AN INVESTIGATION OF ACADEMIC READING SKILLS OF SCIENCE FOUNDATION STUDENTS AT A RURAL UNIVERSITY

by

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Declaration

I, Tsebe Wilfred Molotja, declare that **INVESTIGATION OF ACADEMIC READING SKILLS OF SCIENCE FOUNDATION STUDENTS AT UNIVERSITY OF VENDA** is my own work and that all the sources used or quoted have been indicated and acknowledged by means of complete references and that this work has not been submitted before for any degree or examination committee at any other institution.

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TSEBE WILFRED MOLOTJA DATE

Dedication

I would like to dedicate this study to my wife, Hunadi Natie Molotja, for being the pillar of my strength, taking care of the family while I was busy with the project. To my parents Matome and Macheba Molotja, who gave me the foundation of education, despite going through hardships. Lastly thanks to God, the Almighty for protecting my family during these trying times of my study.

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Abstract

It has been established, through research, that some first-entering science students display levels of under-preparedness for tertiary studies. One area in which this is seen is in students' lack of academic reading ability. Although, some of these students read fluently they do not display competencies in other reading areas, such as to understand, interpret, infer or critique ideas expressed in science academic texts. This low academic reading proficiency has a negative effect on their studies. The aim of this study was to identify, through the National Benchmarking Tests (NBT), the reading competencies of all (100) students registered in the Science Foundation Programme (SFP) in the University of Venda. SFP caters for students who did not attain the required scores in Mathematics and Physical Science. These students' overall scoring, including English competency, is less than the required (26) points, even though they obtained university entrance scores in their Matric Examination. A NBT was used to identify students' reading competencies and based on these results, a reading profile of the students was drawn up and was used to design an intervention strategy to enhance existing competencies and to remedy any shortcomings. To achieve the study's aim, a mixed-method approach was used. The method was predominantly quantitative, because of the statistical aspects of the data from NBT, however, it had some elements of qualitative approach through the use of a case study and the designing of an intervention strategy in response to the profile. The results of the study indicated that the majority of students performed at the basic and lower-intermediate levels. This kind of reading profile means that students on SFP do not possess the academic reading skills needed for them to succeed with their required academic reading activities, without some kind of structured intervention. The design of such a tool (appendix 5) forms the second part of this study.

Key words

Reading abilities, National Benchmarking Test, competencies, under-prepared, academic reading, intervention strategy

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CHAPTER 1: INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION AND BACKGROUND

Reading serves as a vehicle to access knowledge hidden in texts. It is through reading that students of English First Additional language are able to access the wealth of information recorded exclusively in English (Eskey, 2005, p.563). Enright *et al* ., in Weir, Hawkey, Green, Unaldi, and Devi (2005, p.100), describe the reading process as entailing processing beyond the level of searching information and basic comprehension of the main ideas in a text, but also requires an understanding of how information in a text as a whole is connected. Students need reading abilities/skills in order for them to be actively engaged in learning and access academic information from different types of texts. In this regard, the acquisition of reading skills amongst L2 students poses some challenges. Thus, "[m]any learners have difficulties in understanding what they read, in particular, comprehending academic texts" (Lian & Seepho, 2012, p.1).

Nationally, there has been a problem regarding the nature of students admitted at South African Universities. The most common characteristic of these students is their under-preparedness for academic studies (Ralenala, 2003, p.1). Jackson, Parkinson and Meyer (2006, p. 265), point out the problem South African universities are faced with regarding first-entering students. They argue that students in South Africa enter higher education with the lack of a wide range of competencies, which is due to the disparities in secondary education provision (Strydom, Mentz & Kuh, 2010, p. 2). Van Schalkwyk (2008,p.2) describes these students as coming from a language background which can be considered as a deterrent to their studies, as their socio-economic status, cultural background sometimes have a negative bearing on their success in their academic due to their inability to interact in English, the language of teaching and learning, at expected levels. The above situation is also acknowledged by Butler (2006, p.6) and Zulu (2005, p.2) when they state that there is a decline in the academic literacy levels of students who get enrolled in first year at the University of Pretoria. Butler (2006) points out that this problem applies to students at all South African institutions. Chimbganda (2011,

p.1) also adds that the problem is widespread. Students' impoverished background is also acknowledged by Van Schalkwyk (2008) when she states that most of the students in South Africa have an impoverished schooling experience; they are often first generation entrants into higher education who lack generic skills that are deemed necessary for academic success. She (2008, p.5) further describes these students as coming from a lower income group, and to whom generally English is their second language (L2) or even third language (L3). These students have some reading abilities, but they lack the necessary academic reading competencies to efficiently adjust and cope with university studies (Boughey, 2009). The lack of academic reading competencies in students is also related to the nature of training that their teachers receive. In light of this, De Wet (2002, p.1) argues that the poor quality of teacher training manifests through poor teaching. He goes ahead to say that educators in traditional black schools often lack English proficiency that is necessary for effective teaching. In this regard, these teachers lack the English language knowledge and skills to support English language teaching and learning in general, and the sharpening and enhancement of reading skills across the entire curriculum in particular. The problem of teachers' lack of ESL literacy skills is therefore transferred to the students, resulting in students not meeting the challenges of tertiary reading competences (Cliff *et al.,* 2003).

The problem outlined above is also acknowledged by Bharuthram (2012, p.2), who argues that most South African Institutions are currently experiencing a problem of students who enter higher education without the skill or ability to read and write at the level expected of them. They bring along the ability to decode texts, but do not understand what they have decoded. The reason for this situation is that they lack comprehension of academic texts, which is critical for analysis, critical evaluation and synthesis of information from various sources (Bharuthram, 2012, p.2). The reading problem students face is also highlighted by Jackson *et al.,* (2006, p.265) when they say that "the majority of students from all educational institutions have problems with what is traditionally known as "academic literacy."

1.2 PROBLEM STATEMENT

It is as a result of the English second language (ESL) problems that have become so pronounced at higher education that some potential science students are admitted to universities through the Science Foundation Program, under the extended degree program (van Wyk & Greyling, 2008, p. 205; van Schalkwyk, 2008). The Science Foundation Program (SFP) in the School of Mathematical and Natural Sciences at the University of Venda (Univen) caters for students who did not attain the required scores in Mathematics and Physical Science. These students' overall scoring, including English competency, is less than the required (26) points, even though they obtained university entrance scores in their Matric Examination. Most of these students are from diverse areas where there are no adequate resources in schools; hence the transition from high school to university without the necessary academic reading skills becomes a major problem. It is from the researcher's personal experience as being an English teacher for 17 years and being a lecturer for the past five years that he was able to observe the problems facing students regarding academic reading. His observations are that students lack the following component of reading skills as outlined by Grabe, in (Weir *et al.,* 2005, p.105):

- automatic recognition skills
- formal discourse knowledge
- vocabulary and structural knowledge
- identifying central ideas of a text ideas
- inferencing skills
- summarizing skills

These, it can be argued, are vital reading skills required for academic work, and their lack therefore poses a problem for the students. It is also confirmed that first–year students experience a range of challenges when transferring from secondary to higher education (van Dyk & van de Poel, 2013, p.1). Some of these challenges are related to academic reading. As the study is aimed at investigating the problem of academic reading amongst students, it is important to describe the nature of the reading problem among the students in the SFP. Since most of these students come from disadvantaged

background, they are classified as struggling students. Shafie and Nayan (2011, p.6) describe “struggling students” as:

- having a low reading proficiency;

This means that they have limited vocabulary and they are unable to deal with materials which need advanced reading skills.

- being inexperienced readers.

This means that most of the students are not familiar with the structure of academic reading texts. They find it difficult to analyze texts focusing on the text structure, and identifying components of the texts.

- displaying characteristics of surface approach when reading.

This means that students often memorize rather than understand the content of what they are reading. This is not the characteristics needed from university students engaged in academic reading. Students who display this character normally do not interact with the text (Shafie & Nayan, 2011, p.7).

- are not able to relate new ideas with their background knowledge.

The argument put forth by Shafie and Nayan (2011) is that these students are not able to apply different reading strategies in their reading because they do not know many reading strategies and how to use them successfully.

Shafie and Nayan (2011, p.7) describe these students as being unable to respond to questions and answer reading strategies, although they are being exposed to a lot of reading strategies. Students also lack self-confidence, and are labeled as ‘under-prepared’ in acquiring more academic reading strategies. They have problems answering high order level questions and extensive answers. Shafie and Nayan (2011, p.8) argue that these students face difficulties in questions which require their competence in analysis, synthesis and evaluation. These students also struggle with questions which require them to compare and discriminate between ideas, assess value of theories, presentations and to make choices based on reasoned argument.

The researcher believes that through this study, some of the above stated problems of students, as in the foundation programme, may be addressed and their academic reading skills enhanced.

1. 3 RATIONALE FOR THE STUDY

Students admitted at Univen through the extended degree programme need extra time to complete their studies, which also has financial implications for parents, Higher Education South Africa (HESA) and the government. Both local and global literature, Ralenala (2005); Parkinson, Jackson, Kirkwood and Padayachee (2007); Rose, Chivizhe, McKnight, and Smith (2003) affirm that academic reading is a challenge, especially for ESLs. Since this study investigates the academic reading abilities of science foundation students entering the University for the first time, it is geared towards coming up with strategies for the development of the students' reading abilities that can meet both their academic and future needs. In addition, the researcher believes that this study would contribute towards knowledge creation in the area of academic literacy and academic reading in particular.

1.4 OBJECTIVES OF THE STUDY

The main objective of the study is to:

- Analyze academic reading abilities of the SFP students and to design a remedial strategy that can address their identified reading abilities.

Specific objectives:

- Identify SFP students' reading competency levels;
- Design a strategy or activities for enhancing students' academic reading abilities in response to the identified reading competency levels.

1.5 RESEARCH QUESTIONS

The study responded to the following research questions:

- What are the competencies for academic reading?
- What are the academic reading competencies / profiles of students entering the SFP according to the National Benchmarking Test (NBT)?

- What reading intervention strategies / activities can be provided to help students according to their identified academic reading profiles?

1.6 LITERATURE REVIEW

The following sections focused on the relevant literature reviewed on reading theories and on studies conducted related to academic reading, in particular.

Many studies have been conducted on academic reading on students from different linguistic backgrounds. There is a fair amount of research-based literature from both local and international studies which does not only identify the reading capabilities of tertiary students who are studying in their L2 or L3, but also strategies that can enhance such capabilities.

Lian and Seepho (2012, p.12) conducted a study on the effects of metacognitive strategies on academic reading comprehension of Chinese EFL students. Reading comprehension tests, questionnaire and semi-structured interviews were administered to the students. The results of this study indicated a positive increase on students' academic reading comprehension after structured intervention. Lian and Seepho's (2012) study is relevant to this investigation because it involves the application of metacognitive strategies in academic reading. Similarly an assumption is made in this study that metacognitive strategies can lead to the activation of the schema or the background knowledge, which is vital in developing a better understanding of the text.

Another study conducted by Rose *et al.,* (2003) on scaffolding academic reading at the Koori Writing Centre in Australia is also relevant to this investigation. The study was about providing access to tertiary students for indigenous Australians who have historically been excluded from higher education. Most of these students had problems with reading complex academic texts which needed a high level of understanding, and the ability to critically analyse (Rose *et al.,* 2003, p.42).

These students were put through a scaffolding program where they were expected to structure their own essays appropriately using academic conventions, objectives and academic language to demonstrate their mastery of a topic that could inform and influence their readers (Rose *et al.,* 2003, p.42). The results of the study were that there was an improvement in the students' summary writing skills as these students were able to organize their essays, use information from the readings as well as analyze and discuss this information using the objective style of academic language to express their judgments (Rose *et al.,* 2003, p. 47). It was interesting to note that, after the structured intervention, these students were willing to participate in class, express their own opinions, use analytic thinking and develop their arguments (Rose *et al.,* 2003, p.48).The findings also showed that scaffolding can be an important strategy for teaching or equipping students with academic reading competencies.

From a different angle, Hellekjaer (2009) conducted a study examining the English reading proficiency of 578 Oslo (Norwegian) university students. Self-assessment items and an International English Language Testing System Academic Reading module were used to quantitatively measure their reading proficiency. This study was also informed by the several studies which proved that Norwegian students are very good in Basic Interpersonal Communication (BICS), but their Cognitive Academic Language Proficiency skills (CALP) is far low beyond the threshold level. The transferring of skills from the students' home language (Norwegian) to English was slow because of their low threshold level in the second language (English).The conclusion was that Norwegian students have difficulties in reading English textbooks. Some of the reasons attributed to the above finding include poor content knowledge in written English and the lack of study experience. This study is relevant to the current study because the background of students in the SFP is similar to that of the Norwegians.

Sengupta (2002) also conducted a study on how the application of literacy models of L2 reading become explicit through classroom intervention and the ways in which students' awareness impacts on their literacy development. The study was conducted on five groups of L2 learners in a Hong Kong tertiary institution. Lessons were audio-taped and

field notes of all lessons were analyzed. The findings of the study were that there are significant changes in the way tertiary students read compared to their previous approach of word -for-word decoding. Such a study was very useful in the sense that students should be shown how to read selectively and purposefully as well as how to be more actively involved in academic reading.

Another contribution made toward academic reading was the creation of the South African National Benchmarking Test (2010). The results of this test conducted by Higher Education South Africa (HESA) in 2010 showed that of the 13,000 students who wrote the academic literacy test, only 47% fell into the intermediate category while 7% had only basic academic literacy.

One of the studies in evaluating the approach towards reading adopted by first year university students was conducted by Hermida, (2009). The aim of the study was to evaluate whether students took a deep approach or surface approach to reading. The results of the study indicated that a majority of the students took a surface approach to reading. A surface approach to reading is what Weir *et al.,* (2005) refer to as 'expeditious reading'. The surface approach towards acquiring academic reading skills does not lead students into developing academic reading skills (Cliff & Hanslo, 2003; Weideman, 2003).The deep approach to reading is relevant to tertiary students as it requires the activation of their prior knowledge (schemata) (Hermida, 2009, p.22).

Weir *et al.,* (2005) made an attempt, in a study, to determine the reading behaviours and abilities of first-year university students. They used an open-ended questionnaire to elicit information on students' academic reading experiences and difficulties that they may have encountered in reading their courses. The findings from the study indicated a high percentage (50 %) of students engaging in reading their text books and journals. There is however, a low percentage (15 %) of the approaches or abilities employed in the reading of these texts (Weir *et al.,* 2005, p.112). These findings imply that academic reading should be taught to all first-year entering students and in particular those in some South African universities.

A study, similar to the one above was meant to examine the reading processes of a selected group of tertiary students majoring in English Language Studies (Latiff, 2009). A case study method was used looking at the reading behaviours of six ESL readers engaging with a research article. A metacognitive awareness questionnaire was utilised. The results of the study revealed that students relied more on the bottom-up processing strategies, which had negative effects on their understanding of the article. In addition to this, the students also had a problem with different word recognition skills. The study indicated that students did not have the academic reading abilities of being familiar with the genre or vocabulary of the specific text. Their lack of relevant diction of the genre highlighted the need for the deeper approach to academic reading as outlined by Hermida (2009).

Similarly, Yeld in Jackson *et al.,* (2006, p.265) did a comparison of the admission of students in the science first year level in six universities. The findings of the study were that between 40%-55% of science students in some cases have problems with reading, interpretation of material, understanding relations between parts of text and indicators in discourse, among others).

Jackson *et al.,* (2006, p.266) also carried out an evaluation, at the University of KwaZulu-Natal, of the academic literacy course for SFP on all campuses. Questionnaires were distributed to lecturers asking them the type of reading and writing that they expected from their undergraduate students. The outcome was that lecturers expected students to:

- Summarize/indicate reaction to readings
- Write experimental report (laboratory)
- To write research papers

To add to the studies conducted on academic reading, Ralenala (2005) also came up with the difficulties in comprehending science texts by ESL university students at the University of Limpopo. The study was based on the SFP offered at the University of Limpopo. Ralenala (2005) explains that these students come from a diverse background hence the aim is to improve their English for various career choices. He

analyzed factors which make reading a difficult task to students in the science department. One of his acknowledgements is that reading is one of the vital skills used in accessing information from various subjects. His study analyzed different reading models and these serve as the theoretical background for this study.

All the above mentioned studies serve as the epistemological basis for the current research because they identify the expected competencies which students who are at universities are expected to possess.

1.7. THEORETICAL FRAMEWORK

1.7.1 Reading

There are many definitions of reading. The following section focuses on the nature of reading, definitions of reading, and different theoretical backgrounds which inform the reading process.

Reading is defined by Day and Bamford (1998, p.12) as the construction of meaning from a printed or written message. Goodman, in Carrel *et al.,* (1988, p.12) also adds to the meaning-making process of reading by saying that reading is a psycholinguistic process. It is a psycholinguistic process because it involves language and thought. It is the interactive process between a reader and the text (Alderson, 2000, p.3 and Sengupta (2002, p.2). Sengupta (2002, p.2) takes this definition further by saying that reading is an interactive process which includes a complex interplay between local level bottom-up strategies and more global levels of top-down, higher order mental process and background knowledge. Hellekjaer (2009, p.1) concurs with this view by stating that reading is an interactive process between information in a text and the knowledge of the reader. From another perspective, Alderson (2000, p.3) views the reading process as involving ones' thought. He claims that when one reads, one is presumably thinking about what one is reading; what it means to one, how it relates to other things one had read, how it relates to things one knows and also how it relates to what one expects to come next in texts. There is an agreement between Goodman's (1967) and Alderson's (2000) definitions of the reading process. The agreement is in relation to reading being

a process that reflects one's thinking. In addition, reading requires the ability to synthesize, interpret, evaluate, and selectively use information from texts (Grabe, 2009, p. 1).

Kolers, in Kilfoil and Van der Walt (1989, p.6) view reading as a meaning-making activity. Hermida (2009, p.23) furthers this notion by stating that "when reading an academic text, the reader recreates the meaning of the text, together with the author". As a matter of emphasis, Kilfoil and Van der Walt (1989, p.6) extend their definition of reading to "what we see on page is only part of the meaning of a text. The remainder is in the reader himself." This extension reiterates the notion that reading is an interactive process (Alderson, 2000, p.3; Grabe, 2009, p.15). In other words, there is an interaction between the reader's prior knowledge of reading and the current topic area. This interaction also reflects reading as a metacognitive process, which would be discussed later on in this study. In light of this, the interaction between the reader and the text can be referred to as "transaction" Rosenblatt, in Gunning (2010, p.12). He maintains that the text is transformed by the reader and the reader in turn, is transformed by the text.

Based on the views expressed above, reading has to be accessible in content and appropriate genre (Parkinson *et al.,* 2008, p.15).The ability to read depends on whether the reader is conversant with the content and the genre of the reading. Reading at university level depends on the students' acquisition of a set of abilities or skills as categorized by Bloom in his taxonomy of Six Cognitive Levels (*htt://courseweb.lt.unt.edu/gmayes/document/Bloums taxonomy.html*). According to Bloom, there are six levels of cognitive development, which are: knowledge, comprehension, application, analysis, synthesis and evaluation. The acquisition of these cognitive abilities is important because it informs students' success, academically.

As a pathfinder, Carrel *et al.,* (1988, p.1) outline the way that second language teaching or learning situations for academic purposes, especially in higher education in English-medium universities is important. Secondly, other programs that make extensive use of academic materials written in English also show how reading is paramount. This means

that without the reading competencies, students have difficulties in accessing these materials.

Bharuthram (2012, p.2) adds to the importance of reading by stating that reading is one of the most important academic tasks encountered by students. Reading, as such can be viewed as the essence of all formal education, as literacy in academic settings exists within the context of a massive amount of print information (Bharuthram 2012, p.2). It is only through reading that students can access this massive information. The acquisition and possession of reading competencies is thus important to students, hence the purpose of this study.

Since reading involves the application of thought (Arkarsu & Harputlu, 2014), it is important to reflect on the existing relationship between reading and thought. The following sections focus on the relationship between reading and thought and different reading models.

1.7.2 The Cognitive Development Model of reading

Reading is an interactive process which involves metacognitive skills. Different theories of Cognitive development are outlined in this study to show the metacognitive nature of skills involved in reading. The cognitive model of reading is underpinned by the schema theory. The following section would shed more light on what the schema theory is and to show its importance in reading.

1.7.2.1 Schema Theory

A schema is described as the knowledge that a reader brings to text (Alderson, 2005, p.17). This knowledge is already stored in the memory of the reader and functions in the processing or interpreting of new information and at the same time allowing it to enter and become a part of the knowledge stored (Carrel *et al.,* 1988, p. 37). Meaning-making and comprehension can be said to result from the interaction between the existing knowledge and the new knowledge in the text.

Bartlet, in Carrel *et al.,* (1988, p.39) describes schemata as an active organization of past reactions, or past experience. Jing-Tao (2012, p.1) concurs with this researcher by stating that schemata is the reflection or active organization of people's past experience. They are higher–level, complicated and accumulated knowledge structures. In addition to these two, schemata can also be described as interlocking mental structures representing readers' knowledge (Alderson & Bachman, 2000, p.33). Thus, the new information from the text is integrated into the pre-existing schemata. Schemata can be divided into three:

(a) Formal schemata

This is the knowledge of language and linguistic conventions, including knowledge of how texts are organized as well as what the main features of particular genres are (Alderson & Bachman, 2000, p.34). It also involves the ability to process the more complex linguistic structures associated especially with written language.

(b) Content schemata

Content schemata refers to the knowledge of the subject matter of the text. This content schema is divided into background knowledge and subject-matter knowledge. Content schemata refer to the general information on a given topic. Such a knowledge can help students to predict and choose information, rule out different interpretations, accelerate their reading speed, develop their comprehension and to some extent remedy their language defects (Jing-tao, 2012, p.3). Gilakjani and Ahmadi (2011, p.3) allude to the importance of familiarity with the text students read when they assert that "the closer the match between the readers 'schema and the text', the more comprehension occurs." This means that students who are in the science field should have knowledge of content schema of texts in science in order to have more comprehension of any text that they may come across throughout their studies. The schema theory is very important in developing the reading competencies in institutions of higher learning.

Content schemata is therefore important to students because it enables them to make predictions of what to expect from their texts and to confirm their predictions on what is taking place in the text (Gilakajani & Ahmadi, 2011, p.4).

(c) Linguistic schemata

This refers to the extent to which the reader can master the language of the reading material (Jing-Tao, 2012, p.2). The linguistic schema is related to the knowledge of the language as is used in different scientific texts. This means that students should have the knowledge of this scientific language for them to be able to read through different texts.

1.7.2.2 The importance of the schema theory

Carrel *et al., (*1988, p.76) argue that the schema or background knowledge is very important in ones' reading because it helps the reader in constructing meaning. Alderson and Bachman (2000, p.43) views the relevance of content schemata as the knowledge that needs to be activated by the reader or the texts, if it is to be used for accurate understanding. They maintain that any text either spoken or written does not by itself carry meaning. In contrast, the schema theory postulates that a text only provides directions for listeners or readers as to how they should retrieve or construct meaning based on their own previously acquired knowledge. The reader uses his background knowledge to interact with the text in order to comprehend it. This means that for students to be able to comprehend a scientific text, they need to interact or to relate their academic materials to their existing knowledge.

For meaningful interaction between the text and the students' background knowledge to take place, there must be a comprehensible Input from the lecturer and the conducive environment for reading (Krashen, 2007, p.3). In light of this, Carrel *et al.,* (1988, p.70) argue that the input is vital for academic reading. Furthermore, the schema theory guides the process of interpretation which is based on the principle that every input is mapped against some existing schema and that all aspects of that schema must be compatible with the new input information.

The utilization of schemata in the construction of meaning may either make use of the bottom-up or top-down approach. In the bottom-up approach, processing is evoked by the incoming data; the features of the data enter the system through the best fitting, bottom-level schemata. This is because schemata are hierarchically organized from most general at the top to most specific at the bottom. As these bottom-level schemata convert into higher level, ones' more general schemata become activated (Carrel *et al.,* 1988, p.76).

The activation of the top-down approach occurs when the system makes general predictions based on the higher level. This may lead to the general schemata being activated and then searching the input for information to fit into the partially-satisfied higher order schemata (Carrel *et al.,* 1988, p.77).The two approaches described above complement each other in the construction of meaning. The top-down process is the one responsible for high order learning at tertiary institutions (Grabe, 2009, p. 5).

The distinction between the bottom-up and the top-down approaches indicate the schema theory's relevance in reading. It is important that students' background knowledge should be activated for the construction of meaning to take place. Grabe (2009) maintains that there is a relationship between reading and metacognition.

The schema theory as outlined above does not go without criticism. The following discussion focuses on the criticisms against the schema theory.

1.7.2.3 Criticism of the Schema theory

Alderson and Bachman (2000, p.48) argue that the schema theory does not explain how completely, how new information is handled. Moreover, the theory does not explain how the similarities are noticed in the first place although they may be perceived with related information. In this regard, the schema theory does not lead to explicit definitions or predictions of the comprehension process. Instead, it applies only to the study of reading and memorizing. This is based on the argument that the schema theory applies

only to cultural-specific knowledge which may be a hindrance to one who lacks such knowledge (Carrel *et al.,* 1988, p.80).

Contrary to the above view point, Grabe (2009); Alderson and Bachman (2000) do not accept the above criticism of the schemata on face value. Grabe (2009, p.15) debates that even though there are some criticisms, the schema theory is still vital in the academic reading process. It is based on the premise that for reading to be classified as an interactive process, the formal and content schemata are needed for students to comprehend the text .The role of the schema in comprehending a text is better explained when Grabe (2000, p.40) introduces the concept of the text and the situational models of reading where there are applications of the schemata. The researcher also believes that the schema theory is relevant in students' academic reading because prior knowledge plays a pivotal role in one's understanding of a text or situation. In accordance with this thought, the activation of students' background knowledge enhances their comprehension in academic texts which might be more complex, like the ones in science foundation. In SFP, students are expected to interact with various scientific texts, applying their background knowledge related to those texts for comprehension to take place.

The following section focuses on this relationship between reading and metacognition.

1.7.2.4 Metacognition and reading

Ratange (2007, p.25) describes cognition as the mental process involved in acquiring knowledge. Carrel *et al.,* (1998, p.100) view metacognition as:

> Involving thinking about the learning process, planning for learning, monitoring of comprehension or production while it is taking place, and self-evaluation of learning after the language activity is completed. Cognitive strategies are more directly related to individual learning tasks and entail direct manipulation or transformation of the learning materials.

The above quotation involves thinking or the conscious experience of the student which includes thoughts, ideas, convictions, understanding and knowledge.

Alderson and Bachman (2000, p.41) state that there is a relationship between metacognition and reading performance. They maintain that poor readers do not possess knowledge of reading strategies and are often not aware of how or when to apply the knowledge they have (Alderson & Bachman, 2000, P.41). These students cannot infer meaning from surface-level information because they have poorly-developed knowledge about how the reading system works. As such, they find it difficult to evaluate text for clarity, consistency or paucity. There are various approaches which can be implemented when reading texts. The following section deals with these approaches to reading.

1.7.3. Approaches to reading

This section focuses on the text model of reading within the ambit of academic literacy and its range of skills and competencies.

1.7.3.1 The text model of reading.

Grabe (2009, p.40) states that for comprehension to take place, the reader must be conversant with the text structure and the situation of the text. This argument is based on the fact that reading is discipline-specific. In other words, the text of a specific discipline would always differ from those of other discipline. This is meant to suggest that students need to be conversant with text structures of their different genres for them to be able to comprehend various texts.

A text is defined by Halliday and Hasan (1989, p.10) as:

> spoken or written language that expresses meaning. It must be something which is a semantic unit. A text should also be seen as a product and a process. It is a product in the sense that it is an output, something that can be recorded and studied, having a process that can be recorded in systematic terms.

It is in the context of the above definition that a text is seen as a process. It is a process in the sense that it is a continuous process of semantic choice which is a movement through the networks of meaning potential with each set of the choices constituting the environment for a further set. The above definition means that students should be able to express their thinking through writing systematic, meaningful sentences or paragraphs.

Text comprehension involves the combination of information from the currently formed proposition with the active meaning elements that has already been integrated into a network of ideas activated from textual input (Grabe, 2009, p.40). A text model of reading comprehension also requires the use of "bridging" inferences to connect new propositions to the network of already active propositional ideas and relationships (Grabe, 2009, p.40).The newly formed textual propositions are maintained by existing reference to some element or idea in the existing network. It overlaps with already active information providing a direct connection into the network and strengthening the activity of that specific element in the network. The new element may represent extensions of existing information and as such may become linked as part of a supporting network (Grabe, 2009, p.40).

1.7.3.2 The textual comprehension

The textual model of reading may be linked to the schema theory (Carrel *et al* 1988) or the activation of the background knowledge in reading. The combination of the new information with information which already exists is the fundamental principle of the schema theory. What Grabe (2009) is saying here is that students' prior knowledge is a valuable source for their reading. This aspect is also linked to reading as an interactive process. There is an interaction between the new information with what Grabe (2009) refer to as "meaning elements" in the comprehension of texts. The above supposition reiterates the fact that students need to be conversant with the text structure in order to activate their schema relating to the content of the text, for them to be able to construct/make meaning. The construction of meaning also depends on the situation of our reading.

1.7.3.3 Situational model of reading

Based on this, Grabe (2009, p.43) states that when we read a text, we normally bring our own information to the processing of that text. This information includes our understanding of the ways through which discourse is structured. Secondly, it may involve the past instances of reading similar types of texts or the specific knowledge we have from these past reading experiences. The last but not the least, it may involve attitudes towards the text, the author, the emerging situation and the genre.

In view of this, situational model of reading takes into consideration factors that reflect the context, the attitudes of the reader, the reader's prior knowledge and others.

1.7.3.4 Reading as an interactive process

Carrel *et al.,* (1988, p.57) describe reading as an interactive process because it combines textual information with the information a reader brings to a text. Grabe (2009, p.15) sees the interactive process of reading as combining many cognitive processes together at the same time. There is an interaction between the reader and the writer. The text provides information that the author wants the reader to understand in certain ways. The reader also brings a wide range of background knowledge when reading, and she or he actively constructs/makes meaning from the text by comprehending what the writer intends to say and interpreting it in terms of the background knowledge activated by the reader (Grabe, 2009, p.15).

Related to this theory is the Social Development theory of Vygotsky's (1978). He states that children learn language first to meet their social needs and after internalizing the in-put, this would then lead to the development of higher-order thinking and cognitive skills. This is what Vygotsky (1978) refer to as the "Zone of Proximal Development" (ZDP) (Savas, 2009, p.397). The Zone of Proximal Development is described as "the distance between the actual development level as determined by independent problem-solving and the level of potential development as determined through problem-solving

under adult guidance or in collaboration with more capable peers" (Vygotsky, in Savas 2009, p. 397).

The cognitive development of students is related to their performance at the university. Vygotsky's socio-cultural theory of the Zone of Proximal Development is related to the metacognition theories of language learning and teaching. The cognitive development of the students is very important for them to acquire the Cognitive Academic Language Proficiency skills (Cummins, 2009). A student who has reached the Zone of Proximal Development is ready to advance to a stage where he/she can venture into the abstract thinking and higher order activities, maybe with the help of someone who is an expert. This is what Rose *et al.,* (2003); Parkinson *et al.,* (2007) refer to as scaffolding. Rose *et al.,* (2000, p.42) describe scaffolding as "the support that a teacher gives to learners so that they can work at a much higher level than is possible on their own." The relevance of this theory is that students can achieve necessary tertiary reading competencies if they are given the necessary support and intervention strategies and the environment for their studies. This may be true with reading in a situation where the texts are conducive for learning. Students may be scaffolded into what reading is by the lecturer who consistently facilitates the whole process through appropriate activities.

The socio-cultural theory of Vygotsky (1978) is related to Krashen (2007)'s theory of Input Hypothesis. In the Input Hypothesis, Krashen asserts that for language learning to take place, there must be a comprehensible input from sources like the environment and the educator. This input should be higher than what the student already knows (Krashen, 2007; Hellekjaer, 2009, p.3). Krashen's Input Hypothesis is criticized for the part that a student plays. Long, in Savas (2009, p.397) views the Input Hypothesis as not only related to the input from the environment and educator, it must also have input from the students themselves. Students need to be active learners and participants when receiving language input. Only listening to new language structures cannot lead to successful language learning." Long's (1983) criticism of the Input Hypothesis means that students should be actively involved in intensive and interactive reading as described by Carrel *et al.,* (1988). As mentioned earlier, the interactive approach to

reading requires the activation of the schema within the students. The schema's theory is very important for the cognitive development of students and their acquisition of reading skills. Anderson and Pearson, in Carrel *et al.,* (1988, p.37) see the activation of the schema as a scaffolding process of equipping students with academic reading competencies. The activation of the schema, which is part of the students' prior knowledge, enables them to construct meaning from a given text. This schema or prior knowledge interacts with information from the text or context of the text to make meaning (Halliday & Hasan, 1989). The new information is allowed to enter and become part of the knowledge store (Carrel *et al.,* 1988, p. 37). This assumptions presuppose that students should have the necessary linguistic (academic) competencies to cope with tertiary academic challenges.

Although the main focus of this study is academic reading, researchers have always said that reading informs all the other areas of literacies, skills and competencies. Based on this assumption, academic reading should therefore be seen as a sub-section of academic literacy. The following discussion would briefly focus on academic literacy and its various forms.

1.7.4 What is Academic Literacy?

Academic reading belongs to a main branch referred to as "Academic Literacy". Academic Literacy can be defined as the ability to interact with various texts assigned in the university (Braine, 2002, p. 4). Parkinson (2000, p.371) extends the definition of literacy to communicative practices associated with particular uses of both written and spoken forms. In this regard, the definition extends to speaking as well as reading and writing. Braine definition (2004, p.4) concurs with Leibowitz's (2001, p.26) in the sense that academic reading takes place at tertiary institutions, which means that students should have the expected competencies for them to be able to move from one level of tertiary studies to another.

Ratange (2007, p.22) cites Warren (2003) who views academic literacy as a complex linguistic, conceptual and skills resources for analyzing, constructing and

communicating knowledge in a subject matter. In this light, academic literacy (AL) is said to comprise of a variety of discourses with their own conventions and methods of inquiry. These conventions are discipline-specific and context-specific (Parkinson *et al.,* (2007). Students need to show that they belong to an academic culture by producing work that shows clear argument, analytical reasoning, critique and relevance (van Schalkwyk, 2008, p. 23). These include research skills, academic reading and writing skills.

AL is divided into two main branches which are: academic writing and academic reading. The following section deals with academic writing and reading and how they influence each other in the context of academia.

1.7.4.1 Academic reading

Academic reading is defined by Sengupta (2002, p.2) as a complex and multi-level type of reading that is different from other kinds of reading. It is also "reading for in-depth comprehension which requires a special type of reading, demanding a different type of processing in terms of attention, information encoding and retrieval" (Nel & Nel, 2014, p. 34). It is a purposeful and critical reading of a range of academic texts varying in length. This form of reading is demanding for students as it requires certain skills which are not the same as those for ordinary reading.

1.7.4.2 Academic writing

Academic writing is described as any writing that fulfills a purpose of education in a college or university context (Thaiss & Zawacki, 2006, p. 4). The above definition indicates that academic writing is context-driven. This means that students may be writing in response to an academic assignment or professional piece. Wingate, (2009, p. 57) sees academic writing as an area widely recognized as a decisive factor for students' retention and progression. What Wingate (2009) means is that if students are not conversant with the academic writing in their disciplines, they may find it difficult to progress to the next level.

The achievement of the component reading skills, as outlined by Grabe (1991) in Weir *et al.,* (2005, p.105) links with academic writing. For students to be able to have a knowledge of formal discourse, vocabulary and structural knowledge and summarizing skills, they should know how texts are academically written since all of the above are inherent in academic writing.

Academic discourse refers to what Parkinson *et al.,* (2008, p.13) term as discourse community. This means that academic literacy is subject/discipline-specific (Parkinson *et al.,* 2008).The language, for example, as used in the science discipline cannot be the same as the language used in commerce. Parkinson *et al.,* (2008, p.13) argue that academic literacy in science involves "learning of science and acting as member of the community of people who do so." Therefore, students should be used to the scientific texts in order to produce new texts. This means that students should be familiar with the scientific environment as well as engage in scientific texts so as to produce new science texts. They must collect, analyze and write about real scientific data.

The description of what academic literacy is relates to the new dimension of academic literacy referred to as "new literacies". The new literacies theory sees literacy as being socially embedded (Abdalla, 2011, p.14). This means that academic literacy in the sciences should be specific to the language of science as outlined by Parkinson *et al.,* (2008).

1.8. RESEARCH DESIGN AND METHODOLOGIES

The following section focusses on the research design and the methodology applied in the study.

1.8.1. Methodology

The method used in conducting this study is the mixed one (qualitative and quantitative) approach. The mixed method approach is defined by Johnson and Unwuegbuzie (2007, p. 123) as "a type of a research in which the researcher or team of researchers combine

elements of qualitative and quantitative research approaches (e.g. use of qualitative and quantitative viewpoints, data collection, analysis, inference, techniques etc.) for the broad purposes of breadth and depth of understanding and corroboration." The researcher acknowledges that the study is dominantly quantitative, because of the statistical aspects of the data from NBT. It however, has some elements of qualitative approach through the use of a case study and the intervention strategy. It is hence, through a quantitative methodology that the profiles of the Science Foundation students were established in detail, and using a case study approach, the articulated characteristics of these students were attended to in the form of intervention exercises. These exercises therefore were directed at addressing the identified characteristics and the sub-domains as per the NBT. The data (statistics) from the NBT (quantitative) informed the design of the intervention strategy, which forms the second part of this study.

1.8.1.2. Data collection

The quantitative data collection instrument used in the study was a National Benchmarking Test. The National Benchmarking Test was sought from the University of Cape Town and administered by the officially-appointed personnel within the Vhembe region, Limpopo Province. An official appointment was set with the Director for NBT testing at the University of Cape Town. Permission was given to administer the NBT at University of Venda (see annexure 1). Only the Academic Literacy part of the test was administered to the students. The aim of the test was to determine the profiles of the students in terms of their academic literacy competencies. These are described as basic, intermediate and proficient (NBT report 2014). The test scripts were collected by the appointed invigilators and couriered back to the University of Cape Town for processing. The process followed to administer the test indicates the credibility and reliability of the test since only the appointed professional people were involved in its administration.

1.8.1.3 Population and Sampling

Hundred first-year students registered for the English Foundation module in the SFP were purposively sampled for this study. Sampling is described by Babbie and Mouton (2002, p.164) as a process of selecting sources of data. Sampling is important because it helps the researcher to focus on specific aspects / participants of the study, rather than the whole. The researcher applied purposive sampling for this study.

1.8.1.4 Data Analysis

The results of the NBT test were analyzed by the University of Cape Town using the SPSS system. Using a case study approach, results were presented through tables and figures and discussed. A detailed analysis of the results in relation to the domains of the NBT and possible structured intervention strategies were also provided here.

1.8.2 Ethical consideration

The researcher negotiated entry into the field with the Head of Department of SFP. Permission was also sought from the Dean of the School of Mathematics and Natural Sciences who was responsible for the Department (see annexure 2 and 3). Permission from the students to participate in the study was also sought (see annexure 4). They were informed about the voluntary participation, issues of confidentiality and indemnity in carrying out the study.

1.8.3 Reliability and Validity

Validity is described by Babbie and Mouton (2002, p. 122) as “the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration.” Validity is important as it guarantees that any results from the study would be true. Mackey and Gass (2005, p.106) also agree with Babbie and Mouton (2002) by stating that validity deals with the reflection we expect from a study as well as contributing meaningfully to the entire investigation.

Reliability is “whether a particular technique, applied repeatedly to the same project, would yield the same result each time” Babbie and Mouton (2002, p.113). The NBT is

described as both valid and reliable. It is applied in most of the universities. There are about 17 universities in the country that are using the NBT for admission purposes.

1.8.4 Delimitations

Only one section of academic literacy was studied, which is academic reading. The study also only involved first-year students admitted in SFP.

1.9. DEFINITION OF CONCEPTS

Academic literacy

Academic Literacy is defined as the ability to read and write various texts assigned in the university (Braine 2002, p. 4). Hugo (2003, p.1) describes literacy as traditionally referring to reading and writing which are complex cognitive activities consisting of many levels of interactive processes. Van Schalkwyk (2008, p.18) views academic literacy as a term used loosely, depending on ones' field of specialization. It varies from one discipline to another. Applied to the discipline of science, academic literacy will then dictate that students must be acquainted with language used in science.

Academic reading skills

These are the skills that students should possess which can enable them to succeed with the academic demands of courses at the universities. Academic reading skills are also referred to as 'metacognitive reading skills' (Pammu, Amir & Masuum, 2014, p.41).

Academic texts

These are texts students encounter throughout their studies at tertiary institutions.

Bottom-up reading strategies

These are the strategies students use to make meaning from a text. They rely on information from the texts which is then incorporated into the students' background knowledge to make meaning.

CALP

This is an acronym which stands for Cognitive Academic Language Proficiency. It is the type of language students are exposed to and supposed to produce when reading academic texts. They are the skills needed for students to succeed in content areas such as reading, writing, mathematics, social sciences, natural sciences and business (Ralenala, 2003, p.109). Cummins (2009) describes CALP as involving the application of higher order thinking skills.

Discourse

Van Schalkwyk (2008, p.25) refers to discourse as the discourse knowledge (concepts) of the area of specific discipline. It is the ability to understand the text structure and the cues that knit discourse and signal sequences in texts (van Wyk and Greyling, 2008, p.3).

Genre

Cheng (2006, p.77) defines 'genre' as "the abstract, goal–oriented, staged and socially recognized ways of using language delimited by communicative purposes, performed social interactions within rhetorical contexts, and formal properties**"** (Negretti & Kuteeva, 2011,p.96). Genre can then be described as structured communicative events engaged in by specific discourse communities whose members share broad communicative purposes (Cheng, 2006, p.77). Tertiary students should be exposed to different genres, especially science genres to acquaint themselves with them.

Metacognition

Metacognition is described as one's knowledge concerning one's own cognitive process and outcomes or anything related to them. These cognitive processes involve thinking or conscious experience and may include thoughts, ideas and convictions, understanding and knowledge (Pammu, Amira & Maasum, 2014, p.2; Iwai, 2011, p.2). Carrel, Gajdusek & Wise (1998, p.100) view metacognition as the utilization of strategies which involve thinking about the learning process, planning for learning and monitoring of comprehension or production while it is taking place. It may also include

self-evaluation of learning after the learning activity. The above explanation means that students should be aware of their reading processes and when they should apply their thinking strategies for meaningful academic reading to take place.

New literacies

This is a multiplicity of practices that are embedded in particular social circumstances and whose acquisition take place in specific to particular cultural contexts (Jackson, Meyer & Parkinson, 2006, p.261).

National Benchmarking Test (NBT)

This is a test administered to students to determine their academic readiness. It was formulated by the lecturers from the University of Cape Town and were commissioned by Higher Education South Africa (HESA). The NBT reflects almost ten years of research and collaboration among leading content specialists and researchers from Institutions of Higher Education across South Africa. The NBT Project is managed by the Alternative Admissions Research Project in the Centre for Higher Education Development at the University of Cape Town.

The NBT is an assessment of prospective first year applicants into Higher Education. The assessments are designed to measure a writer's levels of proficiency in Academic Literacy, Quantitative Literacy and Mathematics as related to the demands of tertiary study. The NBT also provides information to assist in the placement of students in appropriate curricular routes (for example, regular, augmented, extended, bridging or foundation programmes). It also helps with the development of curriculum for Higher Education programmes and assists Higher Education to interpret school-leaving results, such as those of the National Senior Certificate (NSC).

Reading

Reading is the construction of meaning from a printed or written message. It is also described as a psycholinguistic process. It is a psycholinguistic process as it involves language and thought (Goodman, 1997). It is an interactive process between a reader

and the text .Reading is an interactive process which includes a complex interplay between local level bottom-up strategies and more global levels of top-down, higher order mental process and background knowledge (Grabe 1991; Solak & Altayi, 2014).

Scaffolding

This is the assistance that adults and more competent peers provide during learning episodes. It can take place in the form of clues, reminders, encouragement, breaking down the problem into steps, providing examples, or anything else that allows the student to grow independently as a learner.

Schema

This is the students' background knowledge related to what they read. It depends on whether students use the bottom up reading strategies or the top down reading strategies.

Science Foundation Programme (SFP)

This refers to the foundation programme offered to some first-entering students who are registered for science degrees at the University of Venda. The Science Foundation Program (SFP) in the School of Mathematical and Natural Sciences at the University of Venda (Univen) caters for students who did not attain the required scores in Mathematics and Physical Science. These students' overall scoring, including English competency, is less than the required (26) points, even though they obtained university entrance scores in their Matric Examination.

Theory

Tracey and Morrow (2006, p.20) refer to a theory as "a set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted". The above definition refers to the theories of reading which were reviewed in this study.

Top-down reading strategies

These are the strategies students use by making use of their background knowledge stored in their memories to relate with a text. The students 'background knowledge is brought into the text to make sense of the text.

Under-preparedness

This describes students who are entering the tertiary institutions without some requirements for their chosen field of study. It is argued that students in South Africa enter higher education without a wide range of competencies which are due to the disparities of secondary education provision in the country. These students, it is believed will encounter challenges with their academic studies during their transition period from high school to university (Strydom, Mentz & Kuh, 2010). Evens (2002) also allude to the fact that most of the students entering tertiary institutions are underprepared.

1.10 CHAPTER OUTLINES

Chapter 1: Introduction and background

This chapter outlines the whole research proposal from the introduction to the conclusion. It also gives a brief background to the problem in the study. In addition, it articulates the problem statement, literature review, research design, research methodology, data collection instruments, data analysis and limitations to the study.

Chapter 2: Literature review

Chapter 2 outlines different concepts related to reading and academic literacy. The theoretical framework which serves as the backbone to the study is explored in this chapter as well. Finally, different reading theories like the schema theory, the metacognitive process of reading, the nature of reading, and the link between academic reading and academic success are also explored.

Chapter 3: Research methodology

The chapter focuses on the methodology that was adopted in the study. The mixed-method approach was deemed to be effective to get both quantitative data on the profile of the students and use a case study (qualitative) to design an intervention activities based on the identified profile.

Chapter 4: Data analysis and presentations

This is the data presentation and analysis chapter. In this chapter, the results of the NBT were analyzed based on the themes on academic literacy competencies as outlined in the literature review in chapter 2. The analysis of the results informed the design of an intervention or a reading programme for the SFP.

Chapter 5: Discussion of findings

This chapter discussed the results from the study based on the literature reviewed in chapter two, the NBT results and reading subdomains.

Chapter 6: Conclusion and recommendations

In this chapter, conclusions and recommendations are drawn from the data discussed in chapter 5. Recommendations for further studies are also suggested for future researchers. In the conclusion section, the chapter summarized the literature behind academic reading and studies conducted previously on academic literacy. It also gave the implications of the results, outlined the intervention strategy the chapter ends with recommendations for future studies, limitations and a summary.

CHAPTER TWO: LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter presented the background to the problem faced by students relating to academic reading at South African universities. The following sections focusses on reading and the different theories of reading. In addition, it dealt with selected literature and studies on academic reading and on academic literacy. The implications of reading theories to academic literacy and academic reading at universities are drawn.

2.2 READING

There are many definitions of what reading is. The following section focusses on the definition of reading and reading models which influence the reading process, and reading styles. Finally, the section focuses on how academic reading is related to the sciences.

2.2.1 Definition of reading

Reading is defined by Day and Bamford (1998, p.12) as the construction of meaning from a printed or written message. Goodman, in Carrel *et al.,* (1988, p.12) also adds to the meaning-making process of reading by stating that reading is a psycholinguistic process. He states that reading is a psychological process because it involves the interaction between language and thought. Both the reader's linguistic competence and the thinking process are essential towards meaning-making. This act of reading becomes an interactive process between the reader and the text (Alderson, 2000, p.3; Sengupta, 2002, p.2; Gilakjani & Ahmadi, 2011, p.2). In line with the foregoing argumentation, Sengupta argues that reading is an interactive process which includes a complex interplay between local level bottom-up strategies and more global levels of top-down, higher order mental processes and background knowledge. However, Alderson (2000, p.3) views "reading as a complex process of sampling the text for graphic cues, predicting grammatical structures and meaning, confirming the validity of the hypothesis advanced and correcting the hypothesis as necessary as text sampling

proceeds" (Alderson, 2000, p.10). He sees the reading process as involving ones' thought. He claims that when one reads, "the reader is presumably thinking about what he/she is reading; what it means to him or her, how it relates to other things he/ she had read, to things he/she knows, to what he/she expects to come next in texts like this."

There seems to be some congruency between Goodman's (1997) and Alderson's (2000) definition of reading. The agreement is in relation to reading being a process to reflect on one's thinking. In this light, reading requires the ability to synthesize, interpret, evaluate, and selectively use information from texts (Grabe, 2009, p. 1).. For the interpretative process to take place, one has to think about what he/she has read. In this sense, thinking is therefore part of academic literacy which is related to reading, writing and speaking (Heath, in Parkinson, 2000, p.371).

From another perspective, Goodman (1982) has a different view regarding the process of reading. He views reading as depending on the three main types of knowledge: semantic (knowledge of the meaning of words), syntactic (knowledge of the structure of the language) and graphonic (knowledge of the sound-letter correspondence).

The knowledge of the above textual features, Goodman thinks, can enhance the reading process in students. Ralenala (2005, p.77) argues that reading "is not just a supportive tool for learning, but it is the very process through which university learning takes place." The act of reading is related to students' background knowledge. What students already know is part of their background knowledge. This background knowledge is what Carrel *et al.,* (1988) refers to as Schemata. The view on schemata is that reading should be seen as an interactive process which requires the activation of the schema within the student. It is the student's schema about the topic which helps him or her in making meaning from the text. Based on the above assertion, the schema theory is therefore important for the cognitive development of students and the acquisition of reading skills. Thus, Anderson and Pearson, in Carrel *et al.,* (1988, p.37) see the activation of the schema as a scaffolding process for equipping students with academic reading competencies. The activation of the schema, which is part of the

students' prior knowledge, can enable students to construct/make meaning from the text. The schema or prior knowledge interacts with information from the text or from the context of the text to make meaning (Halliday & Hasan, 1989). The new information is then allowed to enter the database and become part of the knowledge stored (Carrel *et al.,* 1988, p. 37). (More on schema theory in the next section).

From a different angle, Kolers, in Kilfoil and Van der Walt (1989, p.96) views reading as a meaning-making activity. He simplifies his definition by stating that what we see on a page is only part of the meaning from a text. The remainder is in the reader himself. This extension is in line with the notion that reading is an interactive process (Alderson, 2000, p.3). There is an interaction between the reader's prior knowledge of reading and the topic area. This interaction also reflects on reading as a metacognitive process which would be discussed later on in the study. Such an interaction between the reader and the text is referred to as "transaction" (Gunning, 2010, p.12).He maintains that the text is transformed by the reader and the reader in turn, is transformed by the text.

2.3. THEORIES OF READING

There are many theories of reading applied in the reading of science texts. Schema theory is one of these theories. The following discussions focus on the different theories of reading.

2.3.1 Schema Theory

The schema theory was developed by Bartlet, in 1932. Bartlet (1932) suggests that "our understanding of the world is formed by a network of abstract mental structures." Based on such an understanding, these metal structures are formed through our interaction with the world which then form part of our experiences. In light of this, the mental structures can be described as the knowledge that a reader brings to text (Alderson & Bachman, 2000, p.17). This knowledge is already stored in the memory (Ajideh, 2003, p.4) and functions in the process of interpreting new information by allowing it to enter and become a part of the knowledge stored (Carrel *et al.,* 1988, p.37; Tracey & Morrow, 2006, p.205). The schema is used in the prediction of our interpretation of texts. Seen

through this lens, meaning-making and comprehension processes result from the interaction between this knowledge and the new knowledge in the text. Tracey and Morrow (2006, p.206) emphasize this principle by stating that students need adequate background knowledge on the subject of the reading text to be able to comprehend the text.

Thus, schema is, according to Ajideh (2003, p.4), a hypothetical mental structure for representing generic concepts stored in the memory. These mental structures are important in students' academic reading because they serve as the background which activates their knowledge on the concepts taught in various content subjects. Students are then able to expect or to predict aspects in their reading, relating to the subject matter. The schema, therefore serves the purpose of activating the knowledge structure that is stored in the memory.

In addition to the view expressed by Ajideh (2003), Pardede (2010, p.3) views the schema theory as outlining how the learner's background knowledge interacts with the academic reading tasks. It further indicates how students' knowledge and previous experience with the world is important in deciphering a text.

Considering the above assertion, Bartlet, in Carrel *et al.,* (1988, p.39) describes schemata as an active organization of past reactions, or past experiences. These past reactions and experiences are activated through the reading process; there is therefore an interaction between thought and language. In the same thought, Ajideh (2003, p.2) states the importance of what the reader brings to the reading task as a formidable amount of information and ideas, attitudes and beliefs.

Fig 2.1.The schema model of reading (Bilokcuoglu 2014)

The above diagram (schema model) represents the stages through which students go when applying their schema. Based on it, students activate their background knowledge when reading through concepts which are in the academic texts. They therefore apply reading strategies which enhance their understanding of these concepts.

Viewed in this light, schemata are, according to Alderson and Bachman (2000, p.33), an interlocking mental structures representing readers' knowledge. The new information from the text is integrated into the pre-existing schemata. Schemata can be divided into two:

2.3.2 Types of schema

Formal schemata

This is the knowledge of language and linguistic conventions, including knowledge of how texts are organized and what the main features of particular genres are (Alderson & Bachman, 2000, p.34). In addition to the above, Hedge and Ferris (2009, p.59) view formal schemata or linguistic schemata as providing the most basic threshold when beginning to read a text. Pardede (2010, p.4) observes that students should not only be familiar with the text structures, but should also be conversant with different structures peculiar to different genres. They should be familiar with the structural organization of different scientific texts. The fact that linguistic schemata is the basic or

foundation of reading in science (Hedge and Ferris, 2009), means that students should be familiar with the language in science texts for them to be able to read and comprehend those texts. If students do not have the necessary linguistic schemata, they may experience comprehension breakdowns when reading through science texts. It is therefore, from the linguistic schemata that students may be required to have knowledge about the content of their texts, which is referred to as 'content schemata'.

Content schemata

Content schemata refers to the knowledge of the subject matter of the text. Galakjani and Ahmadi (2011, p.2) define content schema as the student's familiarity with the subject matter of the text. This may include an understanding of the topic of the text and the cultural-specific elements needed to interpret it. Content schema forms part of the individual's cultural orientation and since culture affects all aspects of life, it certainly has a major impact on all elements of reading. Zarrati, Nambiar and Maasum (2013, p.2) explain the usage of the content schemata as "constructing a meaningful mental representation of a text and the usage of structural information to help organise the content, thus facilitating the process of meaning-making of a text".

Zarrati *et al., (*2013, p. 54) add to the importance of the knowledge of text structure by stating that students should also be acquainted with the expository text structure. The expository texts structure is richer in rhetorical structures that organise information in a way which is beneficial for students' reading. In this regard, Anderson and Pearson (1984) view the schema theory as beneficial because reading focuses on the role of schemata, knowledge stored in memory, and in text comprehension. They also believe that comprehension is the interaction between old and new information and the already-known general ideas subsume and anchor new information.

In addition to the types of schema above, Tracey and Morrow (2006, p.70) outline the following as processes involved when one's schema is activated during the reading process:

- **Accreditation**

This is the stage during the activation of the students' schema where they take in new information without changing anything in their existing schema.

- **Tuning**

This is the stage during the activation of the schema where an existing schema is modified to incorporate new information.

- **Restructuring**

During this stage, a new schema is created by the learner because the old one is no longer sufficient. Tracey and Morrow (2006, p.70) refer to restructuring as a situation where a new schema is created by the learner because the old one is no longer sufficient. Restructuring is important in academic reading because it equips the students with the compensatory skills to be applied when other academic reading skills fail.

2.3.3 The importance of schema theory

The schema theory is important for academic reading as, research has proven that it leads towards the activation of the students' background knowledge. Schemata are hierarchically organized with the most general at the top to most specific at the bottom. As these bottom-level schemata convert into higher level, more general schemata become activated (Carrel *et al.,* 1988, p.76).

It is necessary that students' background knowledge be activated for the construction of meaning to take place. Background knowledge or prior knowledge is described by Evens (2002, p.72) as a significant factor involved in filtering input data and determining what would be perceived. Bartlet, in Ajideh (2003, p.4) refers to this as a "constructive process." He also states that this constructive process uses information from the encountered discourse, together with knowledge from the past experience related to the discourse at hand to build mental representation. The mental representation is what is important for students to be able to succeed in their academic studies. This is based on the understanding that it helps them in formulating images

related to their reading which may enhance their understanding. They need to be able to activate the background knowledge of the content and link it to their current studies.

The activation of the schema in the reader is a metacognitive process and depends on stimuli that the reader receives from the context. This activation may follow the following two ways as stated by Evens (2002):

- new information from the outside world can be cognitively received and related to already-known information stored in memory through retrieval or remembering.
- new information can be represented by new mental structures. This means that if there are no schema structures available, the new information acquired then becomes the new schema.

The significance of schema in students' reading is also emphasized by Carrel *et al.,* (1988, p.76) when they argue that the schema or background knowledge helps the reader in constructing meaning. For emphasis, Alderson and Bachman (2000, p.43) also add to the importance of content schemata by stating that knowledge needs to be activated by the reader of the texts if it is to be used for accurate understanding. They maintain that the text, any text either spoken or written, does not by itself carry meaning. Rather according to the schema theory, a text only provides directions for listeners or readers as to how they should retrieve or construct meaning from their own, previously acquired knowledge. The reader in this situation uses his/her background knowledge to interact with the text to comprehend it. Anderson and Pearson (1984) see schema as an important aspect of the reading process in enhancing students' academic reading skills, their decoding, skimming, scanning, inference and summarizing skills. This means that for students to be able to comprehend their scientific texts, they need to interact or to relate their textual materials to their own knowledge, making use of these above mentioned skills. Tracey and Morrow (2006, p. 69) view the schema as important in ones reading because the more knowledgeable a student is on the topic , the more easily he or she will be able to learn new information on that topic.

The schema theory, as outlined above, does not go without criticism. The following are some criticisms against it.

2.3.4 Criticism of the Schema theory

Alderson and Bachman (2000, p.48) outline the following as criticisms against the schema theory.

- it does not explain completely how new information is handled.
- it does not explain how the similarities in new information are noticed in the first place, although they may be perceived with related information.
- it does not lead to explicit definitions or predictions of comprehension process.
- it applies only to structured reading and memorizing.
- schema theory applies to cultural-specific knowledge which may be a hindrance to one who lacks the cultural knowledge of field (Carrel *et al.,* 1988, p.80).

Grabe (2009, p.15) argues that for reading to be classified as an interactive process, the formal and content schemata need to be at work in the reader's attempt to comprehend the text .The role of the schema in comprehending a text is amplified by Grabe (2000, p.40) who introduces the concept of text model and the situational model of reading. In both models, there are applications of the schema.

For meaningful interaction between the text and the students' background knowledge to take place, there must be a comprehensible input from the lecturer and conducive environment for reading (Krashen, 2007, p.3).Students should be equipped with strategies to interact between the existing knowledge and the new knowledge. Carrel *et al.,* (1988, p.70) argue that the input is very important based on the schema' position that the process of interpretation is guided by the principle that every input is mapped against some existing schema and all aspects of that schema must be compatible with the input information.

In view of the above, it might be necessary to shed some light on what the bottom up and top down strategies to reading are in relation to the activation of schemata. The schema theory is relevant to the bottom-up or top-down approaches to reading because students apply their schema to the content of the texts either when applying either approaches or individual ones. This means that the schema theory is applicable to either the bottom-up strategies or the top-down approach. Students may apply their background knowledge to a text when applying their top-down strategies, or use the textual cues from the text to activate their background knowledge.

2.4 Metacognition and reading

Ratange (2007, p.25) describes cognition as the mental process involved in acquiring knowledge through reading. Mobalegi and Saljooghian (2012, p.1) agree with the above description of metacognition as the:

> mental operations relating to how readers perceive a task, what textual cues they attend to and how they make sense of what they are reading, and what to do when they do not understand.

The quotation above reflects Flavell's, view (in Iwai, 2011, p.1), who defines metacognition as "one's knowledge concerning one's own cognitive process and outcomes or anything related to them" (Sen, 2009). These cognitive processes involve thinking or conscious experience and include among other things thoughts, ideas and convictions, understanding and knowledge. Metacognition also refers to:

> the active monitoring and consequent regulation and orchestration of these processes in relation to the cognitive objects or data on which they bear, usually in the sense of some concrete goal or objective (Iwani, 2011, p.1).

Sen (2009, p.12) argues that students should know and be able to control their own thinking processes in line with learning activities. Similarly, Magogwe (2013, p.2), views metacognition as behaviours undertaken by the learners to plan, arrange, and evaluate their own learning. Tabatabaei and Assari (2011, p.206); Negretti and Kuteeva (2011, p.23) agree with Pammu, Amir and Maasum (2014, p.2) that metacognitive reading

strategies are self-regulating thoughts that monitor cognition while cognitive strategies process the language for the task. In view of the above, metacognition processes are therefore very important across the whole tertiary curriculum and an emphasis on metacognition needs to accompany instruction in tertiary academic disciplines (Zohar & Dori, 2012, p.1).

To augment the above assertion, Grabe and Stoller, in van Wyk and Greyling (2008, p.208), view metacognitive awareness as including: monitoring one's understanding; locating the source of any comprehension breakdowns (language, background knowledge, thinking or just poorly-written text) and repairing the breakdown

Touma (2012, p.91) provides a brief summary of the activities that researchers have found the metacognitive skills of reading to include:

- clarifying the purposes of reading (understanding the task demands, both explicit and implicit);
- spontaneously making use of relevant background knowledge;
- allocating attention so that concentration can be focused on the major content at the expense of trivia;
- critically evaluating content for internal consistency and compatibility with prior knowledge and common sense;
- monitoring ongoing activities to see if comprehension is occurring, by engaging in activities such as periodic self-review;
- drawing and testing inferences of many kinds including interpretations, predictions, and conclusions;
- criticizing, refining, and extending newly acquired knowledge by imagining other uses of the information or counterexamples to the arguments.

Additionally, Carrel *et al.,* (1998, p.4), see the metacognitive awareness of academic reading strategies in the same light as Yuksel and Yuksel (2012, p.1). All these researchers view metacognition strategies as involving thinking about the learning process, planning for learning, monitoring of comprehension or production, while it is

taking place, and self-evaluation of learning after the language activity is completed. The same views are expressed by Elosua *et al.* (2013, p.5) who think that metacognitive strategies are routines and procedures that allow individuals to monitor and assess their ongoing performance in accomplishing a cognitive task. This means that students' awareness of the above metacognitive strategies can enhance their chances of being academically successful. Cognitive strategies are more directly related to individual activity learning tasks which entail direct manipulation or transformation of the learning materials. Such strategies include directed attention and self-evaluation, organization, setting goals and objectives, seeking practice opportunities, and so forth. The fact that reading is an active, constructive, and meaning-making process (Lian & Seepho, 2012, p.1) shows how the application of the metacognitive reading strategies can enhance student's reading. With this in mind, students have to be actively involved in their reading activities to become aware of the reading process. Metacognition plays an important role in one's awareness and control of the reading process. The above situation dictates that students need to be aware of the metacognitive reading strategies as this awareness generates more constructive and responsive reading tradition among students (Pammu, Amir & Maasum, 2013, p.2). It is important for students to understand metacognitive strategies because these strategies enhance student's mental processes which are directly concerned with the processing of information in order to learn, obtain, store and retrieve information (Pammu *et al.,* 2013, p.2). It should support better integration of propositions and better text comprehension by science students (Lefebvre & Lories 2004, p.1). Being aware of ones' reading, according to van Wyk and Greyling (2008, p.4), refer to:

- monitoring one's understanding.
- locating source of any comprehension breakdowns.
- repairing any breakdowns.

Alderson and Bachman (2000, p.41) state that there is a relationship between the metacognition and reading performance. They maintain that weak readers do not possess knowledge of strategies. That is to say, they are often not aware of how or when to apply the knowledge they have (Alderson & Bachman, 2000, p, 41). These

weak students cannot infer meaning from surface-level information and if they do, they will have poorly-developed knowledge about how the reading system works. This in turn can make it difficult for them to evaluate text for clarity, consistency and plausivity. There is therefore a dire need to provide disadvantaged students with the metacognitive reading strategies in order for them to successfully operate within a wider spectrum of academic reading. Evans (2002, p.65) shows the importance of metacognitive strategies as "a starting point for improving learning in all domains and for developing the initial processes used in writing." What Evens (2002) means is that students like those on SFP have academic reading skills which may be enhanced by engaging them in metacognitive activities. Magogwe (2013, p.1) stipulates the difference between poor readers and skilled readers by observing that "skilled readers often engage in deliberate activities that require painful thinking, flexible strategies, and periodic self-monitoring". These strategies can only be acquired if students have the metacognitive reading strategies which lead to active reading in students.

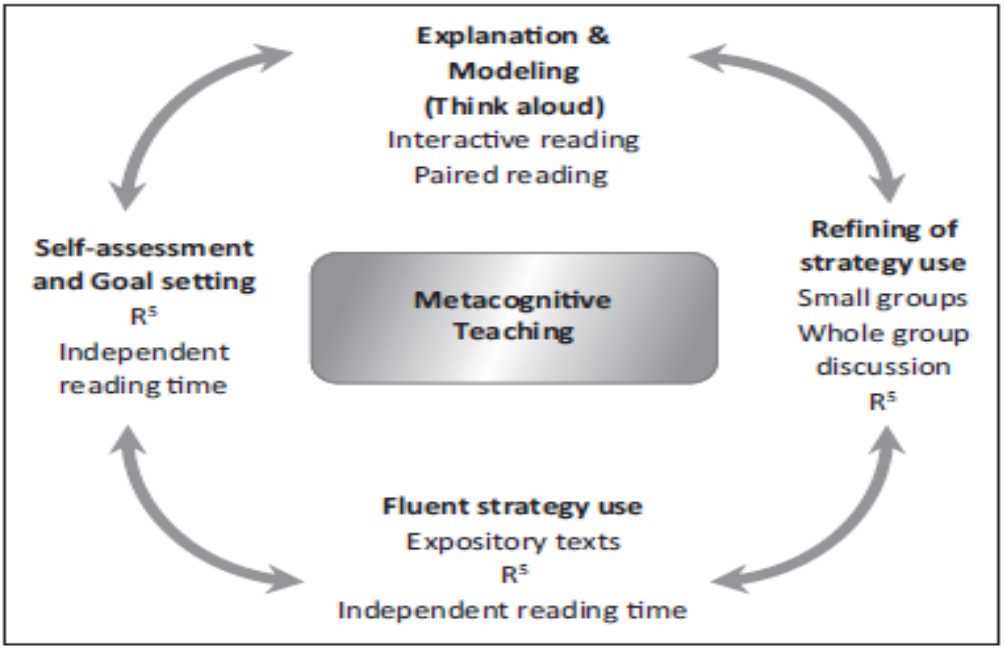

Fig 2.2 Metacognitive Teaching Framework (adapted from Kelley, M and Clausen-Grace, N.2007)

Favell, in Iwai (2011, p.3) argues that metacognition has three clusters which are important for academic reading. They are:

2.4.1 Planning

These are strategies used before reading which involve activating learners' background knowledge to get prepared for reading (Iwani, 2011, p.4). They involve previewing a title, picture, illustration, heading, or subheading of the text. This helps the reader to grasp an overview of the text and to preview general information in the text and its structure. Learners may check whether their reading material has a certain text structure, such as cause and effect, question and answer, and compare and contrast, setting the purpose for the reading.

2.4.2 Monitoring strategies

These are strategies which occur during the reading stage (Iwani, 2011, p.3). They involve aspects like comprehension, vocabulary recognition, self-questioning, summarizing, inferring the main idea of each paragraph, identifying key words. These activities mainly take place during the reading process.

2.4.3 Evaluating stage

These are employed after reading, for example, learners may think about how to apply what they have read to other situations.

The metacognitive reading awareness strategies may be illustrated diagrammatically as follows:

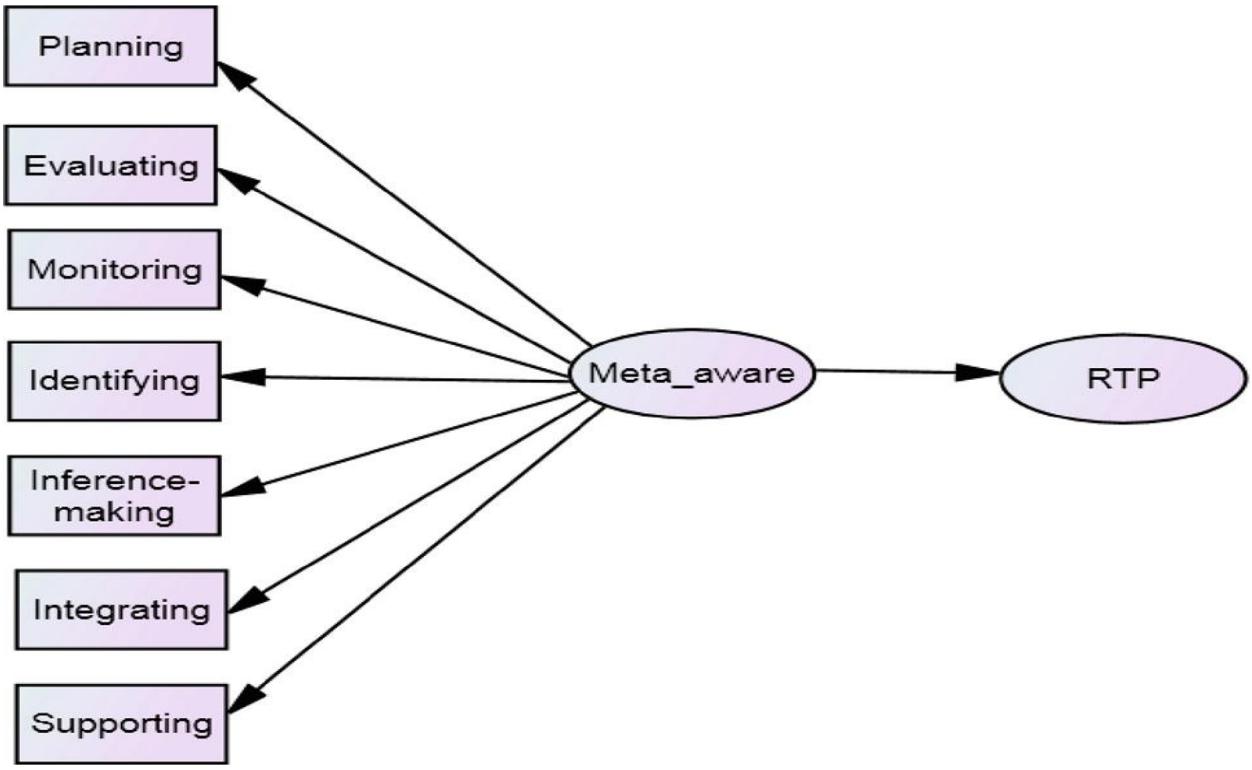

Fig.2.3 *Modelling test takers' strategy used in reading comprehension tests.*

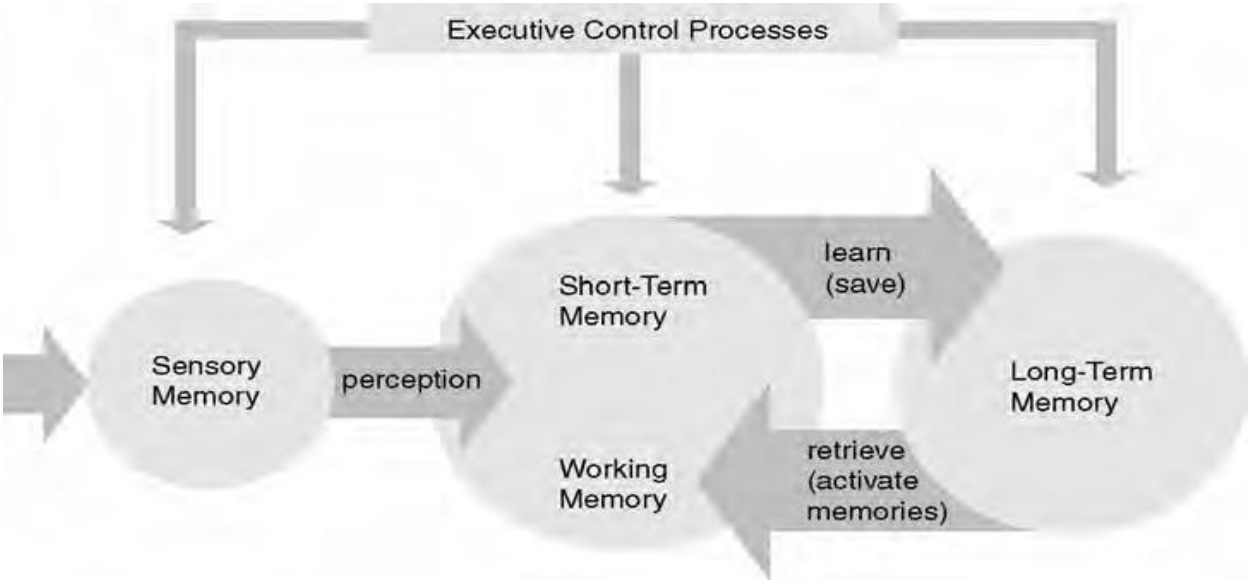

Fig 2.4. Atkinson and Schifrin's Information Processing Model. From *Woolfolk (1998). Published by Allyn & Bacon, Boston, MA. Copyright 1998 by Pearson Education*

Metacognitive reading strategies are important during the reading process for meaningful reading to take place. The focus would now be turned to the importance of metacognitive reading strategies.

2.4.4 The importance of metacognitive reading strategies

Metacognitive reading strategies offer students the ability to be consciously aware of what they have learned and to recognize situations in which it would be useful as well as the processes involved. Carrel *et al.,* (1998, p.4) say that metacognition is knowledge that takes as its object or regulates any aspect of any cognitive behaviour. This has two dimensions to it: knowledge of cognition and regulation of cognition. Knowledge in cognition includes the reader's knowledge about his or her own cognitive resources and the compatibility between the reader and the reading situation. Pammu, Amir and Maasum (2014, p.2) view metacognitive awareness as important in generating more constructive and responsive reading traditions among students. They view metacognition as enhancing students' mental processes and acknowledge that metacognitive reading strategies assist students to gain access into difficult texts.

The metacognitive reading skills are important in:

- clarifying the purposes of reading, that is ,understanding both the explicit and implicit task demands;
- identifying the important aspects of a message;
- focusing attention on the major content rather than the trivial;
- monitoring ongoing activities to determine whether comprehension is occurring and
- engaging in self-questioning to determine whether goals are being achieved, and taking corrective action when failures in comprehension are detected. (Carrel *et al.,* 1998, p.5; van Wyk & Greyling, 2008).

This metacognitive knowledge is based on what Flavell describes in Iwani (2011, p.4). as three dimensional - declarative, procedural and conditional knowledge. Declarative

knowledge is the same as competence, while procedural knowledge is performance. while conditional knowledge is related to knowing why something is taking place. On these grounds, Carrel *et al.,* (1998) maintain that conditional knowledge is important for someone (the reader) who would like to know whether or not a certain strategy is appropriate and whether or not it is working effectively. This is important for reading in science texts because their texts are based on facts and reasons for actions taking place.

Through yet another lens, Sen (2009, p.1) view the metacognitive strategies as important in helping students to focus their attention, activate their background knowledge, which is crucial in their learning. As a result, students are able to set their own objectives to become independent.

Academic literacy is seen as a broad area within the education sector. Various studies have been conducted on academic literacy and academic reading. The discussions below would focus on studies conducted on models of reading which form the conceptual frame of this study.

2.5 MODELS OF READING

According to Alvermann, Unrau and Rudell (2013, p.1), “model help us to visualize and understand research and theories that explain components of the reading process.” A model helps in giving a scenoptic view of the readers’ mind. There are various models applied in reading. The following are the bottom-up and top-down models of reading and their implication on academic reading.

2.5.1 Bottom–up models of reading

Alderson (2000, p.15) defines the bottom-up reading strategies as:

> serial models where the reader begins with the printed word, recognizes graphic stimuli, decodes them to sound, recognizes words and decodes meaning. Each component involves sub processes which take place independently of each other, and build upon prior sub processes.

In line with Alderson (2000), Hasan (2014, p.1) views the bottom-up models as the way a reader constructs texts from the smallest to the largest units. The bottom–up perception of reading is that it is a text-driven process that begins with the perception and recognition of letters, then the phonetic elements, and then words (Ralenala, 2005; Pardede, 2010).The reader makes meaning from the text, depending on his or her knowledge of the textual cues such as sounds, words, and grammatical relationship. In the same light, Alderson and Bachman (2000, p.16) adds that each process involves sub-processes which take place independently of each other but they all build upon prior sub-processes. Even though they may be independent of each other; there is a little rate of dependency on each other for meaning to take place. The bottom-up approach to reading is text based. Hasan (2014, p.1) argues that the bottom-up approach is more on letters and characters, the phonological component, individual words, the lexicon or vocabulary, semantics, syntax or grammar, structure of sentences, paragraphs and the whole text, unlike the top-down approach ,which depends on the activation of the mental structures of the content read.

The bottom–up reading approach is important in students' academic reading because as it is text based, students rely on textual cues to activate their background knowledge about the content. The reader must be familiar with the text structure, for the activation of his or her schema. This will make reading easier for students

2.5.1.1 Limitations of the bottom-up reading strategies

The problem with the bottom up processing model is that it does not recognize the reader's contributions to the reading process (Carrel *et al.,* 1998, p.34). Pardede (2010, p.20) also argues that the bottom-up strategies do not take into consideration the readers' knowledge or experience with the subject matter. Carrel *et al.,* (1988, p.31) on their part also see the bottom-up strategies as not giving any feedback to students. There is no feedback in terms of linkages between the prior sentence and the subsequent one and also the readers' prior knowledge is not considered. The usage of

bottom-up reading strategies does not lead to comprehension of the text (Ajideh, 2003, p.10).

In addition, Ralenala (2005, p.81) points out one of the limitations of the model as not leading to meaningful reading of academic texts. This is a valid point because reading from outside the text as described by Carrel *et al.,* (1988) cannot be considered suitable for science academic reading. Reading of academic texts without considering readers' background knowledge is not in line with Bartlet (1932) 'schema theory. The students' content schemata are very crucial towards the meaningful reading of academic texts. The bottom-up reading model on the other hand, relies on the word and text structure for meaning-making during the reading process. Despite these concerns it can be argued that the bottom–up model is still relevant for science students. Students' knowledge of scientific words and text structure is necessary for their reading of scientific texts although the process should be interactive, as discussed in the forthcoming sections.

2.5.2 Top-down approach

The top-down approach came in as a reaction to the weaknesses of the bottom-up approach. It puts emphasis on meaningful learning, which acknowledges the importance of the context and the readers' background knowledge (Pardede, 2010). He argues that " meaningful learning occurs when new information is presented in a relevant context and is related to what the learner already knows so that it can be easily integrated into ones' existing cognitive structure" (p.3).

The top-down approach occurs as the student makes general predictions based on higher level, general schemata and then searches the input for information to fit into these partially satisfied, higher order schemata (Carrel *et al.,* 1988, p.77; Hedge and Ferris, 2009, p.23). Based on their expectations from the text, readers might approach reading as a guessing game (Hedge and Ferris, 2009, p.23).This guessing game would depend on the schema which they already have about the text. Alderson (2000, p.15) states that the top-down model emphasizes the importance of schema theory in the

interpretation of the text. If the schemata are relevant to the text, then meaningful reading can take place. The top-down approach values what the readers brings to the text unlike the bottom-up approach where the reader relies on information from the text only. In the top-down model, the reader uses his or her prior knowledge to make predictions about the text. In addition to the above, Hedge and Ferris (2009, p.24) argue that "readers will apply their schema in predicting the content and structure of the sampling material, confirming predictions and correcting inappropriate or incomplete predictions." Skudiene (2002, p.1) sees the top down approach as a more relevant one to academic reading as students are required to focus on conceptual content.

Both the top-down and the bottom-up approaches are important in academic reading as a scientific text may require the student to apply his or her background on the content or rely on the textual cues for him or her to be able to decipher meaning from it. In addition to the above, the two approaches augment each other for the construction of meaning to take place although the top-down process is the one most responsible for high order learning at tertiary institutions (Grabe, 2009, p.5).

Both the top-down and the bottom-up approaches to reading use the schema or schemata. In the bottom-up approach, processing is evoked by the incoming data; the features of the data enter the system through the best fitting, bottom-level schemata.

The following diagram illustrates both the bottom-up approach and the top-down approaches to reading.

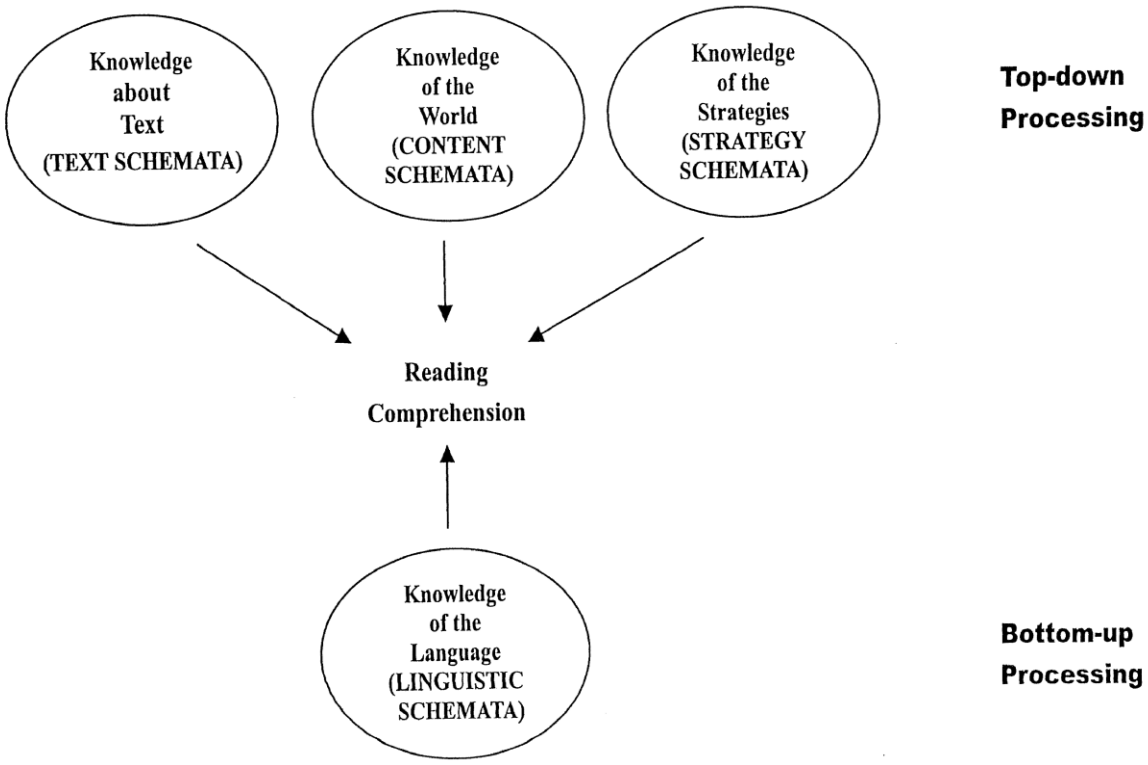

Figure 2.5 Model of Reading Comprehension (Chun, 2000)

The top-down model also has some limitations. Ralenala (2005) points out that the model relies on the usage of the high order skill and neglects other textual cues which may be important in the reading process. The model then becomes more suitable for advanced readers than for beginners. The criticism levelled against the top-down model by Ralenala (2005) means that students should not wholly rely on the top-down approach because it requires them to apply skills which they have not yet acquired. However, students need to be scaffolded into both the bottom-up and top-down approaches, rather than being thrown into the two at tertiary institutions all at once.

Hedge and Ferris (2009, p.24) raise the following as some of the criticisms levelled against the use of guessing in top-down approach, as suggested by Goodman (1968). They argue that good readers do not apply guesses in their reading but base their reading on their interpretative skills.

2.5.3 Reading as an interactive process

The interactive models came about as the results of criticism leveled against the bottom-up and top-down theories. Hasan (2014, p.92) describes the interactive model of reading as involving "both a collection of lower-level comprehension skills and an array of higher level comprehension skills." This is what Carrel *et al.,* (1988, p.57) describe as the combination of textual information with the information the reader brings to a text. Grabe (2009, p.15) sees the interactive process of reading as combining many cognitive processes working together at the same time. There is an interaction between the reader and the writer. The text provides information that the author wants the reader to understand in certain ways. Sengupta (2002, p.2) sees reading as "an interactive process which includes a complex interplay between local level bottom-up strategies and more global levels of top-down, higher order mental process and background knowledge". The reader also brings a wide range of background knowledge to reading and she or he needs to actively construct meaning from the text by comprehending what the writer intends through interpreting it in terms of the background knowledge activated by the reader (Grabe, 2009, p.15). In addition to the interactive process, reading is also seen as a strategic process. Grabe (2009, p.16) forward the following reasons for reading being a strategic process:

- It involves a number of skills and processes used in anticipating text information, select key information, organize and mentally summarise information, monitor comprehension, repair comprehension output to reader goals.
- Reading is a purposeful process. The reader has to know the purpose why she/he is reading and how to go about the process.
- Reading is a comprehending process. This means that all cognitive processes which involve reading are related to the fundamental goal of comprehension.

The table below indicates the theoretical framework of the interactive model of reading as proposed by Stanovich (1980).

Table 2.1.Stanovich Interactive model of reading

STANOVICH MODEL (1980)	• Introduced the interactive-compensatory reading model • Believes that neither Bottom-up nor Top –down address all areas of reading comprehension. But the interactive –compensatory taps into the strengths of both Bottom-up and Top Down. • Says that readers rely on both Bottom-up and Top-Down process simultaneously and alternatively depending on the reading purpose, motivation, schema and knowledge of the subject. • Incorporate the compensatory mode into his model with the interaction between the top-down and bottom-up processing. The compensatory mode enables the reader to, at any level compensate for his or her deficiencies at any other level.

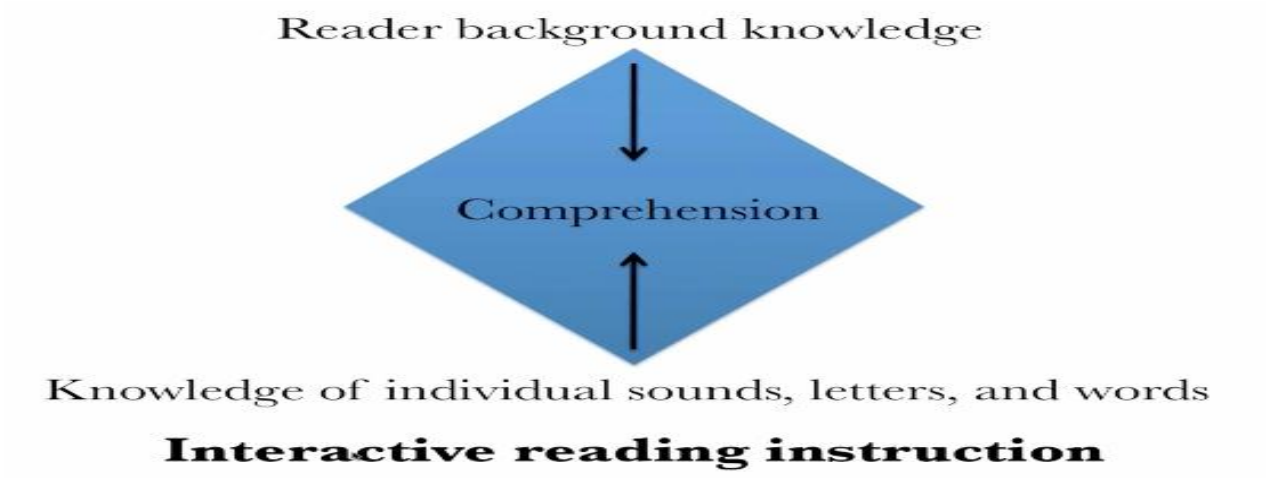

Figure 2.6. Courtesy of Dr Neil Anderson, Brigham Young University

2.5.4 The text model of reading

Grabe (2009, p.40) states that for comprehension to take place, the reader must be conversant with the text structure and the situation of the text. This is in view that reading is discipline-specific where the text of a specific discipline differs from that of other disciplines. The above statement means that students should be conversant with text structures of their different modules for them to be able to comprehend various texts in their different disciplines. The focus below is on what a text is and how important it is towards academic reading.

2.5.4.1 A text

A text is defined by Halliday and Hasan (1989, p.10) as:

> A spoken or written language that expresses meaning. It must be something which is a semantic unit. A text should also be seen as a product and a process. It is a product in the sense that it is an output, something that can be recorded and studied, having a process that can be recorded in systematic terms.

A text is also described as a process. It is a process in the sense that:

> it is a continuous process of semantic choice, a movement through the networks of meaning potential, with each set of choices constituting the environment for a further set (Halliday & Hasan, 1989).

The above quotation means that students should be able to express their thinking through writing systematic, meaningful sentences or paragraphs. This is based on the nature of the relationship between reading and writing. If a text is defined as a product and a process, then students should have skills or strategies to comprehend various texts especially in their field which is in this case is science reading.

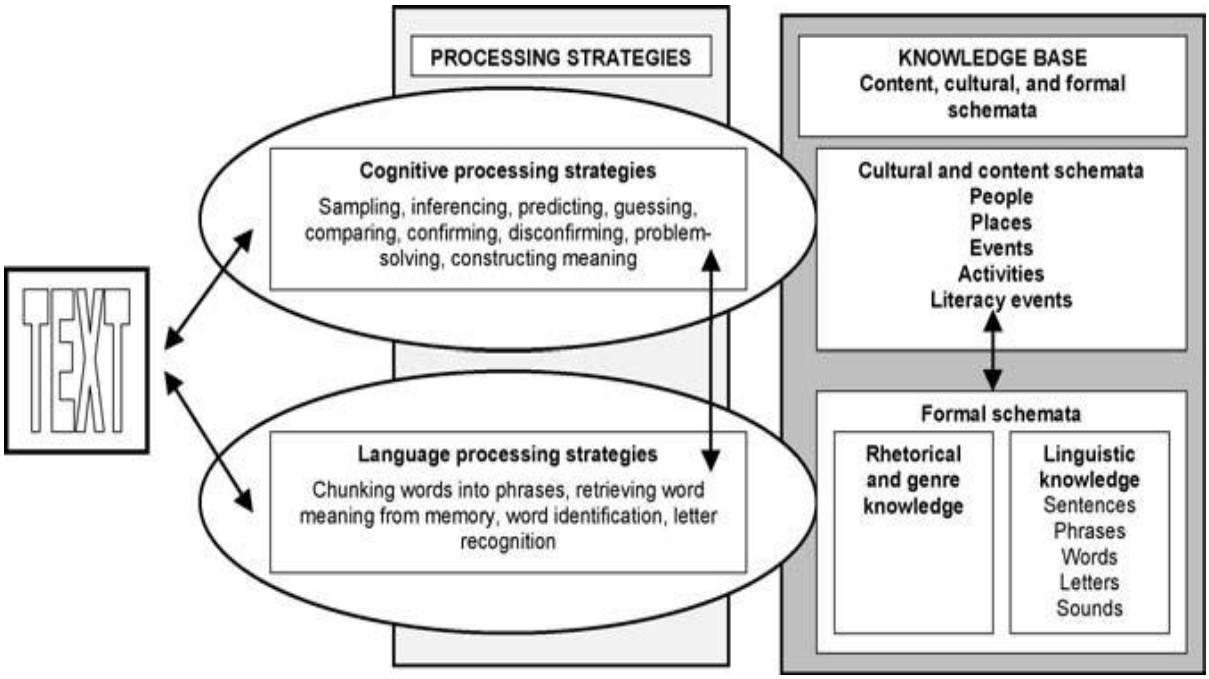

FIGURE 2.7 Schematic View of Reading Processes. Adapted from Birch (2007, p. 3, Figure 1.1) and Carrel *et al*. (1990, p. 8).

The following discussion is focused on what academic texts are and how crucial they are towards academic reading.

2.5.4.2 Academic texts

Academic texts are generally known to be more complex than general text in high schools and unfamiliarity with academic texts may create some challenges to students. Pretorius (2006, p.433) explains the nature of academic texts as conceptually dense and often present conflicting viewpoints. Rose *et al.,* (2003) comment on the complexity of the academic texts by stating that “language patterns are specialized and involve abstract concepts and discipline-specific technical terms”.

Text comprehension involves the combination of information from the currently formed proposition with the active meaning elements that have been integrated into a network of ideas already activated from textual input (Grabe, 2009, p.40). In addition to the view

above, Ozuru, Dempsey and McNamara (2008, p.1) relate academic text to topic relevant to student's prior knowledge. They argue that topic-prior knowledge refers to "the readers' pre-existing knowledge related to the text content". This statement reaffirms the importance of the knowledge of the structure of the text in science. Students need to be familiar with the structure of these texts for them to meaningfully read through them. They therefore need some inferencing skills to do so. A text model of reading comprehension also requires the use of "bridging" inferences to connect new propositions to the network of already active propositional ideas and relationships (Grabe, 2009, p.40).The newly-formed textual propositions are maintained by existing reference to some element or idea in the existing network. It overlaps with already active information providing a direct connection into the network and strengthening the activity of that specific element in the network. The new element may represent extensions of existing information to become linked as part of a supporting network (Grabe, 2009, p.40).

The application of the above views on text implies that a scientific text has its own language different from an ordinary text in English. Hutchinson and Waters, in Parkinson (2000, p.369) view the scientific language as being different from ordinary everyday language in terms of:

- Vocabulary,
- The higher frequency of some grammatical forms and
- Topics

The scientific discourse is therefore a unique text. For a text to be classified as scientific, it should have a cluster of features throughout the text.

Hart (2014, p. 91) designed a reading model trying to address the issue of the knowledge of the text. In his design, he stated that reading and writing are hugely complex task that involve recognizing and using patterns of language at three levels, which are:

- At the level of text, readers must recognize what a text is about and how it is organized as sequence of events in stories, or as chunks of information in factual texts.
- At the level of the sentence, readers must recognise how words are arranged in phrases, and what phrases means, such as who or what the sentence is about, what they are doing, where, when, why and how.
- At the level of the word, readers must recognize what each word means, and how letters are arranged into patterns that spell the word.

2.5.4.3 The textual comprehension

Grabe (2009, p.40) states that for comprehension to take place, the reader must be conversant with the text structure and the situation of the text. The above means that students should be conversant with text structures of their different modules for them to be able to comprehend various texts. As it is said that reading is discipline specific, texts from different disciplines differ. Halliday and Hasan (1976) refer to a texts as:

> having texture, and this is what distinguishes it from something that is not text…If a passage of English containing more than one sentence is perceived as a text, there will be certain linguistic features present in that passage which can be identified as contributing to its total unity and giving it texture.

The gist of what Halliday and Hassan are saying is that a text has its own features which separates it from other types of texts. Therefore, if students are conversant with the genre of science texts, it makes it easier for them to comprehend these texts. Grabe (2009, p.40) adds to the information of text comprehension by stating that "comprehension requires the use of "bridging" inferences to connect new propositions to the network of already active propositional ideas and relationships." These inferences are based on students' background knowledge on the content in texts. This fact makes the textual model of reading linked to the schema theory (Carrel *et al.,* 1988) or the activation of the background knowledge in reading. The combination of the new information with the information which already exists is an aspect of the schema theory. Grabe (2009) asserts that students 'prior knowledge is a valuable source for their

reading. This aspect is also linked to reading as an interactive process. There is an interaction between the new information “meaning elements” in the comprehension of texts. The above supposition reiterates the fact that students need to be conversant with the text structure to activate their schema relating to the content of the text for them to be able to construct meaning.

The model relies on the usage of the high order skill and downplay other textual cues which may be important in the reading process. The model then becomes more suitable for advanced readers than for beginners.The construction of meaning also depends on the situation of their reading. The following section will focus on the situational model of reading.

2.5.5 Situational model of reading

Grabe (2009, p.43) states that “when we read a text, we normally bring our own information in the processing of a text. This information includes our understanding of the ways in which discourse is structured, past instances of reading similar types of texts, the specific knowledge we have from these past reading experiences, and our attitudes towards the text, the author, the emerging situation and the genre”. Graesser *et al.,* (2011, p.11) view situational model as being related to the text content. This text content’s relation to situational model of reading is particularly visible in scientific texts. These scientific texts have the following features which students must be conversant with. These include: causation, properties of components, time, space, protagonists. Situational model of reading also takes into consideration factors that reflect the context, the attitudes of the readers, their prior knowledge and others. It is important that students’ background knowledge related to the texts be activated during the process of reading.

2.6. TYPES OF READING

There are various forms or types of reading that students could be engaged in order to acquire academic reading skills. The following focuses on the types of reading and suggested ways through which students' academic reading skills can be enhanced.

2.6.1 Extensive reading

Day and Bamford (1998, p.5) explain extensive reading as focusing on the rapid reading of books with attention on meaning of texts. This means that students should be exposed to a lot of academic books. Extensive reading have benefits for students in academic contexts. Day and Bamford (1998, p.6) state that it helps students in their development of automaticity, enhances their background knowledge and improves comprehension skills which promote confidence and motivation. Because of its nature of reading for pleasure, hence may not lead students towards the meaningful acquisition of the academic reading skills needed for them to succeed at tertiary institutions. It does not expose students to text genres, which are important for successful academic reading.

The above settings of extensive reading mean that teachers should create situations conducive for students to be involved in reading. Extensive reading should facilitate the development of students' reading fluency, which is one requirement for being academically ready (Stoller, 2015, p.156).

Contrary to extensive reading, intensive reading is suggested as a better approach towards enhancing students' academic skills. The following deliberations are on what intensive reading is and how it aids in the development of the academic reading skills.

2.6.2 Intensive reading

Intensive reading is described as " taking a text and studying it line by line, referring at every moment to our dictionary and our grammar, comparing, analyzing, translating, and retaining every expression that it contains" (Day & Bamford, 1988, p.5). Students are encouraged to read each text carefully and thoroughly for them to make meaning

out of it. Intensive reading is more related to academic reading because it uses the same conventions which include reading a text and looking for a deeper meaning and where students are required to analyze what they read. The basic differences between intensive reading and extensive reading may be illustrated in the following table:

Table 2.2 Intensive and Extensive reading

Intensive Reading		**Extensive Reading**
Analysis of the language	LINGUSITIC FOCUS	Fluency, skill forming
Usually difficult	DIFFICULTY	Very easy
Little	AMOUNT	A book a week
Teacher selects	SELECTION	Learner selects
All learners study the same material	WHAT MATERIAL	All learners read different things(something interesting to them)
In class	WHERE	Mostly at home
Checked by specific questions	COMPREHENSION	Checked by reports/summaries

Table 3. (Adapted from Kreda'tusoval 2000)

Recent studies on extensive reading have shown positive effects of extensive reading on academic reading. In this regard, Erfanpour (2013, p.2) states that there is enough evidence to suggest that extensive reading has an effect on existing approaches. This means that students who use extensive reading have more positive attitudes towards academic reading. However, intensive reading still supersedes extensive reading. In light of this, Waring, in Erfanpour (2013, p 4) argues that intensive reading is very useful for vocabulary learning and understanding how a text is organized leads to an improved understanding of texts.

From the discussion on the extensive and intensive reading above, the researcher acknowledges that both processes of reading are discipline specific. The application of

the above would therefore require a careful synthesizes of materials from a number of sources (Sengupta, 2002, p.2).

2.7 READING STRATEGIES

Pearson and Fielding, in Henia (2003), describe strategies as conscious and flexible plans that readers apply to particular texts and tasks**.** McNamara (2007, p.6) define reading comprehension strategies as "a cognitive or behavioural action that is enacted under particular contextual conditions, with the goal of improving some aspect of comprehension.**"** Cekiso and Madikiza (2014, p.1) view reading strategies as "specific actions, behaviours, steps or techniques that learners use to improve their progress in comprehending, internalizing and using a second language." These strategies are what Li and Munby (1996) refer to as important for the development of metacognitive reading. McNamara (2007, p.4) supports Li and Munby' (1996) when he states that they help readers in deepening their understanding of the content being read. For readers to develop deep comprehension strategies, they require inferencing skills (the ability to link ideas coherently, and the ability to scrutinize motives behind authors' writings). Cekiso and Madikiza (2014, p.2) agree with McNamara (2007) that strategic awareness and monitoring of comprehension process are critical aspects of skilled reading.

For the purpose of this study, the researcher aims at developing the academic reading strategies among students which they can apply at universities. These academic reading skills are important when students go up the education ladder (Cekiso & Madikiza, 2014, p.2).The fact remains that students need to be aware of these strategies and how to use these strategies in different academic reading situations. The following are the reading strategies classified into three types:

2.7.1 Pre-reading strategies

Pre-reading strategies are described as helping students in identifying their reading demands, activating what they already know about the topic and anticipating what will be read (Cekiso & Madikiza, 2014, p.2; Ajideh, 2003, p.6). It is during the pre-reading stage that students activate their background knowledge relating to their science

content. Students get motivated and can predict what to expect in their reading based on background knowledge. Pardede (2010, p.4) clarifies more on the pre-reading strategies by stating that students should "employ techniques such as prediction, semantic mapping, and reconciled reading." Again, he argues that pre-reading activities are important in academic reading since they are:

> devices for bridging the gap between the text's content and the reader's schemata." Pre –reading activities actively involve students in the themes, concepts, and vocabulary of the text before they even pick up the article, textbook passage, or piece of literature.

Pre-reading strategies are aimed at activating students' background knowledge. In applying prediction, the student should be questioning his or her schemata and eliminating the ones not relevant to his or her reading. This is what Smith, in Pardede (2010, p.5) view as the elimination of unlikely alternatives. This means that the reader would be engaged in a selective process of aligning his or her schemata with the content for meaning-making to take place. The researcher agrees with Smith, in Pardede (2010, p.5), who states the importance of prediction in pre-reading stage as:

> bringing potential meaning to texts, reducing ambiguity and eliminating in advance irrelevant alternatives. Thus, we are able to generate comprehensible experience from inert pages of print.

It is on the basis of the argument presented above that it is important to develop or activate students' pre reading strategies, since these strategies help in developing their schema on the content taught in science. It is important to activate student's background knowledge, and to check the relationship between this knowledge and text content. The development of strategies during the pre-reading stage help to prepare students for the during–reading stage.

2.7.2 During-reading strategies

During-reading strategies are described as the ones which deal with the main reading of the text. At this stage, the students should be able to identify the main ideas of the

texts. In sciences, this refers to the application of the inferencing skills in deciphering meaning from the text. Students' knowledge of scientific words (vocabulary development) is very much relevant during the application of these strategies and developing note-taking strategies which can help them in making meaning from the texts (Pardede, 2010, p.5).

2.7.3 Post-reading strategies

These are the reading strategies which help students to deepen their understanding of texts (Cekiso & Madikiza, 2014, p.2; McNamara, 2007, p.34). Students build further connections and expand their prior knowledge of the subject matter. The critical is that students are given opportunities to draw conclusions, make judgements on the issues read, and to apply their generalization to current issues or problems.

In addition to inferencing skills, students require the following strategies to successfully navigate through academic texts:

2.7.4 Use of background knowledge

This refers to the utilization of background knowledge in both L1 and L2 reading. The discussion on the use of background knowledge is more related to the debate on the schema theory. Henia (2003, p.205) argues that background knowledge of the content material is a necessary component of academic competence. Krashen (2007, p.2) also views the use of the background knowledge as being necessary for academic reading. Van Wyk and Greyling (2008, p.4) add to the above importance of background knowledge by arguing that the background knowledge helps to scaffold new textual encounters which help to enhance understanding that then become reinforced to form part of knowledge. Ozuru, Dempsey and McNamara (2008, p.1) relate the background knowledge with a topic relevant to prior knowledge. They describe the topi- relevant-prior knowledge as the pre-existing knowledge related to the text content that is often measured with open-ended and /multiple choice questions on vocabulary and factual information. This means that students should have knowledge about the content they

are reading for them to understand the text. The prior knowledge of the text facilitates and enhances text comprehension.

2.7.5 Self-questioning

Self-questioning is a strategy that involves readers asking questions about their own reading to find out whether they understand or not. It involves metacognition as the questioning part normally engages the mind. Based on the above, Henia (2003) indicates the relevance of self-questioning as an academic reading strategy. Self-questioning therefore involves the interrogation of the text as one reads through. Tracey and Morrow (2006, p.79) view self-questioning as a strategy applied mostly in critical reading which applies to academic reading; this means that students must have this skill in order to evaluate academic texts critically whenever they come across them.

2.7.6 The use of prediction and contextual cues

Pardede (2010, p.6) views prediction as a good strategy in the pre-reading activities because “the brain is always anticipating and predicting as it seeks order and significance in sensory inputs’.

Reading has to be accessible in content and appropriate genre (Parkinson *et al.,* 2008, p.15).The ability to read depends on whether the reader is conversant with the content and the genre of his reading. The discussion that follows focuses on the different theories of reading in academic reading.

2.8 ACADEMIC READING

Academic reading is according to Sengupta (2002, p.2), a complex, multi-level and different kind of reading from other kinds of reading. It is “reading for in-depth comprehension which requires a special kind of reading strategy, demanding a different type of processing in terms of attention, information encoding and retrieval” (Nel & Nel, 2014, p.2). It is a purposeful and critical reading of a range of lengthy academic texts varying in length. This form of reading is complex for students as it requires certain skills which are not the same as in other ordinary reading settings. The process of academic

reading serves as the basis for whatever learning is taking place at universities (Nel & Nel, 2014, p.2). Academic reading is, according to Sengupta (2002, p.2), a purposeful and critical reading of a range of lengthy academic texts for completing the study of specific major subject areas. This is what Grabe (2009, p.24) refers to as purposeful reading.

The following skills are considered as important in academic reading by Munby, in Alderson (2000, p.10), who also referred to them as reading 'micro skills':

- recognizing the script of a language.
- deducing the meaning and use of unfamiliar lexical items.
- understanding explicitly stated information.
- understanding information when not explicitly stated.
- understanding the conceptual meaning.
- understanding the communicative value of sentences.
- understanding relations within the sentence.
- understanding relations between parts of text through lexical cohesion devices.
- understanding cohesion between parts of a text through grammatical cohesion devices.
- interpreting text by going outside it.
- recognizing indicators in discourse.
- identifying the main point or important information in discourse.
- distinguishing the main idea from supporting details.
- extracting salient details to summarise.
- extracting relevant points from a text selectively.
- using basic referencing skills.
- skimming
- scanning to locate specifically required information.
- transcoding information to diagrammatic display.

The above micro skills are also related to reading competencies as outlined by Weideman (2003); Ratange (2009); and Cliff and Hanslo (2003).The acquisition of the above skills mean that one has ability for academic reading (Sengupta, 2002). The teaching of the above skills, to the science foundation students, therefore can enhance their chances of succeeding in their academic pursuits.

Academic reading is a complex process which is aligned to specific skills in specific fields. It requires an understanding of the nature of knowledge in the specific discipline (Nel & Nel, 2014, p.3).This means that students need the skills to strategically read complex academic texts with a high level of understanding, in this case science texts (Nel & Nel, 2014, p.3). The knowledge of the text structure of different scientific texts in specific disciplines can lead to students' success in their studies. Nel and Nel (2014, p.3) describe effective academic reading as involving several kinds of metacognitive knowledge. This includes knowledge of the criterion task and what needs to be studied and knowledge of how best to process the text for learning. Some of the skills students require in scientific academic reading as noted by Nel and Nel (2014, p.3) are:

- ability to comprehend texts by actively constructing meaning.
- integrating information from the text with information from their background knowledge.
- ability to discern important information from the unimportant ones.
- selecting, organizing and interpreting information across disciplines.
- ability to synthesize and integrate information from multiple sources with different text types.

In addition to the above skills, Zulu (2005, p.112) describes the requirements for advanced plus-level readers as:

- The ability to follow essential points of written discourse at a superior level in areas of special interest or knowledge.
- The ability to understand parts of texts which are conceptually abstract and linguistically complex, and /or texts which treat unfamiliar topics and situations, as well as some texts which involve aspects of target- language culture.
- The ability to comprehend the facts to make appropriate inferences.
- The ability to exhibit an emerging awareness of the aesthetic properties of language and its literary styles."

The above skills demand that students should be strategic when engaging in academic reading activities for meaning-making to take place.

Carrel *et al.,* (1988, P.1) outline the relationship between reading and thought by stating that:

> In second language teaching or learning situations for academic purposes, especially in higher education in English medium universities or other programs that make extensive use of academic materials written in English, reading is paramount.

This means that without the reading competencies as outlined, students may find it difficult to achieve and access materials. Bharuthram (2012, p.2) says that academic reading is one of the most important academic tasks encountered by students. This is because reading is viewed as "the essence of all formal education" and also as "literacy in academic settings exists within the context of a massive amount of print information" (Bharuthram, 2012, p.2). It is only through reading that students can access this massive information. The acquisition and possession of the reading competencies is thus important to these students, hence the rationale for this study.

In addition, Tabatabaei and Assari (2011, p.206) view academic reading as a combination of both the L2 proficiency and the reading ability. It therefore implies that the second language reader has to be strategic, possessing both the procedural and declarative knowledge of reading strategies for meaningful comprehension to take place. Some of these strategies are transferred from the reader's L1 to the L2 or to the different academic fields of study. The reading strategies may be defined as consciously chosen actions in relation to levels of reading processes that facilitate effective processing. If students' academic reading skills are not developed, these students may experience difficulties in reading academic texts. Some of the reasons for these difficulties are:

- A poor ability to read and digest course material impacts negatively on students' performance and on their self-esteem.

- An inability to read affects students' ability to follow written instructions, be these in the form of essay questions or examinations.
- An inability to read texts impacts negatively on the students' ability to model their own writing on them, conceptually, linguistically and structurally (Bharuthman, 2012, p.4).

To this end, Grabe and Stoller (2001) add to the notion of what academic reading entails. They view academic reading as:

2.8.1 Careful reading of texts

This entails that students have to demonstrate a good understanding of details in the text, to learn from them and to use the information for other tasks (Grabe & Stoller, 2001, p.7). In this sense, students therefore need to have skills such as the ability to recognize main ideas and analyze supporting information, arguments or details that explain the main ideas. Weir *et al.,* (2005, p.101) hold that students should be able to make propositional inferences, establish how ideas and details relate to each other and the whole text as well as show how ideas and details relate to each other across texts.

2.8.2 Awareness of text structure and discourse organization

Grabe and Stoller (2001, p.8) note the awareness of the text structure as being very critical in academic reading. Similarly, Hogan *et al.,* (2011, p.9) view knowledge of text structure as knowledge of how a written text is organized to guide comprehension. This means that students have to recognize relationships across both sentences and large units of text and this knowledge of text structure should facilitate their ability to attend to text details and then enhance comprehension. In this light, Elosua, Garcia-Madruga, Vila, and Gomez-Velga (2013, p.3) argue that reading comprehension requires the knowledge of text structures. Students should be aware of texts skills, which are problem-solving, comparing and contrasting, narrating, sequencing or classification. This can also be related to the knowledge of genre. The above view is shared by Carrel *et al.,* (1998, p .98) when they show the impact of the knowledge of text structure in academic reading. Schoenbach (1999, p.1) also add to the importance of students'

awareness of text structure by stressing that it either enhances comprehension or if not properly used, it may confuse the students' reading process.

Texts in science reading are often expository and require students to have the ability to compare and contrast, to determine the cause and effect, and for problem-solving (Elosua *et al.,* 2013, p.4). Knowledge of text structure is said to be important in the acquisition of summary skills. These writing skills are described as the ability to construct a concise account of the main ideas. Children are taught summary skills to make them aware of the highest level of information or main ideas in a text as well as details that support the main idea (Elosua *et al.,* 2013, p.4).

(a) Use of graphic organizers to support comprehension and discourse organization awareness

Grabe and Stoller (2001, p.8) argue that it is crucial for students to be aware of how graphic organizers are used in texts as they help students in identifying the key information from a text. Thus, identifying the organization of text information, the ways that information is structured and relationships among ideas presented in a text or a portion of a text assist with academic reading.

These textual dimensions may be classified in terms of low-quality base and the high-quality base of the text. This may be represented in the following figure:

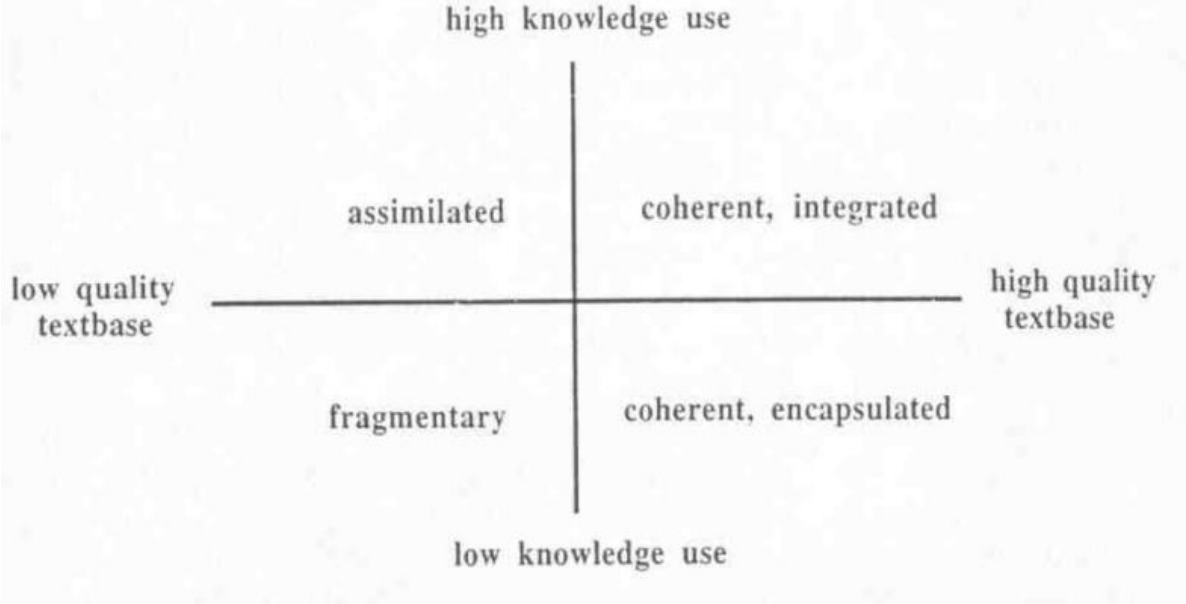

Fig2.8 Multidimensional space formed by considering knowledge used and quality of the text base in classifying mental representations of text.

(b) Strategic reading

The argument put forth for strategic reading by Grabe and Stoller (2001, p.9) is that it aims at equipping students with skills where they should be able to:

- Understand the goals of a reading activity.
- Have a range of well-practiced reading strategies at their disposal.
- Apply these strategies in efficient combinations, monitor comprehension appropriately and repair comprehension problems, effectively.

The above strategies can be seen as the corner stone of academic reading (Grabe & Stoller, 2001). Touma (2012, p.82) acknowledges the importance of strategic reading as crucial to academic contexts as skill usually inseparable from the act of comprehending and learning difficult and unfamiliar concepts. Some of the reading strategies relevant to academic reading, according to Touma (2012) are: supervising, supporting, paraphrasing, establishing text coherence and test taking.

Handy and Stein (2010, p.19) state that “students who use reading strategies are able to synthesize prior knowledge and information from academic texts to create new knowledge”. The teaching of reading strategies is therefore important for students’ engagement in academic reading. Based on the above, academic reading is the centre of each and every academic course at tertiary institutions. Some of the greatest challenges facing students at tertiary institutions are related to academic reading and writing.

For students to successfully go through their studies, they should have acquired academic reading skills (Alderson, 2000, p.23). Students need academic reading skills to be able to interact with materials which may be challenging to them. This means that students should have what is called Cognitive Academic Language Proficiency (CALP) Cummins, in Spurlin (1995). CALP is described as context-reduced, cognitively demanding found in written texts in content areas such as Mathematics, Physical Science and Social Sciences. CALP is socially grounded, and it could only develop within a matrix of human interaction (Ralenala, 2003, p.109). CALP is important for science students because they engage with texts which are more demanding and if they have not developed the strategies and the vocabulary needed for reading science texts they would have difficulties in reading those texts. This demands that students should have academic reading abilities, for them to be successful in accessing the knowledge in textbooks.

The figure below helps to illustrate the factors which influence the reading of academic texts. The development of these factors is known to enhance students’ chances of succeeding in reading science texts.

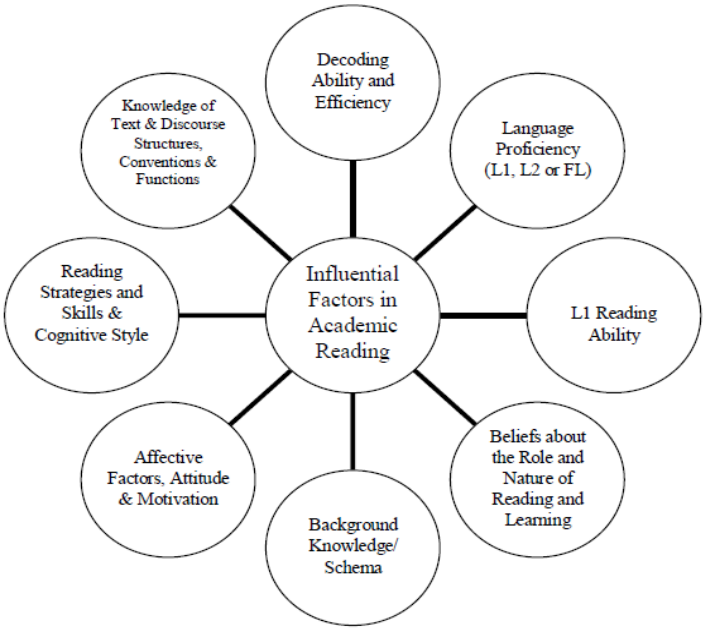

Fig 2.9. Influential factors in academic reading

The academic demands as outlined above also relates to Vygotsky (1978)'s theory of language development. The Vygotsky theory of language development and how it relates to academic reading would be looked at in the section that follows.

2.8.3 Vygotsky's theory of Language Development

Vygotsky (1978) developed a theory which relates to the way students learn a language for different purposes. He states that children learn language first to meet their social needs, but when they have internalized it, this leads to the development of higher-order thinking and cognitive skills referred to as the Zone of Proximal Development (ZDP) (Savas, 2009, p.397). The Zone of Proximal Development is described as "the distance between the actual development level as determined by independent problem-solving, and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers" (Savas, 2009, p. 397). The cognitive development of students is related to their performance at the university and

this is also related to their achievement of CALP skills. Vygotsky's theory of the Zone of Proximal Development is related to the metacognition theories of language learning and teaching. A student who has reached the Zone of Proximal Development is ready to advance to a stage where he/she can venture into abstract thinking and engage in activities with the help of someone who is an expert. This is what Rose *et al.,* (2003) and Parkinson *et al*., (2007) describe as scaffolding. Rose *et al.,* (2003, p.42) describe scaffolding as "the support that a teacher can give learners so that they can work at a much higher level than is possible on their own." The point of this theory is that students can achieve reading competencies, if they are given the necessary support .The environment for their studies together with the texts should be conducive for learning. Students should be introduced into what academic reading entails. This is related to Krashen's theory of Input Hypothesis (2007).

2.8.4 Krashen Input Hypothesis

According to Krashen and Brown (2007, p.2), reading is a powerful form of comprehensible input for the development of academic language, whether 'heavy" or "light" reading. Krashen says that for language learning to take place, there must be a comprehensible input from the environment or the educator. This input should be higher than what the student already knows. The content presented to students should be exposed to them through various types of texts. This relates well with CALP because the knowledge of the academic content in the specific field (science) enhances the academic reading of students. Krashen (2004, p.12) sees reading as a comprehensible input which contributes towards the content and context of academic reading.

Krashen's Input Hypothesis was criticized for the part the student plays. Savas (2009, p. 397) states that "learners need to be active participants when receiving language inputs. Only listening to new language structures cannot lead to successful language learning. Long's (1983)'s version of Input Hypothesis means that students should be actively involved in intensive and interactive reading (Eskey, Devine & Carrel, 1988).

Since reading is a branch of academic literacy, it is deemed fit to outline what academic literacy and academic reading are and should outline the skills needed for students to succeed at tertiary level.

2.9. READING AND ACADEMIC LITERACY

Academic reading is imbedded within the context of academic literacy, it is therefore important to reflect on what academic literacy is as well as to describe its relationship to the development of academic reading strategies.

2.9.1 Definition of Academic Literacy

Academic Literacy is defined as "the ability to read and write various texts assigned in the university" (Braine, 2002, p.4). Parkinson (2000, p.371), argues that it is communicative practices associated with particular uses of both written and spoken forms which extend the definition to speaking as well as reading and writing. Braine's definition (2004, p.4) is in line with Leibowitz's (2007, p.4) since both authors acknowledge it takes place at tertiary institutions which means that students should have the expected competencies for them to be able to move from one level to another within an institution (Thaiss, & Zawacki, 2006, p.4).

In addition to the above views of what academic literacy are, Ratange (2007, p.22) views academic literacy as a complex linguistic, conceptual and skills resources for analyzing, constructing and communicating knowledge of the subject matter. The recent debate on academic literacy is influenced by views from the emergent new literacies theories.

2.9.2 New Literacies

According to Parkinson (2000, p.260), literacy is "a multiplicity of practices that are embedded in particular social circumstances and whose acquisition takes place in and is specific to particular cultural contexts" hence, literacy is contextual and depends on the specific discipline or a discourse community. Science students must therefore, be able to read and write laboratory reports for them to be included in the discourse

community of scientists. In other words, for one to be accepted as a member of a discourse community, one should be conversant with the cultural norms and contexts of that community. This is suggestive of the fact that students should be familiar with the science culture and the values associated with the discourse community of science, for them to be accepted in science. Parkinson *et al.,* (2008, p.12) bring in the multiplicity of skills involved in academic literacy by stating that academic literacy branches like reading and writing are used for a wide range of different purposes. These different purposes have a wide range of different behaviours, different literacy events and different value systems associated with them.

The multiplicity of practices refers to the point that academic literacy is comprising of a variety of discourses with their own conventions and methods of inquiry. These conventions are discipline and context-specific (Parkinson *et al.,* 2007). Street (2003) argues that "literacy varies from one content to another and from one culture to another."

Students need to show that they belong to a shared academic culture by producing work that shows clear argument, analytical reasoning, critique and relevance (van Schalkwyk 2008, p.23). Van Schalkwyk (2008, p.24) also maintains that academic literacy involves knowing how to speak and act in an academic discourse and they need to be given a chance to participate with others to develop the necessary competencies. This chance, referred to as 'scaffolding' by Rose *et al.,* (2003) needs to be given in a supportive way by the lecturer.

The researcher's approach towards academic literacy is based on the ideological literacy proposed by Street (2003). Street (2003, p.77) states that "literacy is about knowledge and the ways in which people address reading and writing, and are themselves rooted in conceptions of knowledge, identity, and being". It is this conception of knowledge and identity in science which led the researcher to have passion about developing academic reading skills in students, and making them to identify with the science discourse community in accordance with Street's notion.

> Academic Literacy is acquired over an extended period of time in a complex, dynamic, manner, and it can be acquired from data from multiple sources- like graduate teachers, advisors, peers journal entries, prescribed and preference tests as well as written assignments (Street, 2003, p.9).

Parkinson *et al.,* (2008, p.13) argue that academic literacy in science involves "learning of the language of science and acting as a member of the community of people who do so." This means that students should be familiarized with the scientific texts and be able to produce new texts. They maintain that academic literacy in science involves "learning to communicate in the language of science and act as a member of the community of people who do so." Students should be used to the scientific environment, engage in scientific texts to produce new texts, collect, analyze and write on real data.

Academic literacy is also viewed as having language patterns which are specialized and involve abstract concepts and discipline-specific technical terms (Parkinson *et al.,* 2008, p.14 and Rose *et al.,* (2003). Thus, for students to be able to perform the above, they must be conversant with the academic literacy (AL) competencies. The following section focuses on these competencies.

2.9.3 Academic Literacy competencies

Weideman (2003) and Foxcroft (2004) describe the following as the competencies which must be met for an academically literate students. Students should be able to:

- understand a range of academic vocabulary in science context
- interpret and use metaphor and idiom, and perceive connotation, word play and ambiguity;
- understand relations between different parts of a text, be aware of the logical development of (an academic) text, via introductions to conclusions, and know how to use language that serves to make the different parts of a text hang together:
- interpret different kinds of text type (genre),and show sensitivity for the meaning that they convey, and the audience that they are aimed at:
- interpret, use and produce information presented in graphic or visual format;

- make distinctions between essential and non-essential information, fact and opinion, propositions and arguments; distinguish between cause and effect, classify, categorize and handle data that make comparisons;
- see sequence and order, do simple numerical estimates and computations that are relevant to academic information, that allow comparisons to be made, and can be applied for the purposes of an argument;
- know what counts as evidence for an argument, extrapolate from information by making inferences, and apply the information or its implications to other cases than the one at hand;
- understand the communicative function of various ways of expression in academic language(such as defining, providing examples, arguing):and
- Make meaning (e.g. of an academic text) beyond the level of the sentence.
- The above competencies are seen as relevant to the study because students are expected to possess them for success with their tertiary reading studies.

In addition, NBT commissioned by the Higher Education South Africa (2006), in its tests on AL focus on the reading competencies as some of the criteria for the assessment. The NBT competencies are first presented in the table 3 and then discussed thereafter.

2.9.3.1 Table 3. Performance levels of the NBT

64% -100% Proficient	Performance in domain areas suggests that academic performance will not be adversely affected. If admitted, students should be placed in regular programmes of study. AL (65%), QL (66%) and Maths (62%)
Intermediate 41%-64%	Challenges in domain areas identified such that it is predicted that academic progress will be affected. If admitted, students' educational needs should be met in a way deemed appropriate by the institution (e.g. extended or augmented programmes, (special skills provision). AL (42%), QL (38%) and Maths (34%)

Basic 0%-40%	Serious learning challenges identified: it is predicted that students will not cope with degree-level study without extensive and long-term support, perhaps best provided through bridging programmes or FET Colleges. Institutions that register students performing at this level would need to provide such support.

Adapted from Du Plessis L. and Gerber D 2012

The following discussion will focus on the description of AL skills assessed in the NBT.

Table 4.Skills assessed in the NBT Academic Literacy section

Skill assessed	**Explanation of Skill**
Cohesion	Readers' abilities to "see" how parts of sentences/discourse define other parts; or are example of ideas; or are supports for arguments; or attempts to persuade.
Understanding discourse relations	Readers ' capacities to 'see' the structure and organization of discourse and argument, by paying attention-within and between paragraphs in text-to transitions in argument; superordinate and subordinate ideas; introductions and conclusions; logical development.
Separating the essential from the non-essential	Readers' capacities to 'see' main ideas and supporting detail; statements and examples; facts and opinions; propositions and their arguments; being able to classify, categorise and 'label'
Grammar/syntax as these affect academic meaning and interpretation	Readers' capacities to understand and analyse the extent to which grammatical and sentence structures are organized in academic language, and the extent to which these structures affect and can change meaning.
Inferencing	Readers' capacities to draw conclusions and apply insights, either on the basis of what is stated in texts or is implied by these texts.
Metaphorical expression	Readers 'abilities to understand and work with metaphor in language. This includes

	their capacity to perceive language connotation, word, play, ambiguity, idiomatic expressions, and so on.
Genre	Readers' abilities to perceive 'audience' in text and purpose in writing, including an ability to understand text register (formality/informality) and tone (didactic/informative/persuasive/etc.)
Vocabulary	Readers' ability to derive/work out word meanings from their context.

Adapted from Cliff and Hanslo (2009)

These academic reading competencies in the table are discussed fully in the subsequent sections.

2.9.3.1 Cohesion

Grabe (2009, p.255) describes cohesion as "the surface level signals that effect the discourse organization of a text, and the intended purposes of the writer." Cohesion is the use of language connectors as a "cuing system" to refer the reader back and forward across sentences (i.e. inter-sentential) to elements occurring in the text. As such, the internal relatedness of a text (cohesion) assists the reader to process and create a coherent understanding of the writer's main propositions. Berzilanovich (2008, p.2) describes cohesion as "one of the text properties that contributes to the organisation of discourse". It deals with bringing about the connectedness of a text or unity in the text. The emphasis is on the connectedness of the text which is brought about by cohesive signals such as markers, substitution, ellipsis, parallelism, repetition, synonymy, hyponymy, paraphrase, anaphora, transition and other lexical relations that link parts of the text (Grabe 2009, p.255; Crossley & McNamara, 2011 and Ozuru *et al.,* (2009, p.2). Therefore, cohesiveness of a text is one of the important factors that bring variety in a text. Ozuru *et al.,* (2009) show the importance of text cohesiveness as contributing in making academic texts coherent. Text cohesion changes the way in which adjacent sentences are connected and for a text to be coherent, it must have a balance of the temporal and causal sequence of the event of the text.

Texts should also have lexical cohesion. Berzilanovich (2008) describes lexical cohesion as the semantic relations between the lexical items in the text (p.2). It is important for students in the sciences to be aware of the structure of different texts written in science which impact on their reading of these texts (Lian & Seepho, 2012, p.2)). There is a strong relationship between cohesion and text coherence. Ozuru *et al.,* (2009), argue that the cohesiveness of a text determines text coherence and influences readers' understanding of text.

2.9.3 2 Coherence

Coherence is frequently described as:

> the extent to which a sample of language-use forms a unified whole and ultimately can best be judged impressionistically and not scientifically (i.e. quantitatively), as may be the density of cohesive devices used by a writer (Hubbard, 1993, p.56).

In addition to the above, Cooper (1988, p.353) views coherence "as the continuity of sense held in long term storage by the reader." The unified whole is referred to as the "semantic and pragmatic relations between texts parts". He claims that these texts parts are interpretable against the background of specific world's knowledge. This linguistically would mean that students should be aware of textual cues which bring relation between lexical items in language. Coherence deals with the reader more than cohesion. It checks on the flow of information in the text. Ozuru, Dempsey and McNamara (2008, p.2) argue that coherence in a text is brought by the overall organisation of the text and the readers' background knowledge.

2.9.3.3 Discourse

Gee, in van Schalkwyk (2008, p.29) assert that discourse is a sort of identity kit which comes complete with the appropriate costume and instructions on how to act, talk and often write so as to take on a particular social role that others will recognize. Discourse knowledge is important in academic reading as it involves the knowledge of how to speak and act in academic discourse (Boughey, 2010, p.281).The implication of the

above statement is that science students should have the discourse knowledge of their area of specific discipline, for them to understand the text structure and the cues that knit discourse and signal sequences in texts (van Wyk & Greyling, 2008, p.3). These cues are important for bringing in the text relations such as cause-effect, comparison, and contrast.

2.9.3.4 Grammar

Jung (2010, p.5) sees grammar as involving "the ability to identify syntactic role of words, dissects sentences into meaningful chunks, and recognize the syntactic structure of a sentence, to contribute to the construction of meaning from the text." The NBT (2014, p.38) shows an agreement with this aspect of grammar as it describes grammar as relating to the readers' abilities to understand and analyze the extent to which grammatical and sentence structures are organized in academic language and the extent to which these structures can affect and change meaning**.** Evens (2002, p.63) thinks that the teaching of grammar rules should not be in isolation but in context. He maintains that "conscious knowledge of linguistics rules does not necessarily go hand in hand with the application of these rules in production".

Ellis (2006) agrees with Evens (2002) that grammar should be in context. Evens (2002, p.91) claims that a "task-based approach that caters to the development of a proceduralised lexical system and simple, naturally acquired grammatical structures will ensure a threshold of communicative ability". This means that grammar should not be taught in isolation but in context through task-based activities. In academic reading, these could be science texts. Gee (2005, p.55) also is of the idea that grammar teaching should focus on the function, not the form.

2.9.3.5 Inference

Tracey and Morrow (2006, p.66) describe inference as "the process of filling in the meaning gaps. It is also known as reading between the lines." Inferencing skills rely on the use of high level language skills that help consolidate multiple propositions into integrated whole (Hogan, Bridges, Justice, & Cain, 2011, p.4). This means that students

should have the knowledge and the ability to apply their background knowledge to compensate for the new knowledge so that comprehension of texts can take place. According to Grabe (2009, p.79); Carrel *et al.,* (1998, p. 98), inferencing is one of the fundamental cognitive mechanisms that connect what we are currently attempting to understand with memory resources that provide our background knowledge (Tennet, 2015, p.65). Inferences are important in academic reading because Tennet (2015, p.66) view them as serving as links in activating the readers' prior knowledge. They are normally used by more experienced readers in linking up what they read with their pre-existing knowledge.

2.9.3.6 Metaphorical expressions

Boers (2000, p.1) defines metaphor as a fundamental cognitive ability that allows us to talk and think about abstract concepts and phenomena. The scientific language is more abstract and therefore students need the ability to encode the language for meaning-making purposes. Finatto (2010, p.1) describes metaphors as part of our everyday life. He views metaphors as "mechanisms of thought that is constantly used for communication among people and to the comprehension of the world." The nature of scientific language is metaphorical, and therefore students should possess the highest level of the word cognition skills for them to be able to read through science texts. They must be able to perceive language connotation, word play, ambiguity, idiomatic expressions, and so on. An important aspect of developing students' metaphorical knowledge is through activating their background knowledge.

2.9.3.7 Text genre

Hyland (2000, p.48) explains genres as:

> Internal linguistic criteria, grouping texts which have similar formal features. Spoken and written genres are seen as *narratives, recounts, arguments* and *expositions*, and each genre is composed of a series of stages which contribute to the overall purpose of the genre.

Graesser *et al.,* (2011, p.227) also argue that genre contains categories of a text, whether the text is a narration, exposition, persuasion or description. A contrary view is raised by Grabe (2009, p.259), who sees the text genre as depicting the goals of the writer, the purposes of the specific texts and the expectations of the skilled readers. Above all, Cheng (2006, p.77) describes genre as:

> both a cognitive and cultural concept, which is defined as the abstract, goal-oriented, staged, and socially recognised ways of using language delimited by communicative purposes, performed social (inter) actions within rhetorical contexts, and formal properties.

The above quotation implies that students in science should be familiar with the genre of science texts. Most of the genre in science require students to develop arguments, compare and contrast, and also to identify the cause and effect of ideas. Students need to be exposed to the relevant genre in science. Van Wyk and Greyling (2008,p.3) put an emphasis on the importance of text genre by stating that any reading course should assist with the development of strategic readers to focus on the systematic processing of textual features. In agreement, Negretti and Kuteeva (2011, p.96) state that there is a close link between genre awareness and metacognition. They describe genre awareness as the "rhetorical flexibility necessary for adapting socio-cognitive genre knowledge to ever-changing contexts." Graesser *et al.,* (2011, p.227) add that students should be trained to recognise genre and global text structures to help them to improve their comprehension of academic texts. This is one of the skills or strategies that the students who are admitted in Univen's SFP, lack.

Hyland (2006, p.41) attributes the following features to genre and sees the following metaphors as helpful in understanding genre:

- Frames for action: guiding principles for achieving purposes using language.
- Language standards: expected conventions of layout and language.
- Biological species: development of genres analogous to species change.
- Prototypes: instances of a genre are more or less similar to 'core' exemplars.
- Institutions: typified and interrelated processes and values of an institution.

- Speech acts: the conventional actions a genre is intended to perform.

Swales, in Hyland (2006) adds that these metaphors offer a rich and multifaceted view of genre. Familiarity with the text genre is considered important in academic reading because it may inhibit or enhance the understanding of the text. Readers must also be conversant with the non-textual information in the text which may also assist in the comprehension of a text. These, according to (Hyland, 2006), are part of the non-textual information which is there in texts;

- Graphic conventions. This will refer to aspects such as layout, punctuation, typeface, symbols, spacing an indentation.
- Reference Apparatus. This refer to aspects such as titles, index, introductions, abstracts, summaries, table of contents, footnotes, glossaries, appendices, blurbs on covers, author's biographical information.
- Non-verbal information such as maps, diagrams, illustrations, tables.

Touma (2012, p.53) notes that these textual features are important in academic reading, especially in science texts because students' familiarity with them can enhance their academic reading skills. This emphasizes the fact that familiarity with text structure and genre is vital for students' academic. Based on the above, it is also important for students to be familiar with expected tasks involved in reading scientific texts. These include arranging facts in order, separating facts from researches, taking most knowledge as accepted, and inferring knowledge using cohesive links. Jackson *et al.,* (2006) dispute some of the facts mentioned above by arguing that other texts, such as laboratory reports and manuals are also important sources for teaching reading. Another aspect which is important in academic reading is vocabulary and is discussed below**.**

2.9.3.8 Vocabulary

Ralenala (2003, p.209) sees vocabulary development as the use of context in order to decipher word meaning, picking out key words to make the text clearer, using a dictionary to find word meaning, and paying special attention to first sentences. Kibby, in Ralenala (2003) stresses on the importance of words as they are the visual and

auditory symbols that individuals use in communication to represent important ideas and concepts. Butler and van Dyk (2004, p.10) also acknowledge that the low proficiency levels in the language of learning is one of the factors responsible for students' difficulties in reading and writing, resulting in their inability to succeed at universities in South Africa.

Graesser *et al.,* (2011, p.224) see vocabulary knowledge as having a substantial impact on reading and text comprehension. One factor to consider in the vocabulary development is that the language used in sciences is quite distinct from the everyday language and this may be alienating to students (Fang, 2006, p.5). Fang (2006, p.6) observes that vocabulary in science language have the following features:

- It contains unique lexicon, semantics, and syntax.
- It allows scientist to conduct special kinds of semiotic and cognitive work, such as establishing clear links among claims, warrants, and evidence in order to develop scientific theories.
- It is used to communicate about scientific inquiries.
- It is more technical. These technical words are important in accurately conveying the specialized knowledge of science.

In addition to the above, Jackson *et al.,* (2006, p.14) opine that the language of science is specific, with specialized language patterns which involve abstract concepts and technical terms. In this regard, vocabulary development needs to be seen as a key factor in meaning-making (Prior, Golding, Shony, Geva, & Katzir, 2014, p. 3).This meaning-inferencing is termed lexical inferencing. Lexical inferencing is about inferring the meaning of unfamiliar words from the text (Prior *et al.,* 2014, p.3). The students' increased vocabulary in English might enhance their lexical inferencing in academic texts. It is from this backdrop that Jung (2010, p.4) views vocabulary as a prerequisite for second language reading comprehension.

The implication of vocabulary knowledge in reading science texts is that students should be exposed to this specialized technical language in a particular discipline. This dictates

that students should understand the discipline-specific and general words in their subject content (Fang, 2006, p.18). Nation (2008) also emphasizes the importance of vocabulary in reading by insisting that students should be aware of four different groups of vocabulary. The group that is most relevant to academic reading is academic words, which are prevalent in all science subjects. Mawasha, in Ralenala (2003, p.26) found that one thing which causes students to fail is the lack of appropriate vocabulary in their field. Adding to Mawasha's views, Ralenala (2005, p.93) describes the presence of unfamiliar and unknown components and properties of texts as one of the factors which inhibits reading in science texts. This shows that vocabulary development is crucial in academic reading. Van Wyk and Greyling (2008, p.2), also refer to vocabulary knowledge as not only critical for reading, but also for academic performance and related background knowledge. Graesser *et al.,* (2011, p.224) add to the importance of knowledge of words in the science discipline "a student who has high quality lexical representation will have easy access to scientific texts than the one with less lexical representation".

2.10 REVIEW OF STUDIES CONDUCTED ON ACADEMIC LITERACY

Many studies have been conducted on academic literacy on students with different linguistic background. Dooey (2010) conducted a study entitled *Students' Perspectives of an EAP Pathway Program.* The study was about foreign students studying at an Australian University. The aim of the course was to prepare students for the mainstream studies. These students were supposed to learn in English which was not their home language. Students were put through a test in the first semester after the completion of the English Language Bridging Course (ELBC). The aim of the test was to find out what perceptions students had of their readiness to study in Australia. 150 overseas students studying on the ELBC were interviewed. A questionnaire was administered at the beginning of the semester to ascertain the demographic details of the cohorts. Students were also interviewed on their experiences of the course.

The findings from the study were that students' home language had a great influence in their studying of English. Most Chinese students had problems because they

communicate in their home language during class debates. This indicates that there is a need for formal English course (reading, writing, speaking, and listening) for them to succeed in their academic world.

Braine (2002, p.59-68) conducted a review of previous studies conducted on Taiwanese students at an American university. The students were put through an English programme of dissertation writing. From this study, Braine (2002, p.9) discovered that academic literacy is an important component of business writing; he notes that:

- Writing is a major component of graduate business course and plays a role in testing.
- Writing assignments in the business courses contained detailed, highly structured instructions.
- Global features of writing are considered more important than the local features.

Foster (1996) also carried out a study on 551 students at the University of Cape Town. The purpose of the study was to learn about students' linguistic and educational background which could affect learning in other courses. Students were requested to write essays in which they would apply what they were learning in their Second Language Acquisition module to their personal experience, using either a narrative or discursive mode. The findings from the study were that students displayed greater interest and enthusiasm for this essay than the former which was more text related. The pass rate for the essay was about 70% (Foster 1996, p.84).These results indicate that students had only Basic Interpersonal Communication Skills (BIC) as they were free to narrate their experiences but found it difficult to read academic texts. Their performance in reading texts of other courses was below par, at 25%.

The above results therefore indicate the need for a specialized English course for the first-year entering students. Some of the findings from the study also indicated that:

- Students do have contact with English speakers of the language.

- There are varying attitudes towards English as a L2
- There is a relationship between L2 acquisition and academic literacy.

In this regard, the study suggests that the manner in which students acquire a second language is one of the factors which affect students' subsequent learning and writing. It was also found that students are also reluctant to express themselves in class because of limited proficiency in the language of learning.

Another study by Chimbganda (2011) indicated that students have the pragmatic ability to speak, but lack the organizational competence. This is indicative that students need an exposure to more writing activities for them to be fluent and accurate.

In yet another study on academic literacy, Nam and Beckett (2011) investigated five (four doctoral and one master) Korean ESL graduate students' access to and utilization of professional and social resources in the process of socializing into American academic writing discourse. Students were interviewed over a period of four months. Resources such as the writing centre, an ESL program and research courses were designed to help them. The findings showed that it was difficult for them to socialize into the American academic writing discourse because of their language status.

These students found it difficult to access the cultural knowledge that plays a crucial role in their language socialization and they were not often able to produce contextually adequate texts in the American culture (Nam & Beckett, 2011, p.2).This could be based on the fact that these languages are not mutually intelligible and students have a gap in terms of what they bring to the academy and the expectations from the academy (Nam & Beckett, 2011, p.2). Van Schalkwyk (2008) also alludes to the problem of students not being able to perform in academic tasks. She puts the blame on language, socio-economic status or cultural background as the areas having an impact on the interpretation of academic tasks. This problem is related to the problem of students not being able to read and write in a critical and analytic manner, to discern

between fact and opinion, to recognize what is deemed evidence for an argument and to grasp the discourse of the discipline (van Schalkwyk, 2008, p.2).

Rose, Chivizhe, McKnight and Smith (2003) attempted an exploration into scaffolding academic reading and writing at the Koori Centre. The study was about providing access to tertiary students for Indigenous Australians were historically excluded from higher education. Most of these students had problems with reading complex academic texts requiring high levels of understanding or critical analysis (Rose *et al.,* 2003, p.42).

These students were put through a scaffolding program where they were expected to structure their own essays appropriately by using academic conventions to demonstrate their mastery of a topic or inform and influence their readers (Rose *et al.,* 2003, p.42). The findings from the study portrayed that there was an improvement in the students' summary writing. Students were able to organize their essays, use information from the readings, analyze and discuss this information using the objective style of academic language to express their judgments (Rose *et al.,* 2003, p. 47). Students were more willing to participate in class, express their own opinions, use analytic thinking and develop arguments (Rose *et al.,* 2003, p.48).

The results from the study also showed that scaffolding as an important strategy for teaching or equipping students with academic reading competencies. Rose (2005) designed a stratified model of language to try to account for the nature of reading complexities. The model indicated that reading and writing demands the recognition of and the using of language patterns at the following levels:

- At the level of the text, readers must recognize what a text is about and how it is organized, for example, sequences of events in stories, or as chunks of information in factual texts.
- At the level of the sentence, readers must recognize how words are arranged in phrases, and what each phrase means, such as who or what the sentence is about what they are doing, where, when, why and how.

Gilakjani and Ahmadi (2011) studied the importance of text familiarity in academic literacy**.** Their findings suggested that texts which contain culturally-familiar content schema are easier to process. They state that participants better understand and remember comprehension passages they are familiar with. This shows the importance of text familiarity in academic reading. Zarrati, Nambiar and Maasum (2014) focussed on developing text structure awareness knowledge among students. Students were put through a teaching on discourse structural signals. The results of the study demonstrated that metacognitive awareness of text structure and overt teaching of textual features facilitates students' reading comprehension.

A study on the importance of academic reading was done by Arkash and Hamputlu (2014) aimed at finding out the reading strategies of graduate-level English Foreign Learners (EFL) in academic reading materials. The findings from the study were that students need to be more experienced readers in academic reading as it forms part of their graduate programme.

Another research done by Li and Munby (1996) indicated the importance of metacognitive strategies in academic reading. Their findings gave justifiable claims that the participants evoked a variety of strategies in order to understand academic contextual materials. Henia's (2003) study focused on the exploration of how metacognitive strategy-training influenced students in declarative and procedural knowledge. The study indicated an effectiveness of the metacognitive strategy in improving students' familiarity with the reading of research articles. Henia (2003) further indicates that metacognitive reading strategies may be an effective teaching tool for science subjects. Students' processing of research articles was enhanced through the use of these metacognitive reading strategies.

Hong-Nam and Leavell (2006) also explored the overall language learning strategies of English students enrolled in the Intensive English Programme (IEP) aligned with the Cognitive Academic Language Proficiency (CALP). The findings of the study indicated that the IEP programme may be a prime contributor to the use of metacognitive

strategies. Kierman, Lawrence and Sanky (2013) investigated an assessment intervention strategy to engage first year students undertaking a core communication course at the University of Southern Queensland. Most of the students were from backgrounds where they were unfamiliar with the university and discipline-specific literacies. Students were put through a Preliminary Essay plan where they were introduced to writing strategies. The study indicated an improvement in students' marks. The relevance of this study is that the students' backgrounds are similar to that of the South African context. Most of the students admitted in universities in South Africa are from backgrounds where they were never exposed to different genres in discipline-specific fields.

A study on the relationship between academic reading and academic writing conducted by Negretti and Kuteeva (2011) indicated the importance of metacognition in both academic reading and writing. The emphasis on this link should be put on the teaching of the analysis of the rhetorical situation or task environment which then reflects on students' ability to write (Negreetti & Kuteeva, 2011, p.97). The metacognitive awareness of rhetorical and genre–relevant aspect such as appropriateness of topic, purpose of the text, audience expectations and effectiveness of argumentation which can enhance the students in their academic writing skills.

In addition to the above studies conducted on reading strategies, Boulware and Gooden (2007, p.1) indicated that reading strategies are important in leading to a better reading comprehension. Their study also indicated that metacognitive reading strategies significantly enhance students' academic attainment.

Mobalegi and Saljooghian (2012) investigated the existence of a relationship between explicit reading strategies and learners' understanding of cohesive devices in text. The findings indicated that cohesive devices and metacognitive strategies are important in academic reading. The teaching of these metacognitive strategies is therefore crucial for academic writing and reading. This affirms the notion that students should be exposed to different genres, especially in science to be successful in academic reading.

Ralenala (2005) conducted a study on the limitations of applying the four-known reading process models and also on the factors affecting the comprehension of science content when reading in ESL. His findings were that students should be made aware of the different text structures and specific language of the discipline in science (p.101). Each discipline has its own specific language or unique technical terms, symbols and formulas that permit scholars within that field to communicate effectively. The knowledge of the above skills and symbols can make students members of that discourse community.

Kendou and De Broek (2007) studied the effects of prior knowledge and text structure on comprehension process when reading scientific texts. Two experiments were used in the study: the think-aloud methodology and reading-time methodology. The study indicated that readers adjust their processing of texts as a function of the interaction between knowledge and text structure.

Smith and Swinney (1992) conducted a study on the role of Schemas in reading text. Their focus was on how students read on-line texts which are vague (without titles) and whether they are able to connect those texts with their background knowledge. The results indicated that schemas effect on-line comprehension.

Van Wyk and Greyling (2008)' study on developing reading in a first-year academic literacy course recommended that the reading programme should be both an extensive and intensive one. The intensive programme should focus on authentic texts which can expose students to a wide range of scientific texts.

Another factor which affects the academic reading abilities of students is their motivation. Huang, in Touma (2012, p.80) found that the learners were most willing to read when the:

- teachers were available to answer questions
- key points were highlighted clearly in textbooks

- reading skills were taught.

Students' background knowledge into the text also motivates them to read. AL is acquired over an extended period of time in a complex, dynamic, manner, and data from multiple sources - teachers, advisors, peer journal entries, prescribed and preference tests as well as written assignments (Braine, 2002, p.9). Boughey, in van Schalkwyk (2008, p.24) brings another version of what academic literacy is. She maintains that academic literacy involves knowing how to speak and act in an academic discourse. This means that students need to be given a chance to participate with (collaboration) others for them to develop the necessary competencies. This, chance however, needs to be given in a supportive way by the lecturer. This support given is referred to as 'scaffolding' by Rose *et al.,* (2003).

Ozumu, Dempsey and McNamara (2008) focused on the relationship between prior knowledge and the readability of a text. The findings of the study indicated a positive relationship between prior knowledge and the readers' performance on text comprehension.

2.10 SUMMARY

In conclusion, this chapter has reflected on academic reading with keen attention paid to the various approaches to academic reading and metacognition. Various studies conducted on academic reading were explored and the relationship between these studies and the current study are brought out as a kind of conceptual and theoretical framing. Major themes that would inform the discussion of the data arose and would therefore be made use of later in the discussions.

The following chapter will focus on the methodology applied in this study in investigating the academic reading skills of SFP English students.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 INTRODUCTION

The literature reviewed in chapter two presented various views on what reading, academic reading and academic literacy are. A deeper understating of the issues relating to academic reading is developed in the review of studies conducted. This chapter reports on the research design and the methodology used for this study, under the headings: approaches used, research design, unit of analysis, data collection instruments and analysis, and ethical considerations.

3.2 APPROACHES TO RESEARCH

In discussing the approaches to research, it is appropriate to first outline what a methodology is to a study of this nature. Secondly, it is necessary to see which design falls within this methodology. The discussion below would outline the concept of methodology first, then the research design and then approaches towards conducting this research.

3.2.1 Methodology

Winsker (2008, p.67) defines “methodology” as the rationale and the philosophical assumptions underlying a particular study, rather than a collection of methods, though the methodology leads to and informs the methods. It is based on the researchers’ philosophical outlook towards the world that he/she adopts a certain methodological approach in conducting his/her study. As a continuation, Winsker (2008, p.67) states that the choice of a methodology depends on what the researcher would like to discover in his or her study. Babbie and Mouton (2002, p.75) describe research methodology as the focus on the research process and the kind of tools and procedures to be used in conducting the research. A researcher’s knowledge of the distinction between a methodology and a research design assisted in the decision of which method to apply and which research design best suited the method.

3.2.2 Research

Kothari (2004, p.1) describes research as "a scientific and systematic search for pertinent information on a specific topic". He further states that:

> Academically, research involves defining and redefining problems, formulating hypothesis or suggested solutions: collecting, organizing and evaluating data; making deductions and reaching conclusions, and at last carefully testing the conclusions to determine whether they put the formulating hypothesis.

This is supported by Nunan (1992, p.7) who describes research as being concerned with an inquiry. The research as an inquiry consists of two components, which are product and process. Nunan claims that a process is about an area of inquiry and how it is pursued. The product on the other hand, is the knowledge generated from the process as well as the initial area to be presented. A research is conducted with a purpose of finding solutions to existing problems. In relation to this study, the inquiry is on Univen's SFP students' academic reading profiles, as stated in chapter one. In the course of investigating these student's academic reading profiles, the researcher adopted a mixed method approach (quantitative and qualitative), with the quantitative data influencing the qualitative aspect. The first part of the study is informed by the quantitative data obtained from the NBT statistics, while the second part utilized a qualitative approach of a case study (SFP students) by analysing the data on their profiles in designing an intervention strategy of activities (see appendix D).

The discussion below focuses on what the quantitative and qualitative approaches are in research.

3.2.3 An approach

An approach is defined as a paradigm which is a world view or perspective shared by groups of researchers who adopt the whole paradigm as the one true way to defend it in opposition to any other set of views (Arthur *et al.,* 2012, p.5). An approach may be summarily described as a way of conducting research. Kothari (2004, p.5) argues that there are only two known approaches to research which are qualitative and quantitative

and they can be combined into the mixed method approach; this approach informed this study. The mixed method approach described below was relevant for this study because of its nature of addressing both the statistical aspects and the results of the test in designing the intervention strategy.

A description of the mixed method approach will be done by focusing first on the composite parts - quantitative and qualitative approaches.

3.2.4 Quantitative Study

Quantitative studies are described as being concerned with the statistical aspects of a phenomena (Babbie & Mouton, 2002, p. 272). In view of this, Macdonald and Headlan (2016, p.6); Babbie and Mouton (2002) state that quantitative studies are more concerned with the quantifying of data and then generalizing from a representative sample from the population of interest. Kothari (2004, p.5) adds that quantitative data analysis is formal, rigorous and rigid and is characterized by subjective assessment of attitudes, opinions and behaviour (Kothari, 2004, p. 5).

One of the advantages of quantitative research is that it maximizes objectivity, replicability, and generalizability of findings. It is because of these characteristics that the researcher decided to adopt it in this study as this approach gives a fair objective analysis of data (students' reading profile) from the study. What also makes this design appropriate is the fact that the researcher's experience, perceptions, and biases are set aside, unlike in a qualitative research which is more subjective (Conrad & Serlin, 2011, p.149; Tashakkori & Teddlie, 2003, p.21).

3.2.5 Qualitative Study

A qualitative study is a research paradigm that focuses on social action as its departure (Babbie & Mouton, 2002, p.270). The social action is about the description and understanding of human behaviour. In addition to the above, Harwell, in Conrad and Serlin (2011, p.148) also share the view that the qualitative method focuses on discovering and understanding the experiences, perspectives, and thoughts of

participants. Qualitative research is then a collection of methods and techniques which share a certain set of principles or logic (Babbie & Mouton 2002, p.270). Conrad and Serlin (2011, p.218) view the qualitative study as being relevant when one conducts a study which is socially-oriented. One of the importance of qualitative research is that it leads to the understanding of a particular context within which the participants act and the influence this context has on their actions. In adopting this approach, the researcher wanted to develop an understanding of science foundation students' academic reading profiles so as to come up with an intervention strategy to enhance science students' reading levels. Furthermore, the qualitative study identifies unanticipated phenomena and influences or generates new "grounded" theories. Additionally, it leads to the understanding of a particular context within which the participants act and the influence this context has on their actions and to an understanding of the process through which events and actions take place. It also helps in the development of casual explanations of events in the study. This, it is through the qualitative analysis of data that the researcher was able to give a thorough explanation of students' performance in different academic reading domains identified by the NBT.

Qualitative research is said to be inductive in nature hence, a researcher can construct theories or hypothesis, explanations, conceptualizations, profiles from details provided by participants and on materials they have interacted with (Conrad & Serlin, 2011, p.148). Students' academic reading profiles were investigated in their own specific context, that is, in the Univen's SFP. This is consistent with Winsker (2008, p.75); Babbie and Mouton (2002) when they state that qualitative research is used when one wishes to understand meanings, interpretations, look at, describe and understand experience, ideas, beliefs and values within a particular context. This also emphasizes the relevance of the qualitative research design to this study.

The qualitative research approach has its disadvantages as well as disadvantages. One of the disadvantages of the qualitative research method is that researchers become imbedded in the study. They cannot detach themselves from the study by setting aside their own experiences, perceptions, and biases (Conrad & Serlin, 2011, p.149).

3.2.6 Mixed method approach

Johnson and Unwuegbuzie (2007, p.123) define the mixed method design as "a type of a research in which the researcher or team of researchers combine elements of qualitative and quantitative research approaches, for example, use of qualitative and quantitative viewpoints, data collection, analysis, inference, and techniques for the broad purposes of breadth and depth of understanding and corroboration".

Similarly, Clark and Creswell (2008, p.21); Arthur *et al., (*2012, p.148); and Johnson and Unwuegbuzie (2007) state that the mixed methods research is one that combines the qualitative and quantitative approaches into the research methodology of a single study or multi-phase study. This view is extended by Clark and Creswell (2008, p.195) who define mixed methods as:

> Involving the collection or analysis of both quantitative and/or qualitative data in a single study in which the data collected concurrently or sequentially, are given a priority, and involve the integration of the data at one or more stages in the process of research.

Tashakkori and Teddlie (2003, p.191), in agreement with Johnson and Unwuegbuzie (2007, p. 123) also describe the mixed method approach as a standard part of the method in each of the major qualitative/quantitative research designs. In addition to the above, Arthur *et al.,* (2012, p.147) describe mixed method approach as a:

> Combination of qualitative and quantitative approaches with the ambition to generate a more accurate and adequate understanding of the phenomena than would not be possible by using only one of these approaches.

The mixed method approach may be used when dealing with a single study that incorporates both the features of a qualitative and quantitative study (Tashakkori & Teddlie, 2008, p. 195). The above authors also state the importance of mixed method as allowing the research to develop as comprehensively and completely as possible. This means that such a study should attend to both the description of the data and the

statistical analysis of the data. The use of mixed methods has some advantages to the researcher in the sense that it may be used for:

- Testing the agreement of findings obtained from different measuring instruments,
- Clarifying and building on the results of one method with another method,
- Demonstrating how the results from one method can impact subsequent methods or inferences drawn from the results (Conrad & Serlin, 2011, p.151; Tashakkori & Teddlie, 2003, p. 21).

The researcher used the mixed methods approach in this research because he wanted to extract in-depth data on students' academic reading profiles, describe the profiles and then intervene through recommended activities. Denscombe (2013, p.138) postulates that the relevance of the mixed method lies in the fact that it is problem-driven. In other words, it seeks to find solutions to the existing real life problems which in the current case is the problem of SFP students' lack of academic reading skills. Through the mixed method, findings which are objective and unbiased were obtained and these helped the researcher in drawing inferences about students' academic profiles and the necessary intervention strategy.

The profiling of students' academic reading abilities was done through the administration of the NBT whose results/findings produced quantitative data about the reading domains. The description and analysis of the quantitative data on the domains in the NBT was done following a qualitative approach (case study) and in the designing of an intervention strategy to address students' academic reading weaknesses (see appendix 5).

Tashakorri and Teddlie (2003, p.152) outline the importance of the mixed method as being used for complementarity to assess and remedy overlapping but distinct facets of a phenomenon under study. It is through the mixed method approach that this study could initiate new directions for intervention based on statistical data from part one, the NBT results.

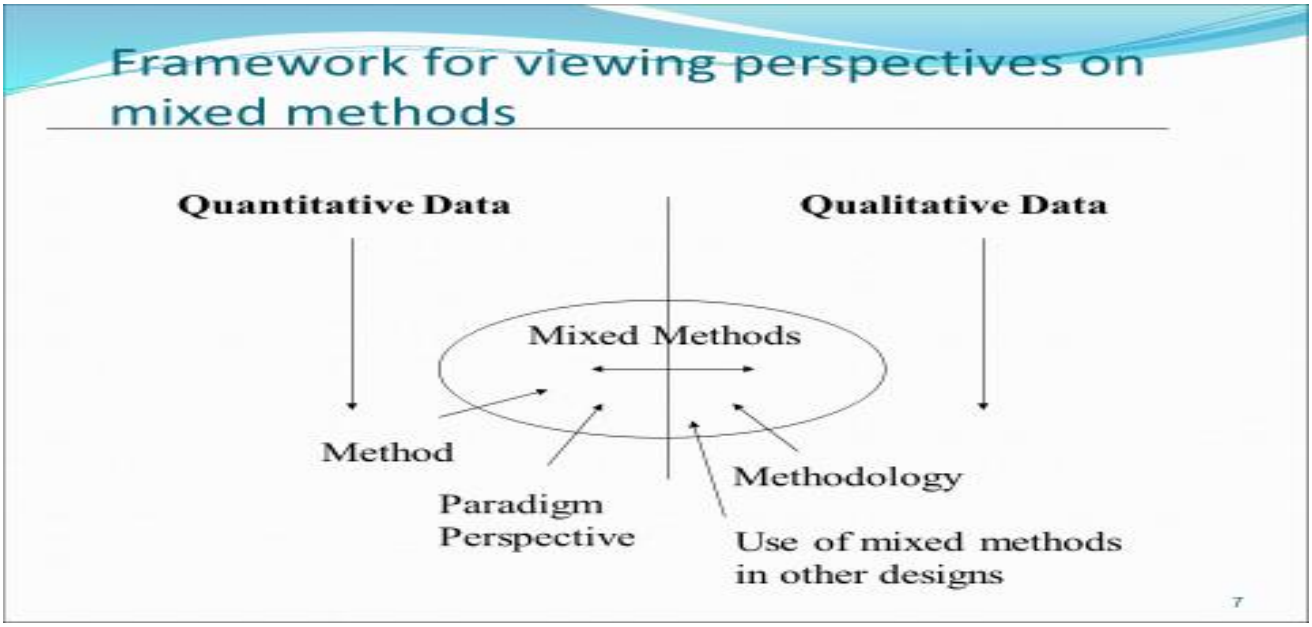

Fig 3.1 Framework for mixed methods (adapted from Creswell 2008)

The discussion on mixed methods may simply be illustrated through the use of the diagram above.

3.3 RESEARCH DESIGN

A study cannot be thorough without a research design. A research design belongs to a paradigm. Conrad and Serlin (2011, p.218) define a research design as an underlying scheme that governs functions developing or unfolding and the arrangements of elements or details in a product or work. Since a research design is normally influenced by a paradigm, Clark and Creswell (2008, p.7) define a paradigm as the worldviews or belief systems that guide researchers. Arthur, Waring, Coe and Hedges (2013) view a paradigm as a particular way of seeing the world. It is within a paradigm that a research design is located. A research design is "a plan, structure and strategy of investigation so conceived as to obtain answers to research questions or problems." This plan is the complete scheme or program of the research. It includes an outline of what the investigator or researcher does from writing the hypotheses, their operational implications to the final analysis of data (Kumar, 2005, p.84). A research design should aim at being valid, accurate and economical. Clark and Creswell (2008, p.159) view the importance of research design as providing a mind map for how to rigorously conduct

studies to best meet certain objectives for the investigation of academic reading skills of students in the foundation programme.

In light of this, the investigation adopted a case study research design (Babbie & Mouton, 2002, p.232) where the academic reading profiles of students are determined with the hope of coming up with an intervention strategy designed towards addressing the problem of academic reading (Babbie & Mouton, 2002, p.78).

3.3.1 Case Study

Arthur *et al.,* (2012, p.102) define a case study as "a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence." Arthur *et al.,* (2012); Kothari (2004, p.113); Babbie and Mouton (2002, p.281) all talk about a case study as an intensive investigation of a single unit. A single study may be an individual person, an institution, an event or a programme. The principal aim of a single unit is meant to determine either the cause of the problem or the reasons behind a certain behaviour (Creswell, 2003, p.15). The case stated in a study must be studied in relation to its specific context and the purpose is to explore a phenomenon which is not known or to describe something in detail (Arthur *et al.,* 2012, p.102). Nunan (1992, p.43) also sees a case study as utilizing a range of methods for collecting and analyzing data. A case study design puts emphasis on the full analysis of conditions and their interrelatedness (Kothari, 2004, p.113). Case study designs are often intended to suggest correctives measures to the phenomenon under investigation.

For the purpose of this study, the researcher applied a case study design in exploring the academic reading profiles of students admitted in the science foundation programme. The investigation is informed by the national concern (van Schalkwyk, 2003; Cliff & Hanslo, 2003; van Dyk 2014; Meltz *et al.,* 2007) that students admitted at some universities in South Africa are not competent in academic reading. The researcher, therefore, decided to use a case study design to investigate the academic reading levels of students admitted into the SFP English module. An intervention

strategy is hereafter designed with the hope of addressing the weaknesses in academic reading and to enhance the strengths available (see appendix 5).

A case study has the following characteristics:

- The researcher may take one single social unit or more of such units for his study purpose; he may even take a situation to study the same comprehensively. This means that the focus is on one instance of a phenomena which is studied intensively giving the researcher the opportunity to know the subjects and their behavioural patterns. In this study, the researcher decided to focus on the science foundation students because they have challenges adjusting to university studies because of their lack of academic reading skills. By studying them intensively, the researcher aimed at establishing their academic reading profiles with the aim of designing an intervention strategy to enhance their academic reading skills.
- The units selected is studied intensively. As this may consists of only one unit, there is enough opportunity for a researcher to have an in-depth extraction of data from the unit or the sample. This quality of a case study is what enabled the researcher to extract information on the students' academic reading profiles by administering a National Benchmarking Test. The researcher was able to identify areas where students needed support, for him to be able to design the intervention strategy.
- Through case study, the researcher is able to understand the complex factors that are operative within a social unit as an integrated totality. An understanding of these complex factors will help a researcher in coming up with structured remedies.
- There is an effort made to know mutual inter-relationship of casual factors. An analysis of these mutual inter-relationship factors also assisted the researcher to achieve the second part of the objectives of this study.

3.3.1.1 Location

The location for the case study is the University of Venda. Students registered for various science degrees in the School of Mathematics and Natural Sciences but did not make it into the mainstream, were registered in the SFP or extended degree programme. The University of Venda is located in the northern rural area of the Limpopo Province, bordering Zimbabwe. Most of the students registered at this University are from previously disadvantaged schools in rural villages.

3.3.1.2 Duration of the Test

The National Benchmarking Test was administered to Foundation English and Study skills module students for a three hours period from 08h00 to 11h00 in the morning. Students only sat for the Academic Literacy part of the NBT.

3.3.1.3 Population

The population was all first year science students enrolled through the Science Foundation Programme at the University of Venda. There were 100 students who registered for the foundation English module and all were purposefully sampled for this study. This type of sampling is also known as non-probability sampling.

3.3.1.4 Sample

Sampling is defined as “the process of selecting observations’ (Babbie & Mouton 1998, p. 192). Blanche, Durkheim and Painter (2009, p.134) define sampling as the selection of research participants from an entire population. The sample has to involve decisions about which people, settings, events, behaviours, and/or social processes. There are various types of sampling, for example, probability, non-probability and stratified but non-probability sampling was used in this study (Babbie & Mouton, 2002).

3.3.1.4.1 Non-probability sampling / Purposive sampling

Purposive sampling involves selecting certain units or cases based on a specific purpose rather than randomly (Clark & Creswell, 2008, p.203). It is also regarded as

non-probability sampling. Non-probability sampling is according to Kothari (2004, p. 76), a sampling procedure which does not afford any basis for estimating the probability that each item in the population has of being included in the sample. The sampling in this case was deliberately judgmental. Purposive sampling is described by Babbie and Mouton (2002, p.163) as a sample based on the knowledge of the population, its elements, and the nature of the research aims. De Vos, Strydom, Fouché, and Delport (2009, p. 329) also argue that purposive sampling involves making a critical assessment concerning the characteristics and attributes of the population, and then selecting the sample. Purposive sampling involves the deliberate selection of a particular unit of the universe for constituting a sample which represents the universe (Kothari, 2004, p.15).The researcher decided to purposefully sample the class based on his/her experience on having taught the class for a period of three years. The foundation English class was purposefully sampled in relation to the aim of the study, which was to determine the academic reading profiles of students. In this regard, Welman, Kruger, and Mitchel (2005, p.69) argue that when choosing purposive sampling, researchers should rely on their experience, ingenuity and/or previous research findings to deliberately obtain a unit of analysis in such a manner that that the sample obtained may be regarded as being representative of the relevant population. This is why the researcher relied on his experience of having taught the class to explore students' academic reading profiles. First year university students undertaking the extended degree program in the School of Mathematical and Natural Sciences were sampled. These are students who registered for Foundation English and Study skills module (FGS 1540 & 1640). Purposive sampling was therefore relevant for this study because it gave the researcher an adequate opportunity to have an in-depth study of the research participants in their natural setting, which is the foundation programme (Babbie & Mouton, 2002, p.189).

3.3.1.5 Data collection method

Data collection is a technique through which data is gathered from the participants. Mouton (1997, p.67) notes data collection involves applying a measuring instrument to the sample or cases selected for the investigation. In addition, Mackay and Gass (2005,

p.61) describe data collection as a process to uncover information about learner behaviour or learner knowledge. In collecting data for this study, the researcher applied the mixed–method approach where the NBT was administered to the SFP students.

The following section will describe the National Benchmarking Test as the instrument used in gathering quantitative data from the participants and then a description of the procedure in administering the test.

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3.3.1. 5.1 National Benchmarking Test

In collecting data for this study, the National Benchmarking Test (NBT) was administered to students registered for Foundation English and Study Skills (FGS) in 2015.

3.3.1.5.2 Administration of the test

As described under population (3.3.1.3), 100 students registered for the Foundation English module were sampled for the test. The researcher negotiated an entry into the field by requesting permission from the Head of Department for SFP and the Dean of the School of Mathematics and Natural Sciences. Consent forms were issued to students explaining about their rights to withdraw from the study at any time if they wish to, their anonymity and confidentiality status in the study. The representatives of NBT project from Thohoyandou, Vhembe District of Limpopo Province administered the test.
The National Benchmarking Test was not used to discriminate against students but to inform the researcher about students' reading profiles. The results from the NBT performance levels were analyzed and interpreted .Reading profiles of students were generated after analysing the test results (see chapter 4).

3.3.1.6 Data analysis

"Data analysis in qualitative research designs is heavily dependent on the researcher's analytic and integrative skills and personal knowledge of the social context where data is collected" (Bhattacherjee, 2012, p. 96). In light of this, data analysis therefore focuses on the meaning making or understanding of the phenomena being studied. The

following section describes how the data was analyzed with relation to the literature studied in chapter two.

In this study, the analysis of the results from NBT was done based on the academic literacy sub-domains as discussed in chapter two. These are: cohesion, coherence, discourse, knowledge of grammar, inferencing skills, metaphorical expressions, and text genre and vocabulary development. The test scripts were collected and sent to the University of Cape Town Centre for Academic Development, where they were marked and results analyzed following the laid down national procedures pertaining to all the NBTs in South Africa.

3.3.1.6.1 Descriptive analysis

Descriptive analysis is "providing profiles of companies, work group, persons and other subjects on any of a multiple of characteristics" (Kothari, 2004, p.114). The analysis may be in respect of one variable or two. The data analysis was done following the descriptive analysis. Students' performance in the NBT were analyzed based on the description of the expected level of performance per each academic literacy sub-domain in the NBT.

3.3.1.7 Intervention strategy

Arthur *et al*., (2010, p.137) define an intervention as "a deliberate attempt to change the world in some way with a view to assessing the impact of that intervention." In addition to the above, Wanzek and Vaugh (2007, p.2) explain the nature of intervention in reading as differing from typical reading instruction in that they are designed to address the instructional needs of students who are experiencing difficulties in reading. This description of the intervention strategy is appropriate for this study because students admitted in the foundation programme had experienced problems with regard to academic reading. The intervention strategy designed by the researcher is a standardized one. The intervention strategy is standardized as it is based on the academic reading domains which are explained in the NBT and other academic reading literature, for example Cliff and Hanslo (2003). Du Plessis and Gerber (2012, p.92) state that:

an intervention in this regard presupposes that a student who is able to master a predetermined set of learning outcomes in a conducive study environment with academic support, should have the potential to enroll in the normal degree programme.

Wanzek and Vaugh (2007, p.2) refer to a standardized intervention as:

> a specifying, *a priori*, the elements of reading instruction that will be implemented. These elements are selected based on the following:
> (a) An association with improved outcomes in previous studies;
> (b) A well-defined curriculum, and
> *(c)* Implemented by personnel who are trained specifically in the implementation of the curricula.

The proposal above stresses that intervention strategies should be standardized and focused. The research's second focus was on developing students' comprehension, vocabulary, cohesion, coherence, metaphorical usage of words and text genre analysis (NBT, 2014; Cliff & Hanslo, 2003; Weideman, 2003).

3.3.1.8 Ethical consideration

Winsker (2008, p.86) describes the aim of ethics as to prevent infringement on human rights, cause any kind of harm or reveal the confidential nature of individual participant's involvement. Ethics have to be taken into consideration in whatever research is conducted. One way of ensuring adherence to ethics is the completion of consent forms. Mackay and Gass (2005, p.43) view informed consent in data collection as the cornerstone of ethical practice in research involving human subjects. Winsker (2008, p.87) emphasizes the fact that where human subjects are involved, the participants should give their fully informed consent before taking part. It is therefore imperative that the researcher abide by these ethical rules in conducting this study. The argument put forth by Mackay and Gass (2005) is that informed consent gives the participants the right to choose what shall or shall not happen to them. An informed consent form should give more information about the research to the participants. It should also provide

participants with an opportunity to understand the subject of investigation (Mackay & Gass, 2005, p.61). In addition to the above, they also state that it should explain the issue of voluntary participation in the study and that the participants have the right to withdraw at any time.

The researcher negotiated entry into the field with the Head of Department (H.O.D) of the Science Foundation Department. Permission was also sought from the Dean of the School of Mathematics and Natural Sciences (see appendices A and B). Presentations were made at Departmental and School levels after which the ethical clearance to conduct the study was issued by the University Higher Degrees Committee. (*See appendix D*). Consent forms were distributed to students for their agreement in conducting this study (*See appendix C*).

The discussion of ethical concerns need to be considered with the issue of validity and reliability.

3.3.1.8.1 Reliability

Nunan (1992, p.13) explains reliability as the consistency of the results obtained from a piece of research. It deals with the extent to which a piece of research actually investigates what the researcher purports to investigate, in this case the academic reading abilities of students. Golafshani (2003, p.4) describes reliability as the extent to which results are consistent over time and an accurate representation of the total population under study and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable. Babbie and Mouton (2002, p.119) add on by indicating that the reliability of a test will deal with whether the test would yield the same results on other occasions. The NBT as a data collection instrument is reliable externally as many institutions (70 %) in the country use the NBT results for students' selection and admission (NBT, 2014, p.4).

The NBT is reliable because it provides critical information for teaching and learning for students already accepted or those about to be accepted at tertiary institutions. The AL

questions address domains relevant to the institutions of higher learning as reflected in studies conducted (Weideman, 2003). It has a high reliability as the test items are developed by teams comprised of academics from various institutions in the country (NBT, 2014, p.9). The NBT's reliability is assured as it goes through a transparent quality assurance process. Each test items is assessed by independent review panels for bias, fairness, content and construct.

The researcher viewed the NBT as the best instrument to use to measure the academic reading abilities of the Univen SFP science students.

3.3.1.8.2 Validity

Sebolai (2014, p.133) defines validity as "an inherent attribute or characteristic of a test, that a psychological real construct or attribute exists in the minds of the test taker." In simple terms, validity refers to an instance where a test measure what it is intended to measure (Weideman, 2009; Sebolai, 2014). Furthermore, Golafshani (2003, p.5) agrees that validity is "determining whether the research truly measures that which it was intended to measure or how truthful the research results are. Nunan's (1992, p.13) definition of validity also concurs with the above. Nunan says that validity has to do with the extent to which a piece of research actually investigates what the researcher purports to investigate. In relation to this study, the type of validity will be the construct validity. Sebolai (2014, p.14)' study on the NBT's validity found it not to have discriminant validity. This means that the test may be applied to all types of students, irrespective of where they come from and it will yield the same results.

The researcher has adopted the view by Sebolai (2014) as the one relevant for this study. Construct validity "refers to the extent to which evidence can be provided to prove that abstract knowledge, a skill or trait measured by a test exists" (Sebolai, 2014, p.5).This means that the NBT should measure what it purports to measure, which is academic literacy.

3.4 SUMMARY

This chapter described the methodology, research design, data collection instruments applied in the study, and also explained issues of ethical clearance and the procedure followed in conducting this study. The chapter which follows will focus on the results of the study

CHAPTER 4 RESULTS PRESENTATION AND ANALYSIS

4.1 INTRODUCTION

The previous chapter was on the research design and the methodology applied in collecting data for this study. This chapter is a report on the results of the study conducted on students in Foundation English and Study Skills module (FGS1540 &1640) in the Science Foundation Programme at the University of Venda. The aim of the study was to establish an academic reading profiles of students registered for the Foundation English and Study Skills (FGS) module in the SFP at Univen through the NBT and to design an intervention tool in response to the profiles. As explained in chapter three, the test was administered (see chapter 3.3.1.4) by the regional representatives of the NBT group in Vhembe District, Limpopo Province. Scripts were collected and couriered back to University of Cape Town for marking and analysis following the standard procedure for all the NBTs written in the country.

4.2 PRESENTATION OF RESULTS

The section below outlines the method used in the collection of data, presentation of results and a summary.

4.2.1 Data collection method applied

There were about 100 students in the Science Foundation programme registered for the module Foundation English and Study skills (FGS) who were purposefully sampled for this study. Of the hundred sampled, 58 were females and 42 were males.

The National Benchmark Test was administered in responding to one of the objectives of the study which is to investigate the academic reading profiles of students registered in the FGS module, in the Science Foundation programme. Touma (2012, p.73) acknowledges that there is currently little systematic profiling of readers at the higher education level. However, the researcher has adopted the profiling by Cliff and Hanslo (2003, p.30); Geber and Du Plessis (2009, p.23) as the ones representing nationally, the academic reading skills expected from students at tertiary institutions. An understanding

of students' profiles helped the researcher in designing an intervention strategy to enhance or address their reading weaknesses. The results from the NBT are presented in the table below:

Table 4.1 Academic reading sub-domains

Subdomain	Number	Mean	SD	Min	p25	p50	p75	Max
Cohesion	100	48.83	19.43	16.67	33.33	50.00	66.67	100.00
Communicative function	100	35.25	16.22	0.00	25.00	37.50	50.00	75.00
Discourse	100	28.14	15.79	0.00	14.29	28.57	42.86	71.43
Essential	100	37.80	14.33	0.00	30.00	40.00	50.00	70.00
Grammar/Syntax	100	32.50	18.86	0.00	16.67	33.33	50.00	66.67
Inference	100	34.93	14.14	7.14	21.43	35.71	42.86	71.43
Text genre	100	32.14	19.83	0.00	14.29	28.57	42.80	72.73
Metaphorical expressions	100	36.55	14.14	0.00	27.27	36.36	45.45	72.73
Vocabulary	100	52.67	17.36	16.67	41.67	50.00	66.67	83.33

The data will be presented in statistical and descriptive or narrative form. Data is first presented focusing on the reading competencies as described in the sub-domains, and then the academic literacies followed by the support of the data from the literature reviewed. In the reading competencies section, the presentation of data from sub-domains focusses on the different quartiles in terms of students' performance and the mean performance for each sub-domain. Students' performance in each sub-domain is placed on the Book and Whisker plot (see Fig.4.2). The literacy section focuses on the benchmark levels and students' performance in each benchmark level. Again, the

presentation also focuses on the general mean performance for the whole sample studied.

4.2.2 Presentation and summary of results

The descriptive data analysis (Kothari, 2004, p.114) was applied based on the academic reading subdomains as stated in NBT and from literature in chapter two. This data presentation first addresses the biographical details of the students who wrote the NBT.

4.2.2.1 PART A: BIOGRAPHY OF PARTICIPANTS

The following section tabulates the biographical presentation of the participants in the study.

Table 4.2 Biographical presentation of participants

GENDER	FREQUENCY	PERCENTAGE
FEMALE	58	58.0
MALE	42	42.0
TOTAL	100	100.0

Of the 100 students who wrote the NBT, 58 were females who made up for the 58% of students and 42 were male, who made up the remaining 42% of the students enrolled in the programme.

The biographical information of students is presented graphically in the following way:

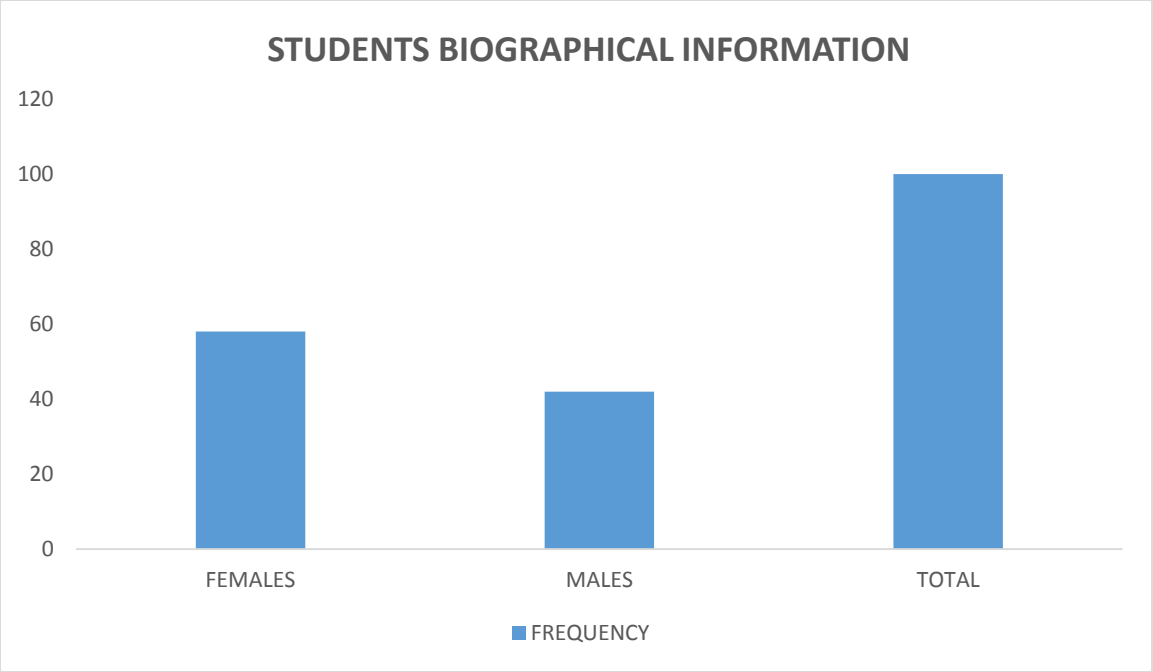

Fig4.1 Graphical presentation of biographical information of students

4.2.3 Part B: Reading competencies

The following table focuses on the presentation of the results from the academic reading sub-domains. The results are first presented in the table below and the graphically in fig.4.3 below.

Table 4. 3 Sub-domain analysis

Subdomain	Number	Mean	SD	Min	p25	p50	p75	Max
Cohesion	100	48.83	19.43	16.67	33.33	50.00	66.67	100.00
Communicative function	100	35.25	16.22	0.00	25.00	37.50	50.00	75.00
Discourse	100	28.14	15.79	0.00	14.29	28.57	42.86	71.43
Essential	100	37.80	14.33	0.00	30.00	40.00	50.00	70.00
Grammar/Syntax	100	32.50	18.86	0.00	16.67	33.33	50.00	66.67
Inference	100	34.93	14.14	7.14	21.43	35.71	42.86	71.43
Text genre	100	32.14	19.83	0.00	14.29	28.57	42.80	72.73
Metaphorical expressions	100	36.55	14.14	0.00	27.27	36.36	45.45	72.73
Vocabulary	100	52.67	17.36	16.67	41.67	50.00	66.67	83.33

The column for sub-domains represents the academic reading subdomains which students are profiled on in the NBT. The discussion on these subdomains is in the subsequent section in chapter four and full discussion on their performance in chapter five. The column on the mean is for the average performance in each sub-domain. The following column “SD” is for the standard deviation of the students’ performance in each domain. The three Ps’: p25, p50 and p75 are the quartiles of students’ performance in terms of percentages. The “min” is for those who obtained the minimum percentage and the “max”
is for those who obtained above the p75 quartile.

The above students’ performance is illustrated in the following graph

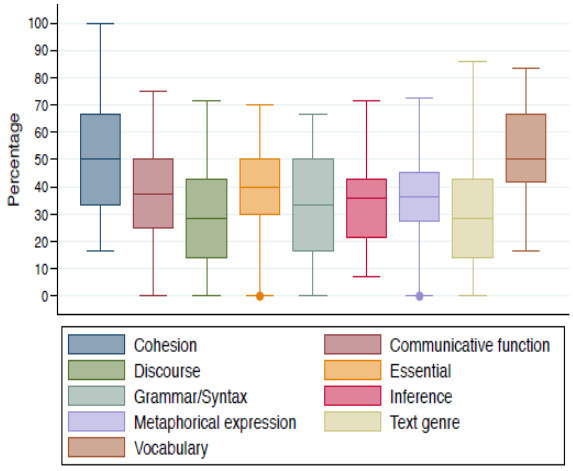

Fig 4.2 *A Univen 2015 AL sub-domain ranges(n:100)*

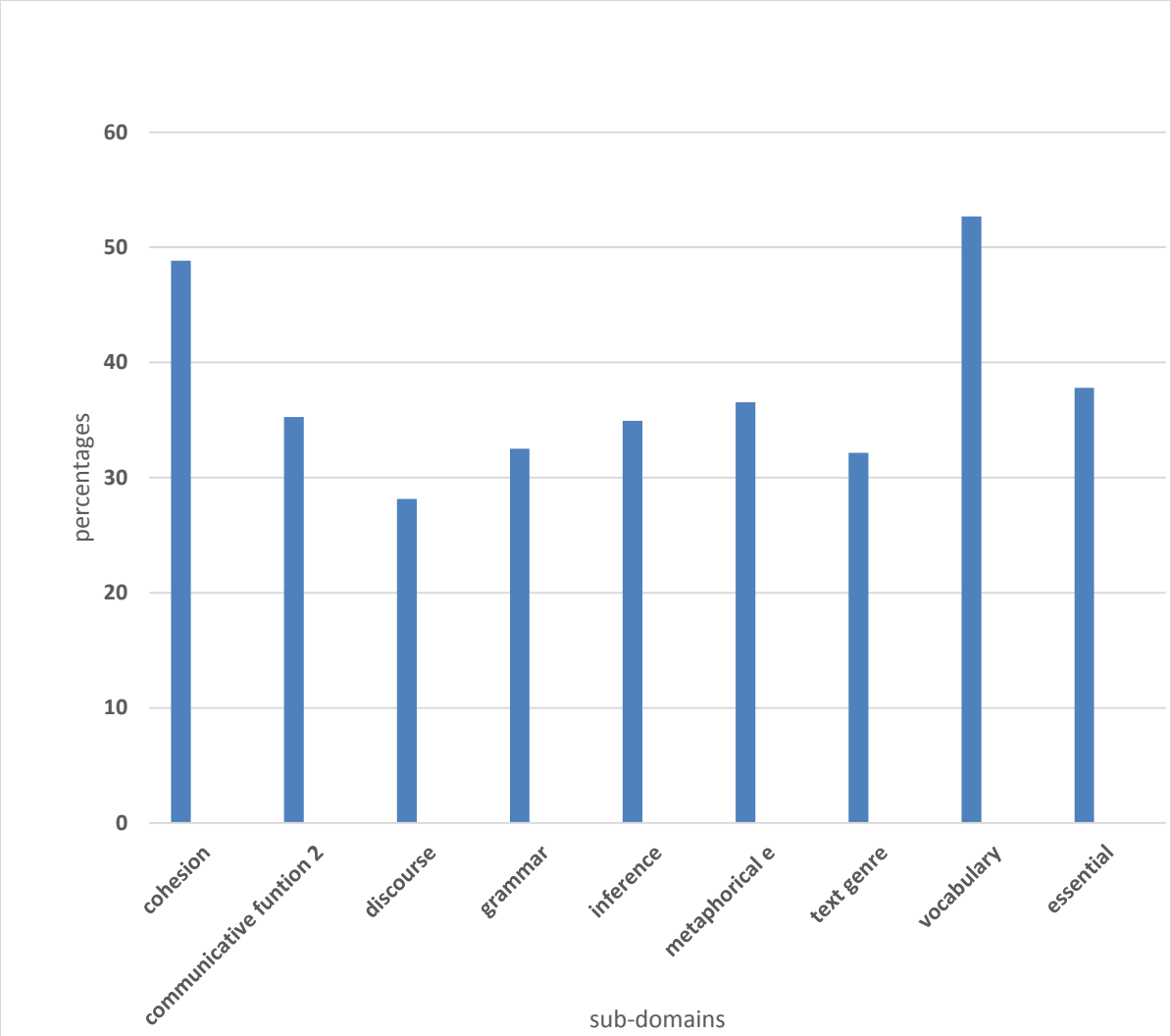

Fig 4.2 UNIVEN 2015 AL Sub-domain ranges (n=100)

The Figure 4.2 above represents students' performance in each sub-domain in respect of their mean performances. In the sub-domain of cohesion, students' mean performance is at 48.30; the performance for sub-domain of communication function is at 35. Students' performance for sub-domain of discourse is at 28.14; Students' performance at the sub-domain of essential is at 37.80. At the sub-domain of grammar or syntax, students' average performance is at 32.50 percentage. The sub-domain of inference has shown a percentage of 34.93,while a the one for metaphorical skills has

shown the percentage of 36.55.The sub-domain for text genre indicated a performance of 32.14 while the one for vocabulary indicated a 52.67 percentage.

4.3 DATA PRESENTATION ON ACADEMIC READING COMPETENCIES

The section which follows explains the data on the students' performance on academic reading competencies.

4.3.1 Cohesion

As discussed in chapter two (2.8.3.1), cohesion is the use of language connectors as a "cuing system" to refer the reader back and forward across sentences (i.e. inter-sentential) to elements occurring in the text. As such, the internal relatedness of a text (cohesion) assists the reader to process and ideate a coherent understanding of the writer's main propositions (Berzilanovich, 2008).

An example of a test item assessing cohesion follows:

Scrambled sentences

The sequence of the sentences in the following has been altered. Say what the correct order is by stating from 1-5.

Using biomass and bugs to create synthetic rubber

A. One of these petroleum by-products is isoprene, which is used to make the synthetic rubber in car tyres.
B. This means that oil (as much as 26 litres) will no longer be required to manufacture the synthetic rubber in them.
C. Oil does not just provide the fuel that powers the internal combustion engines in cars.
D. Now a way has been found to make greener tyres by using genetically modified bugs to produce isoprene biologically.
E. The by-products of oil are also the basis of many of the materials from which cars are made.

(adapted from ICELDA (Inter-institutional Centre for Language Development and Assessment 2011)

1. Which sentence did you put first? *A B C D E*
2. Which sentence did you put second? *A B C D E*

3. Which sentence did you put third? *A B C D E*
4. Which sentence did you put fourth? *A B C D E*
5. Which sentence did you put fifth? *A B C D E*

In this domain, students' performance is at a mean of 48, 83. Of the 100 students, 16.67 % performed at the minimum level of below 25%, and 33.33% performed at the first quartile level of 25%. 50% of these students performed at the second quartile level of 50%. 66.67% of these students performed at the last quartile level of 75%. There is a 25% of students who performed at the maximum level of 100%.

4.3.2 Communicative function

Communicative function refers to the ability and understanding of information as stated in texts. It deals with the knowledge of discourse in texts (NBT, 2014, p.23). An example of a test item on communicative function is as follows:

All water molecules form six-sided structures as they freeze and become snow crystals. The particular, virtually unique, crystal shape is determined by temperature, vapour, and wind conditions in the upper atmosphere. Snow crystals are uniformly symmetrical because these conditions affect all six sides simultaneously.

1. The purpose of the passage is to present
A a personal observation
B a solution to a problem
C factual information
D opposing scientific theories.

In the NBT, out of a total number of 100 students, the group had a below average performance at a mean of 35, 25%, with a standard deviation of 16.22%. 25% of students performed at the level of the first Quartile, which is 25%. 37.50% of students performed at the second Quartile of 50%, and 50% of students performed at the last Quartile of 75%. The students' performance in this sub-domain is partially satisfactory.

4.3.3 Discourse

Discourse is described as a text which is peculiar to a discourse community. In the case of this study, this means that the text read should be related to the discourse of science. An example of a test item related to discourse understanding is as follows:

Read through the following passage and then respond to the questions based on it.

A recent study conducted by British zoologists concludes that, like birds and other animals, human beings possess a "homing instinct". The study showed that this homing instinct or natural sense of direction is based on some kind of perception of magnetic fields. When blindfolded students who otherwise displayed an effective homing sense were made to wear helmets containing magnets, they became disorientated.

A) magnets in the helmets interfered with their homing sense
B) blindfolds prevented them from seeing their surroundings
C) effectiveness of the homing sense declines over time
D) the helmet, by covering their ears, interfered with their hearing

The results in this domain indicated a low performance by students at an average of 28. 14, with a standard deviation of 15, 79%. Of the 100 students, 14.29% performed at the first Quartile level of 25%. 28.57% of students performed at the second Quartile level of 50%.and 42.86% of students performed at the 75% level. The number of students who performed at the first Quartile level is significant. This may be because of their background of not being underprepared for university studying as implied by the literature studied (see chapter 2). The performance in this sub-domain is not satisfactory because of the high number of students who performed at the first and the second quartile.

4.3.4 Essentials

Essentials refer to students' ability to 'see' main ideas and supporting details; statements and examples: facts and opinions; propositions and their arguments; being able to classify, categorise and 'label' (NBT, 2013, p.13).

An example of a test item on Essential is as follows:

Structures in the inner ear called "the labyrinths" regulate posture by sending signals to the brain indicating our position in space from moment to moment. When the labyrinths are not functioning properly, because of a virus (viral labyrinthitis0 or other infection, or because their bold supply is reduced by arteriosclerosis of the arteries feeding them, the result is dizziness or vertigo. Such an attack is often so sudden that the victim may not even be able to raise his or her head off a pillow. The viral usually follows a cold and clears up in a few days.

4.3.4.1The passage suggests that when the labyrinths malfunction for more than a few days, the cause is likely to be

A) a severe and long-lasting cold
B) a sudden attack of viral labyrinthitis
C) a non-viral infection or a reduction in blood supply
D) a viral infection other than viral labyrinthitis

4.3.4.2 The primary purpose of the passage is to
(A) explain the structure of labyrinths
B) present some effects of viruses on the functioning of the arteries
C) distinguish between viral infections and arteriosclerosis
D) describe what happens when labyrinths do not function as they should.

Students' performance in this domain is at 37.80%, with a minimum of 0.00%.Students who performed at the 25% Quartile mark are at 39% and those who performed at 50% Quartile mark are 40%. There is 50% of students who performed at 75% Quartile. Students 'performance in this sub-domain indicate a normal distribution or performance.

4.3.5 Grammar/Syntax

Grammar, as discussed in chapter two (NBT, 2014), involves students' abilities to understand and analyze the extent to which grammatical and sentence structures are organized in academic texts. The ability to know how texts are structured and how the science diction is used in science texts will also enhance students' academic reading abilities.

An example of a test item on grammar is as follows:

The problem with private car sales is that the risks involved are great for both parties…as a buyer, you run the risk of buying a lemon, and sellers face the risk of not getting their money.

The punctuation mark that is missing where the dots are in this sentence should be a:

A full stop

B comma

C colon

D hyphen

In this domain, students performed at an average of 32, 50 %. The number of students who performed at Quartile one is 16.67 %, and those who performed at Quartile level two is 33.3%. 50% of students performed achieved at level Quartile 3. The performance is not satisfactory.

4.3.6 Metaphorical expressions

Metaphorical expressions are defined as "mechanisms of thought that is constantly used for communication among people and, moreover, to the comprehension of the world" (Finatto, 2010, p. 1). This means that students should be able to read through texts which will challenge their thinking for comprehension to take place.

An example of the test item in this domain is as follows:

"When they look at me, I'm glass."

The word "glass" here implies that the person is:

A. fragile

B breakable

C precious

D invisible

Students' performance in this domain indicated a mean of 36.5 %. 27.7 % of students performed at the first Quartile of 25%. 36.6% of students performed at the Quartile level of 50% while 45.45 % of students performed at the last Quartile of 75%. 72.73% of students reached the maximum of the percentage.

4.3.7 Inferences

Inference skills are described as 'comprehension monitoring' by Ralenala (2003, p.208) who views comprehension-monitoring strategies as of primary importance to good readers. The reader is required to interact mentally with a text by applying metacognitive reading strategies, to examine and analyse the material he /she is reading and to compare and contrast the text he or she is reading.

An example of a test item in this domain is as follows:

4.3.7.1. The fighters' immediate interests are with pro-Western governments and their involvements in new democracies, and the bringing down of these in the pursuit of new dispensations.

The word "*these"* in this sentence refers to:

A immediate interests

B pro-Western governments

C their involvements

D new dispensations

Students' performance in this category is at the average level of 34, 5, which is lower than the expected performance of students at this level. The performance is not satisfactory.

4.3.8 Text genre

Halliday, in Hyland (2000, p.48) defines genres as “internal linguistic criteria, grouping texts which have similar formal features.

An example of a test item which assess text genre is as follows:

As energy costs rise and resources wane, people look to the Sun. Solar energy almost certainly will be a main source for heating buildings someday. Special roof panels that take in the heat have already been developed and are now in use. In average home, however, about one hundred tons of rock or several thousand litters of water are needed to store enough heat for release during dark hours. Recently an inventor has created a heat storage and transfer device, which can release heat as needed. It small size makes it a more practical tool than piles of rock or pools of water. The keys to the invention are small amounts of eutectic salt, which can store a large volume of heat, and a special technique for releasing that heat, as it is needed.

The invention described is a method for
A Both heating and cooling a house
B Regulating the energy flow
C Taking in heat during both light and dark hours
D Circulating hot water gradually

Students’ performance in this category is at the average level of 32, 14. There is a significance number of students in the last Quartile of 75% where they performed at 42.80%, followed by the 28.57 % of students in the Quartile level of 50%. The lowest is the 14.29% of students’ performance in the first Quartile of 25%. The highest maximum percentage is also representative of distribution of students’ performance in all Quartiles.

4.3.9 Vocabulary

Ralenala (2003, p.209) describes vocabulary development as using context in order to decipher word meaning, picking out key words to make the text clearer, using a dictionary to find word meaning, and paying special attention to first sentences. In this study, students showed an increase in their performance in the usage of vocabulary relevant to academic reading.

An example of the test item assessing vocabulary skills is as follows:

Read the following passage on urban immigrants to South Africa and then answer the multiple choice questions that follow:

1. *Not all immigrants to urban areas find successful employment immediately. Some individuals and families may suffer in slims for much more than one generation, and eke out a mere existence for much longer than anyone would wish for. It is true, nonetheless, that the horizons that open up for poor urban immigrants are wider than the conditions that limit the lives of the rural poor.*
2. *South Africa is not alone in receiving successive waves of immigrants. The USA is currently experiencing an influx of unprecedented proportions, and now has 27 million legal immigrants. More than a century ago, the foreign-born accounted for almost 15% of a then growing young population. Now their numbers have again risen to over 11% of the total population, and this proportion is rising. Not only are there more immigrants, but they also appear to be smarter than their native-born counterparts: some 3.3% of them acquire post-graduate and other degrees, compared with 2.2% of the native-born population.*

1. The word “horizons” in paragraph 1 refers to:

A unlimited spaces

B widened sights

C promising possibilities

D attainable goals

2. An antonym for the word “unprecedented” in paragraph 2 would be:

A unexpected

B controlled

C levelled

D stabilized

3. *Complete the summary below.*
Choose NO MORE THAN TWO WORDS from the text for each answer.

During the sixties and seventies, attaining huge muscles became more important than ***1*** *…….. or having an attractive-looking body. The first people to take up this new sport of body building had a background in calisthenics but the most famous practitioners became known as* ***2*** *…….. on account of the impressive size of their muscles. Drugs and mechanical devices were used to develop individual muscles to a monstrous size.*
Calisthenics then became the domain of ‘weaker’ people: females, children and those recovering from ***3*** *…….. . Much of the advanced knowledge about calisthenics was lost and the method was subsequently downgraded to the status of a simple, user friendly activity. Once a person became skilled at this, he would progress to* ***4*** *…….. .*
Currently a revival of calisthenics is under way as extreme muscle building can harm the body leaving it sore, out of balance, and in poor ***5*** *…….. .*

Students have registered the highest percentage of 52, 67, with a significance level of 66.67% at the third Quartile level of 75%.The performance in the first Quartile is also satisfactorily with a percentage of 41.67%. The maximum performance for this sub domain is 83.33%. The implication of this performance is that students have adequately developed the vocabulary knowledge used in academic texts. There is only a minimal intervention needed from the lecturer for these students.

4.4 SUMMARY OF FINDINGS ON THE DOMAINS

The results of this study indicated the majority of students performed at a basic level. Students' academic reading profiles showed with justifiable evidence that they do not possess the academic reading skills needed for them to succeed with their academic reading activities at different academic levels.

4.5 PART C: ACADEMIC LITERACY

This section present data on the academic literacy benchmark levels as per the students 'performance. The results indicate that a large number of students fall in the Basic (51%) band.

Table 4.4 Academic Literacy Benchmark Bands Levels Frequency %

Basic	51	51.0
Intermediate Lower	41	41.0
Intermediate Upper	8	8.0
Total	**100**	**8.0**

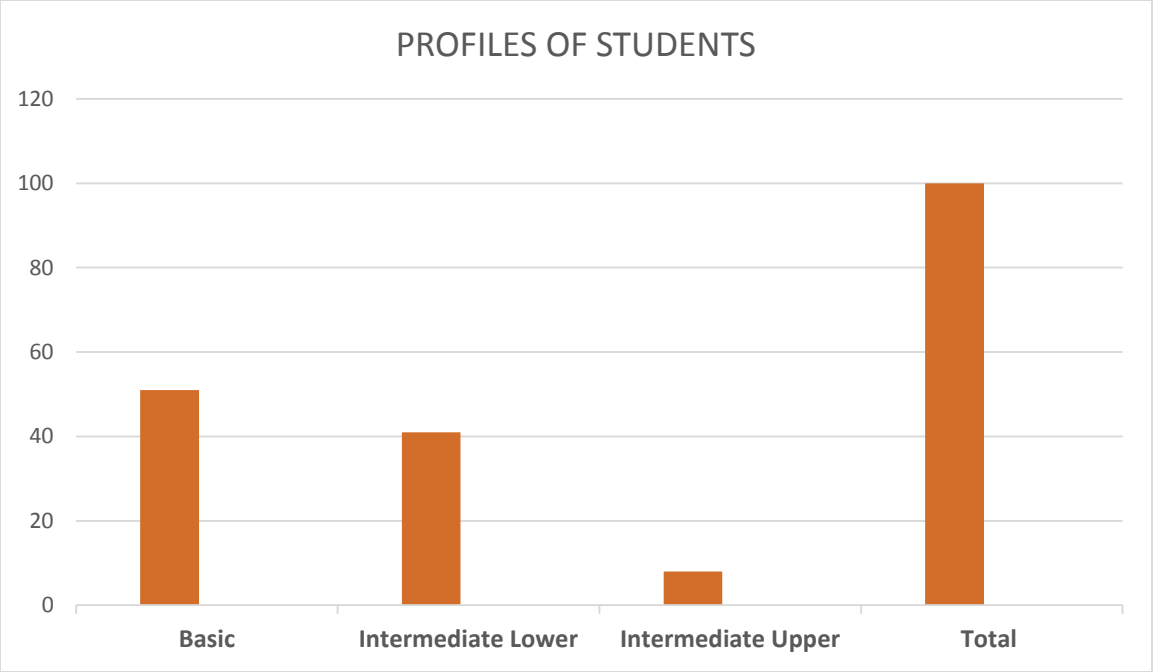

Fig.4.3 Presentation of academic literacy benchmark levels and students' performance in each level.

4.5.1The general students' performance

The general student's performance is at a mean score of 39.05.This means that generally students did not perform satisfactorily on the NBT. Various reasons might have led them to perform at this level. The students' performance is of average, which according to the NBT score level is intermediate. This indicate the justification for students to be placed in the Foundation Programme (NBT, 2014, p.11). Of the 100 students who sat for the academic literacy test, 51 obtained at the basic level, 41 at the intermediate lower level and 8 at the intermediate upper level. According to the NBT (2014, p.12), the basic level indicated students' performance as being a serious challenges. Students who register at this level require an extensive and long term support for them to cope with tertiary studies. 41 % of those who sat for the test achieved at the intermediate lower level. The implication of these performance is that students should be placed in an extended programme.

Students' scores were based on their achievement in the recognized academic literacy competencies as stated in International English Testing Service (IELTS, National Benchmarking Test (2014), Test of Academic Literacy and also set by Cliff and Hansford (2003).There were 26 percent of students who performed at the minimum level in the Book and Whiskers plot. Students who performed at the first Quartile of 25 % and below were at the level of 33 %.Those who performed at 2nd Quartile of 50 % were at 37 % and those who performed at the last Quartile of 75 % were at the level of 44 %.

4.5.2 Performance in benchmark levels

This section explains the levels of performance on the NBT.

(i) Basic level

In this benchmark level, students are struggling with the expectations of academic reading. Of the 100 students who sat for the test, the majority of them belong to the Basic level (51%).This means that they operate at a level where they experience serious learning challenges (NBT, 2014). They need an intervention programme which will take them through the process of becoming academically ready. The NBT (2014) describe students in this category as the ones suitable for admission at FET colleges. This tells that the majority of students, even though they are admitted at university, are not ready to meet the academic challenges at universities. The NBT (2014, p.7) describes students who perform at Basic levels as the ones who can:

- infer the overall purpose of text, which requires that they have to understand the overall point that the text is making.
- understand the basis by which concepts or processes are compared, by using analogy.
- infer a percentage by referring to a text.
- infer the meaning in context of a common, collogual idiomatic phrase.
- know the function of quotation marks as they apply to neologisms.
- understand the connotations of a common term in context
- understand communicative purpose to include giving examples of points.

These are the characteristics of students' performance in this category. The fact that the majority of students (51%) performed at this level shows that they are not ready for university studies. The researcher thinks that students who are admitted at universities, with a performance at this level should be put through a foundation programme where their basic language skills (as stated above) will be thoroughly developed.

(ii) Intermediate level

The intermediate level, as discussed in chapter two, is divided into two levels; which are the lower level and the upper level. Students who should perform at the intermediate level:

- know the meaning in context of a phrase.
- know the meaning of a common, colloquial term.
- draw from a known lexicon to identify/describe author attitude.
- extract and classifying essential meaning within a paragraph.
- know the function of quotation marks as they apply to neologism.
- understand the connotations of a common term in context.
- understand communicative purpose to include giving examples of points. (NBT 2014, p.8).

Students in the intermediate lower performed at (41%).The performance is above the minimum benchmark level of 38 % as stated in the benchmark table. This means that these students operate at a level where they experience challenges in domains of speciality, in this case, science. They need to be placed in extended degree programmes, like the foundation programme.

(iii) Intermediate upper level

The data presented indicated that only 8 students performed in the category of intermediate upper and this amount to only 8%.The implication of this performance is that only 8 students are capable of meeting the academic challenges when admitted at universities. However, they should be given some attention through the extended degree or foundation programme, like the ones who performed at the intermediate

lower. Students who performed at this level should be given opportunities to develop their interpretative language skills that will enable them to have illustrative skills. They should be exposed to argumentative skills where they will be able to establish the relationship between main points and their supporting detail in academic reading and writing.

4.5.3 Descriptive statistics

The following table will present data on the descriptive analysis of students' performance as per their number, mean, standard deviation, minimum, quartile 1 (25%),quartile 2 (50%),quartile 3(75%) and the maximum level.

Table 4.5 Descriptive statistics

	N	Mean	SD	Min	p25	p50	p75	Max
AL	**100**	**39.5**	**7.178**	**26**	**33**	**37**	**44**	**54**

The data above present the general performance of students in the NBT. There were 100 students who sat for the test. The general mean for the students' performance is at 39.5 %. Students' performance in different quartile levels is as follows: at the first quartile of 25%, students' performance is at 33%, 37% of students performed at the second quartile of 50% and 44% of students performed at the third quartile of 75%.There were 54% of students who performed at the maximum level of between 75% and 100%.

The descriptive statistics above may be presented in the following graph

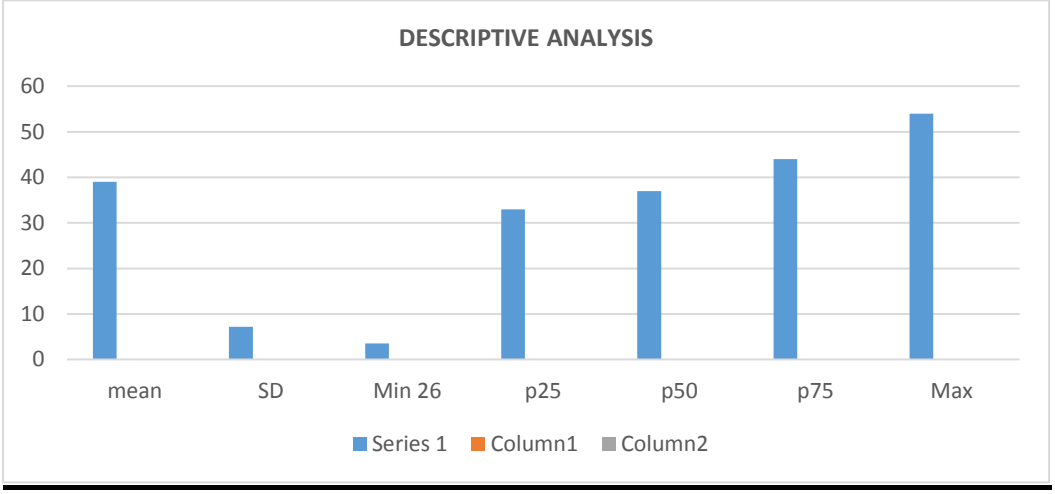

Fig 4.4 Descriptive analysis presentation

The above figure 4.4 presented students' results according to their performance in quartiles. The students' performance is placed according to the quatiles.i.e from the lowest quartile to the highest.

4.6 SUMMARY

In this chapter, the data was presented based on the categories of performance in AL and the subdomains in academic reading that were discussed in chapter three. The chapter also presented data on the general performance of students indicating their mean, standard deviation, minimum, performance in different percentage levels and the maximum. The results of the study indicated a need for students to be placed in the foundation programme in which their academic reading skills can be enhanced.

CHAPTER 5: DISCUSSION OF RESULTS

5.1 INTRODUCTION

The results for the study conducted were presented in the previous chapter. This chapter presents the analysis and discussions of the results. The purpose of this study was to establish the academic reading profiles of students registered for Foundation English module at the University of Venda and to design an intervention tool in response to their profiles. In course of the investigation, the following research questions acted as guides to the researcher:

- What are the competencies for academic reading?
- What are the academic reading profiles of students entering the Science Foundation programme?
- What reading intervention strategies can be provided to help students to succeed in academic reading according to the recognized academic reading competencies?

In the discussion of these results would therefore attempt will be made to respond to the questions above supported by the literature on the topic of academic reading.

5.2 SUMMARY OF THE PROBLEM

The research problem, as explained in chapter one, showed a situation of students admitted at institutions of higher learning showing a lack of academic reading competency (Lian & Seepho, 2012, p.1; Ralenala, 2003; Strydom, Mentz & Kuh, 2010). The problem was seen as widespread. This situation motivated the researcher to investigate the problem further with the aim of designing an intervention strategy that could be used to improve the students' academic reading skills (see appendix E).

5.2.1 Summary of the procedure

The researcher applied the mixed method approach in this study (chapter 3, 3.2.4) and the preferred design for this investigation was a case study which led to a purposive sampling. Students registered for the FGS 1540/1640 modules at the University of

Venda were purposefully sampled. The data were collected through the administration of National Benchmarking Test, which was sought from the University of Cape Town. A total of 100 students participated in the research. Of these 100 students, 58 were females and 42 males. All of them were registered for the Foundation English module and were therefore seen as the correct sample for the study. Proper procedure for obtaining permission from the H.O.D and the Dean of the School was sought for ethical clearance in administering the test. The test was officially administered by the regional representatives of NBT in Thohoyandou and sent back to the University of Cape Town for analysis.

5.2.2 Summary of the findings

These findings are presented in accordance with the research questions on investigating the academic reading profiles of students in the Foundation English module. The results from the test profiled students as Basic, Intermediate lower and Intermediate Upper. The following explains each level of academic literacy in terms of its demands, expected level of performance and students' results from the NBT.

5.2.2.1 Academic Literacy

The academic demands in each level as explained in chapter three are:

5.2.2.1.1 Basic level

The NBT (2014) (see chapter 2. 3,1.4) states that students with a performance at the basic level (0% to 40%) would have challenges of not coping with degree level study if they are not given extensive and long term support. The results from this study indicated that students' performance in the basic category is at 51% which means that only 51 students performed at this level. The general performance of students in the basic level at 51% is of a serious concern**.** This performance affirms the results from other studies that first year university students do not have academic reading skills (Yeld, 2003).

The outcome of this study is justifiable evidence that the majority of students are not ready for university studies (NBT, 2014). These students, therefore are correctly placed in the foundation or extended degree programme and that more attention should be given to these students so that they could perform at their expected level. In this regard, van Wyk and Greyling (2008, p.4) also notice the importance of offering extended degree programmes to students who are weak in academic achievement. Hart (2014, p.1) also highlights the dire situation under which our learners' reading levels at high schools is. From her stance, Baruthram (2012, p.2) also emphasizes the importance of reading skills seen in the statistics of students who get admission into universities with the challenge of not being able to read academically. The results from this study are also in line with the results of the study conducted by Nel and Nel (2009) who found that most of the students are reading at an average level of 53%, which is below the expected level of 65%.

5.2.2.1.2 Intermediate Lower

According to NBT (2014) (chapter 3.3.1), students who performed at this level will have academic challenges if admitted at tertiary institutions. There are 41 students in this category who performed at 41%. As in the basic level, the results indicate that students who performed at this level should be registered in the foundation programme and be given more attention in developing their academic reading skills. The implication of these results is that those at this level admitted at universities should be given necessary support through extended degree programmes.

5.2.2.1.3 Intermediate Upper

There are only 8 students who performed at this level, which translate to 8%. This indicates that majority of students registered in the foundation programme were not ready for university studies.

5.3 SUMMARY OF THE READING COMPETENCIES/SKILLS

The National Benchmarking Test administered contained the specific sub-domains which assisted in creating students' academic reading profiles. The construct of the National Benchmark Test is in accordance with Weideman's (2003, p.7) argument that when stating the competencies in an academic literacy test, there is a need to be specific to text creation. These competencies are the same as the sub-domains in NBT. The discussion which follows is based on students' performance in these domains (see table 4.1).

5.3.1 Cohesion

As discussed in chapter 2.8.3.1, cohesion deals with the surface level signals that effect the discourse organization of a text. Students are expected to be familiar with the cuing systems which are either inter-sentential or at the end of the text (Grabe, 2009, p.255). The NBT demands that students who are performing in this domain should be able to see how parts of sentences or discourse define other parts or are examples of ideas or are in support for arguments or attempts to persuade. Students' performance in this category indicated a mean of 48.8 %. Students' performance in this domain is evident that generally they struggle with analysing the relationship between texts. This means that students performed at an average level in terms of identifying cohesive devices from a text. The implication of these results is that students should be exposed to various academic texts to have the opportunity to practice reading science texts. This performance means that students are averagely able to detect cohesive devices from their texts or they are able to explain how these cohesive function within the text. This means that they are not able to use cohesive devices both in inferential and external opportunities to practice identifying cohesive devices from texts. Cohesive devices as in NBT affirm Anderson (2000, p.10) description of the importance of academic reading. These skill are:

- understanding relations within the sentence and
- understanding cohesion between parts of a text through grammatical cohesion devices.

- understanding relations between parts of text through lexical cohesion devices.

The above skills are important for students for making meaning from different texts. Students' performance indicated a standard deviation of 19.435 with a min of 16.67%. Out of the 100 students who sat for the test, 33.33% performed at the first Quartile of 25%. 50 % of the students performed at the second Quartile of 50 % and 66.67% of students performed at third Quartile of 75%. 25% of the students performed at 100%.

The average mean for the class in this sub-domain is 48.83%, which show that students performed averagely well in this domain.

This is one of the students' strengths in the academic reading skills. The implication of this strength is that conducive conditions should be created for students to reinforce the skill. Despite students' better performance in this domain, the concern is still with the 33 % who performed at the first Quartile of 25 % and the 16.67 % who obtained below 25%. Lecturers involved with students should work on improving students' performance to achieve at a level of 60 % and above. This shows the importance of cohesive devices in academic reading. The acquisition of these skills will enhance students' abilities in accessing information in texts.

5.3.2 Communicative Function

Communicative function refers to the students' ability to see or recognise the structure and organisation of discourse and argument, by paying attention-within and between paragraphs in text-to transitions in argument; superordinate and subordinate ideas; introductions and conclusions, in short, logical development (NBT, 2014).This means that students should be able to communicate information fluently relying on the cohesive devices which are in the texts. In this domain, students performed at an average of 35%. This is indicative of the low level of communication skills amongst these university students based on the idea that students are expected to be fluent in the language of learning and teaching. These results affirm the views of Halliday and Hasan (1989) on the role of the knowledge of text structure in communicative function of

the text. The performance of students in this domain also attest to the views held by van Dyk and van de Poel (2013, p.1) who purported that first year students experience a range of challenges when transferring from secondary to higher education. Some of the challenges stated are communicative problems. Chimbganda (2011) states the importance of communicative functions in academic reading. The findings of this study were that students lacked the organisational competence in communicating their thinking. The implication of this performance is that students should be exposed to activities which can help in developing their communicative skills, especially in science communication. This is in view of Yore (2000, p.5) who states that reading in science requires the students' knowledge of how science discourse is structured.This performance implies that students are not fluent in using the right discourse to communicate in science. They have not yet acquired the communicative competence needed for them to successfully read through science texts and present their thinking verbally or in written form. More exposure to activities which can foster students' communicative competence should be created in class. In addition to the above, Weideman (2003) views one of the competency to be met by academic reading students as being able to understand the communicative function of various ways of expression in academic language such as defining, providing example, and presenting logical arguments. This view is also related to the students' performance because they are not able to understand these functions in academic texts (Myburg, 2015, p.49).

5.3.3 Discourse

Knowledge of the discourse in science texts is described as the key to academic reading (van Schalkwyk, 2008, p.31). Ozuru, Dempsey and McNamara (2008)'s view on academic text knowledge is reinforced when analysing students' performance in this domain. Discourse knowledge relates to the application of the top-down approach (Grabe, 2009). Grabe emphasises that it is important for students to be familiar with the discourse in science for them to be able to make meaning out of different texts. It is however, regrettable that students' knowledge of the discourse used in academic texts is at its lowest percentage (28%). This shows that knowledge of academic discourse is a challenge to students. The researcher would like to recommend that students be

exposed to various scientific texts which can expand their knowledge of the discourse used in science for them to be full members of the science community. Students should be engaged in texts that expose them to cues which bring in the text relations such cause and effect, comparison and contrast. Students' performance in this domain is also attest to van Schalkwyk (2008) who found that students were not able to write in a critical and analytical manner. The implication of these findings is that more attention should be on developing students' discourse competence for them to be able to read academic texts. Students should be exposed to different types of genres which are rich in science discourse. This would be able to help them improve in their ability to read through texts which are science-oriented. Attention should also be put on discourse markers in reading comprehension courses (Khatib, 2011, p.4).

5.3.4 Essentials

According to the NBT (2014), essentials refer to readers' capacities to 'see' main ideas and supporting details; statements and examples; facts and opinions; propositions and their arguments; being able to classify, categorize and label. Students' performance in this domain is at 37.80 percent (see Table 4.1). This means that students should be exposed to various academic reading texts where they can practice to identify the main idea from supporting ideas and differentiating between propositions and arguments.

5.3.5 Grammar

The NBT (2014) describes the expected performance in this domain being the readers' capacity to understand and analyze the extent to which grammatical and sentential structures are organized in academic language, and the extent to which these structures can affect and change meaning. In this domain students are expected to show an understanding of grammar rules and sentence structures and how these contribute to meaning making in the text (chapter 2, 2.8.3.4).This tests the students' ability with grammar rules as explained in the NBT (see Table 4.1). However, students' performance is below expectations. Students' average performance is 32.5 %. This shows an improvement in students acquiring basic communication skills and text structure skills. It is however, still a point of concern for the performance of students in

this category. Even if students have achieved higher in the third Quartile at 50 %, there is still a need to develop students' knowledge of the language used in academic texts. Half of the students are still performing in the basic level (16.67%) and intermediate lower (33.3%) (see Table 4.1). This performance also implies that students' knowledge and use of grammar is low and much attention needs to be focused on developing students' grammar which is science-related. Students' performance in this sub-domain reinforces the thinking by Evens (2002) that grammar rules should be taught in context of the students' learning.

5.3.6 Inferences

NBT (2014) describes inference-making as the readers' capacity to draw conclusions and apply insights either on the basis of what is stated in texts or is implied. In this domain, students are expected to have the ability to infer knowledge for meaning-making. Their performance is at 34.9 % (see Table 4.1). This shows that students still need to work hard in developing their inferencing skills. The development of students' referencing skills is closely related to conceptualization in science reading (Tennent 2015, p. 69). Tennet (2015, p.71) maintains that the "successful comprehension of text is dependent upon the ability to relate different parts of text to each other". The acquisition of these skills can lead to coherent understanding of the text as a whole. This implies that students need to be exposed to texts and activities where they are able to make inferences out of the information they read into various situations in life.

5.3.7 Metaphorical expressions

Metaphorical expressions relate to students' knowledge of metaphorical language used in academic texts. Weideman (2003) and Foxcroft (2004) state that students should be able to interpret and use metaphor and idiom, and perceive connotation, word play and ambiguity (chapter 2, 2.8.3).

Students' performance in this domain is at a percentage of 36, 5. This performance indicates that students are performing below the expected average percentage of 65. The performance is contrary to the expectations of Weideman (2003) and Myburg

(2015) that students should be able to interpret and use metaphors and idioms or perceive connotation, word play and ambiguity. Metaphorical expressions demand that students should be able to think in an abstract form (Boers, 2000, p.1). Students' performance does not reflect the acquisition of this competency. The implication of this performance is that students' exposure to academic texts which are scientific in nature, can enhance their academic reading abilities In addition, this also implies that students should be exposed to various scientific texts, rich in metaphorical language, for them to acquire the skill of reading through condensed texts.

5.3.8 Text genre

Text genre is related to the knowledge of text structures and how they contribute to meaning-making. This is affirmed from literature studied that students should be acquainted with expository text structure (Zarrati *et al., (*2013, p. 54). Hart (2014, p.91) also states that students should be able to recognise text patterns at different levels (see chapter 2.4.4.2). Grabe and Stoller (2001, p.8) also put emphasis on the awareness of text structure in academic reading. This means that students should be aware of this important knowledge in their reading. Students' performance in this domain showed that they are weaker in identifying text structure. Their performance is at level of 32.1 %. The researcher concurs with what Hart (2014, p.14) is suggesting that students should be able to perform at the levels required (chapter 2.5.1). This performance also confirms what Shaffie and Nayan (2011, p.7) allude to as a problem to students who are not able to interact with the text because of lack of knowledge about the text structure. This performance indicates that students are not familiar with text genre in the science field. This performance also give some evidence to the outcries of Gilakjani and Amhadi (2011), Zarrati, Nambier and Maasum (2014) about students' lack of text structure awareness.

The implication of the above performance is that students should be exposed to different types of academic texts and have knowledge and skills on how to read and interpret them. This development will be in line with van Wyk and Greyling (2008, p.3) on the importance of knowledge of genre (chapter 2, 2.8.3.7) (Carrel *et al.,* 1988).

5.3.9 Vocabulary

Vocabulary development is regarded as a critical component of reading (Grabe, 2009, p.171). Vocabulary involves the use of words relevant to the scientific genre. A rich vocabulary in the science genre is necessary for one to be able to read through academic texts. Students' performance in this domain indicates that they have developed a rich genre-based vocabulary. Students' average performance is at 52% (see Table 4.1). Vocabulary development should be done through developing students' comprehension strategies (Ralenala, 2003, p.263). Students 'performance at 52% also relates to the application of bottom-up reading strategies without the knowledge of the appropriate science vocabulary. This suggests that these students might not be able to make meaning out of the text. This performance also is in line with Nation (2008) who observes that students should be exposed to various academic vocabulary used in science texts. The performance also attests to the thinking of van Wyk and Greyling (2008, p.2) that vocabulary knowledge is crucial for academic performance. The importance of vocabulary in the reading process is very crucial for students' reading. Its vital role is based on the premise that it serves as a prerequisite to fluent reading skills (Abisamra, 2006, p.6). The classrooms where activities are to be administered should be language-rich so that students can acquire the relevant vocabulary in their studies (science studies). Hasan's (2014, p.1) description of the bottom-up reading strategies also shows the importance of vocabulary knowledge in making meaning. The emphasis is on the individual words, the lexicon or vocabulary, semantics, syntax or grammar which make the text a whole.

5.4 METACOGNITIVE READING STRATEGIES

Various research on metacognitive reading strategies have indicated the importance of this on students' academic reading. Henia (2003) found that students' lack of awareness of meta-textual features led to a poor reading in the genre. The findings of this study are related to the present study. Students' performance in the metaphorical sub domain at 36.55% also indicate the lack of metacognitive reading strategies. Evens (2002) highlights the issue of lack of metacognitive reading strategies which led to

students being admitted at higher institutions being labelled as underprepared. Mobalegi and Saljooshian (2012); Boulware and Gooden (2007) indicate the importance of metacognitive reading strategies in academic reading.

5.5 ACADEMIC LITERACY

There are different views expressed on the nature of academic literacy. The fact that students' performance is not satisfactory affirms the view that academic literacy is acquired over a long period of time (Street, 2003, p.77; Braine, 2002, p.9). The requirement that students should be familiar with the text structure also affirms the view by Parkinson *et al.,* (2008, p.13).

The description of the NBT as being metaphorical is in conformity with the view that academic literacy is discourse specific. This very thinking is shared by Rose *et al.,* (2003) who argues that being a member of a discourse community, one becomes conversant with the abstract concepts and discipline specific technical terms.

The academic reading sub-domains are also consistent with the view of academic literacy Weideman (2003). Weideman (2003) view of academic literacy competencies also agrees with the academic reading demands students are faced with at tertiary institutions. The findings of this study are therefore a confirmation that without the knowledge of these competencies, students cannot succeed in their studies.

The findings from the NBT are in line with Foster (1996). Students' performance in the academic literacy test was at 25%, which indicate the importance of academic reading. In this regard, Yeld (2003) also asserts that there is a poor performance of students in the science first year level in six universities which appears to be consistent with the findings of the present study. These views are also shared by Weir *et al.,* (2005) and Grabe (1991). Touma (2012, p.106) adds to the difficulty facing students in academic reading by indicating that students often use ineffective and inefficient strategies in reading and this makes their reading unproductive. These students are therefore underprepared for university reading. The results of the study also confirm what van

Wyk and Greyling (2008) found in their study about the academic readiness of students entering higher education. The fact that majority of students in this study performed at the basic level (see 4.1) confirms the fact that students' academic reading skills are below the expected university entrance.

5.6 SCHEMA THEORY

The result of this study indicate a clear relationship between the schema theory and the strategies involved in the pre-reading stage. The importance of the application of the top-down reading strategies in the pre-reading stage is confirmed by students' performance in the text genre analysis. The awareness of the text genre requires a knowledge of different types of genre and the application of this knowledge in reading academic texts. The application of schema theory is also applicable in vocabulary knowledge.

5.7 SUMMARY

This chapter focussed on the discussion of the data presented in chapter 4. Results from the study were discussed drawing confirmation from the literature on academic reading reviewed in chapter two. Students' performance was discussed based on the identified competencies from the NBT.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTIONS

Chapter 5 discussed the results presented in chapter 4.This chapter draws conclusions in an attempt to come up with recommendations from the data. The analysis and recommendations were based on the data on academic reading profiles of students and their performance in the academic reading sub-domains. In this chapter, recommendations are made based on the interpretation of the results.

6.2 CONCLUSION

The NBT results revealed the level of students' unpreparedness when coming to the identified competencies of students admitted in SFP, on issues of cohesion, discourse, grammar, inference, metaphorical expressions, vocabulary, and genre (NBT 2014). Students' familiarity with these competencies is crucial for their academic studies. Students' performance at the basic level 51% (see Table 4.4), confirms what Jackson *et al.,* (2006); Bharuthman (2012);Cliff *et al.,(*2003) and Weideman (2003) found about the level of students when admitted at tertiary institutions. Zulu (2005) also confirms that the majority of students are underprepared. Despite the poor performances in some sub-domains, where the majority of students performed in the basic level, there are some levels where students' performance is satisfactory. These are competencies like cohesion (48%), where there is also a higher percent of those who obtained at 66.67% (see chapter 4 table 4.1). The researcher also acknowledges that these students are from disadvantaged schooling background, hence their academic performance. These results, therefore, necessitated the design of an intervention strategy with the purpose of improving students' academic reading skills and in general, their performance.

6. 3 RECOMMENDATIONS

The analysis and interpretation of the results from this study led to the following recommendations. The general recommendations from this study is that there should be a direct focus on inculcating the habit of developing academic reading skills of students.

This is because of the impact of academic reading skills in students' academic studying. In addition to the general recommendations, the researcher would like to make the following recommendations based on the literature conducted, the academic reading profiles of students as emanating from the results of the study, academic sub-domains, students' roles, lecturer's role and the designing of an intervention strategy.

6.3.1 Recommendations based on the reading theories

The following are recommended form the study:

6.3.1.1 Schema theory

The literature reviewed on the schema theory indicated how important the activation of the students' background knowledge is (chapter 2.2.1 and 2.3.1). The researcher would like to recommend that students be taught text structures and be expected to read through texts which are science-oriented. The teaching of academic reading should follow the linear programme of pre-reading, during-reading and post-reading. Strategies such as prediction and inferencing should be applied during the pre-reading stage. Students should also be able to detect the cause and effect of something happening, and compare and contrast issues in texts. Content schema is vital for academic reading because without familiarity with the content of the text, students cannot decipher meaning.

6.3.1.2 Metacognitive reading skills

Metacognitive strategies offer students the ability to reflect on what they have read. It is therefore important to develop students' metacognitive reading skills by exposing them to texts which are coherent and rich in diversity. Students should then be able to apply the metacognitive reading skills in their academic reading (chapter 2.11.1 and 2.11.4). The researcher is in agreement with Pammu, Amir and Maasum (2014, p.2) when they talk of the metacognitive skills which students need to acquire, for them to be actively involved in their reading. These skills are self-regulating strategies

In designing metacognitive reading strategies, Kamijo (2016, p.3) thinks that reading programmes should, *interalia*, include:

1. relating the text to their own lives,
2. determining which facts are important and unimportant,
3. summarising information,
4. filling in details and draw inferences
5. asking questions (see chapter 2)

6.4 ACADEMIC LITERACY LEVELS

The researcher strongly believes that students should be taught structured academic reading skills which would enhance their performance from the basic and intermediate level to the proficient one. The academic literacy skills should be contextual to the science discipline to enhance students' scientific knowledge in line with the requirements of the new literacy theory.

6.4.1 Academic reading subdomains or content

The NBT findings indicate that a significant number of students performed at the basic level (chapter 4, 4.2.3). Students' performance in the academic reading subdomains also indicated a weakness in performance in subdomains like Communicative Function, Discourse, Grammar/Syntax, Inference, and Text Genre. The recommendation would be that students should be exposed to the teaching of these domains in class.The content chosen for students should be a scientific text which reflects the academic reading subdomains such as cohesion, text genre, vocabulary development, inference and discourse. The academic reading competencies of Alderson (2000), Weideman (2003) and Foxcroft (2003) should be focused upon even at high school level. These should be taught to students to make them more acquainted with academic discourse (see chapter three, academic domains). Students should have ample opportunities to practice cause and effect and compare and contrast structures, as the above are conventions of all academic texts. The texts chosen by the lecturer should also aim at developing students' critical reading skills. In developing students' critical reading skills, texts should adhere to the appropriate levels to foster an active role in their acquisition

of academic reading skills. The activation of background knowledge rests with the students' mental readiness which relates with the application of metacognitive reading strategies.

The researcher agrees with Alderson (2000) on reading micro skills which students needs to familiar with and be able to do in their academic reading process. Micro skills in this context include:

- recognising the script of a language.
- deducing the meaning and use of unfamiliar lexical items.
- understanding explicitly stated information.
- understanding information when not explicitly stated.
- understanding the conceptual meaning.
- understanding the communicative value of sentences.
- understanding relations within the sentence.
- understanding relations between parts of text through lexical cohesion devices.
- understanding cohesion between parts of a text through grammatical cohesion devices.
- Interpreting text by going outside it.
- recognising indicators in discourse (Alderson, 2000).

6.5 LECTURER'S ROLE

According to the NBT (2014) discussed in chapter 3, students who become successful at universities are those who perform at the proficient level, which is from 64% to 100%. The results from this study indicate that no students performed at this level, and this is a great concern to the researcher. The results imply that all the students who registered in the foundation have academic reading challenges and therefore need assistance in developing their academic reading abilities. The implications of the above results are that students should be placed in the foundation programme and an intensive academic reading programme be put in place to develop their academic reading skills.

The successful activation of students' background knowledge requires someone who is skilled, qualified and knowledgeable about the academic reading skills. The lecturer developing academic reading strategies should create conditions conducive for students to make them competent to engage with the materials provided. The researcher also views scaffolding as a strategy which lecturers should employ to teach academic reading to their students (Street, 2003, Hart, 2014). The recommendation of employing scaffolding is based on Hart (2014)' scaffolding theory.

6.6 IMPLICATIONS FOR TEACHING

The researcher recommends that:

- Students be exposed to authentic academic texts, which will equip them with academic reading skills (Pretorius, 2006, Ozuru, Dempsey & McNamara, 2008, Hart, 2014).
- Students should be exposed to different text structures and how they are organised (Hart, 2014).
- Students should be taught monitoring strategies which hill help them in reading through different academic texts. These are strategies like vocabulary development, self-questioning, summarizing, and inferring the main idea of each paragraph, and identifying key words.
- The key academic reading sub-domains such as cohesion, inferencing, metaphorical knowledge, discourse knowledge, text genre should be directly taught to students.
- Metacognitive reading skills should also be taught to students, for them to to interact critically with various academic reading materials.

6.7 AN INTERVENTION STRATEGY

Students' performance in the academic reading sub-domains have been stated in chapter 4, and interpreted in chapter 5. In addressing students' weaknesses in academic reading sub-domains and their academic reading profiles, the researcher recommends that an intervention strategy needs to be developed. Arthur *et al.,* (2012), Wanzek and Vaugh (2007, p.2); Du Plessis and Gerber (2012) agree that an

intervention strategy is important in addressing instructional needs of students who have challenges or difficulties in attaining certain concepts in reading. In addressing the inadequate general and reading levels of the majority of students, Barutham (2012) recommends that an intervention strategy be developed. The researcher therefore has designed an intervention strategy designed (see appendix E) which would help in addressing the academic reading challenges identified in the study. The booklet designed might only serve as a guide towards enhancing students' knowledge and application of these skills in their process of academic reading. The intervention strategy can also attempt to address the issue of high failure rates in grade 12 with a view to reduce the dropout rate in schools and at universities in South Africa. Evidence from a study conducted found that 50 to 60 percent of students' drop out from their first-year degree studies (van Zyl, 2015). Some of the reasons for the dropout rate are the challenging academic reading programmes at first year level. As explained in chapter 1, some of these students did not get proper preparation from high schools, hence there is a high dropout rate at tertiary institutions (van Zyl, 2015). The designed intervention strategy might therefore help in addressing the challenges in academic reading at first-year level, and might also be utilized by teachers at high school in preparing students for university studies.

6.8 IMPLICATIONS

According to the NBT (2014) discussed in chapter 3, students who become successful at universities are those who perform at the proficient level, which is from 64% to 100%. The results from this study indicate that no students performed at this level, and this is a great concern. The results imply that all the students who registered in the foundation have academic reading challenges and therefore need structured assistance in developing their academic reading abilities. The implications of the above results are that students are rightly placed in the foundation programme and an intensive academic reading programme should be put in place to develop their academic reading skills.

6.9 RECOMMENDATIONS FOR FUTURE STUDIES

The researcher would like to recommend that in future, follow up studies be conducted in the form of action research. This might help to give more chances for applicability in different areas of the reading programme. Students' academic reading profiles should be studied in more detail for designing more intervention strategies to address the problem of under-preparedness. One area which needs more attention is the language of science in reading texts. In addressing the academic reading skills of students in the sciences, the role of language should also be explained. This is informed by the students' performance in the grammar and vocabulary domains. Their performance in these domains implies that more attention should be on developing these competencies hence the need for new studies.

6.10 Limitations

The researcher would like to acknowledge some of the limitations observed and experienced in carrying out this study. The researcher wanted the study to be more of an action research where addressing students' weaknesses would be an on-going process of administering of the intervention tool, evaluation and creation students' profiles. This was not possible due to the researcher change of employment from the University of Venda to University of Limpopo.

6.11 SUMMARY

This chapter reflected on the results presented and gave the conclusion and recommendations for the whole study. The study recommends that attention should be on developing students' sub-domains in academic reading, as these are the important ones in enhancing students' academic reading skills. Based on the above recommendations, the researcher discussed the designed intervention strategy through which the weaknesses as depicted from the NBT findings can be addressed (see appendix E). Recommendations for further studies, limitations and a summary are also given.

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APPENDIXES

APPENDIX A

4 Mokolo Street
Penina Park
Polokwane
0699
22 January 2015

The Dean
School of Mathematical and Natural Sciences
University of Venda
Thohoyandou
0950
Sir/Madam

REQUEST TO COLLECT DATA

I would like to request for your permission to collect data in the **Science Foundation Department**. I am a registered PhD student in the **School of Humanities (student number: 11637312)**. My topic for research is: ***The evaluation of the academic reading skills of the Science Foundation students at the University of Venda***. The aim of the research is to profile the academic reading levels of students registered in the foundation programme, and then come up with an intervention strategy to develop their academic reading skills, as preparing them for mainstream studies. The research will be conducted in January 2015 until June 2015. The data collection instrument to be used is the National Benchmarking Test, which will require students write the test for duration of three hours.

Please find the consent form to be filled by students before collecting the data.

Hoping for positive consideration.

Yours faithfully

Molotja Tsebe Wilfred

0736266621

APPENDIX B

4 Mokolo Street
Penina Park
Polokwane
0699
22 January 2015

The H.O.D
Science Foundation Department
School of Mathematical and Natural Sciences
University of Venda
Thohoyandou
0950
Sir/Madam

REQUEST TO COLLECT DATA

I would like to request for your permission to collect data in the **Science Foundation Department**. I am a registered PhD student in the **School of Humanities (student number: 11637312)**. My topic for research is: ***The evaluation of the academic reading skills of the Science Foundation students at the University of Venda***. The aim of the research is to profile the academic reading levels of students registered in the foundation programme, and then come up with an intervention strategy to develop their academic reading skills, as preparing them for mainstream studies. The research will be conducted in January 2015 until June 2015. The data collection instrument to be used is the National Benchmarking Test, which will require students write the test for duration of three hours.

Please find the consent form to be filled by students before collecting the data.

Hoping for positive consideration.

Yours faithfully

Molotja Tsebe Wilfred

0736266621

APPENDIX C

University of Venda

CONSENT FORM FOR PARTICIPATION IN THE RESEARCH

You are invited to participate in the research study conducted by Molotja Tsebe Wilfred. The purpose of this research is to **evaluate the academic reading abilities of science foundation students at University of Venda.**

Participants are advised that the researcher will do everything possible to protect their privacy. Your identity will not be revealed in any publication resulting from this study. Your participation in this research is voluntary. You may choose not to participate and you may withdraw your consent to participate at any time.

Consent

I have read this consent form and I give my consent to participate in this study.

Participant's signature:_____ Date:_____

APPENDIX D: INTERVENTION ACTIVITIES

UNIT 1 ACADEMIC READING

ACTIVITY 1 Practice

Scan the text below and answer the following question:

Why was it difficult to keep koalas alive in zoos?

Note: See how fast you can find the answer!

Section from "Deadly Leaves"

Koalas, native to the Australian wilds, initially proved difficult to keep alive in zoos. Because koalas eat nothing but the leaves of the eucalyptus tree, zoos provided them with an unlimited supply of eucalyptus leaves. One zoo even planted eucalyptus trees in a special grove to ensure that the koalas had a continual supply of fresh leaves. However, koalas kept in captivity always died within a year or their arrival at the zoo.

Source: *Deadly Leaves, CAHSEE released passage*

B. Skimming

Skimming is used to quickly **identify the most important ideas** of a text. Skimming involves moving your eyes quickly down the page and focusing on any **titles**, **headings**, **sub-headings**, and text in **bold**.

To determine what is most important:

1. Glance over the **main features** of the piece:

- The title
- The headings
- The lead paragraph
- The summary paragraphs

2. Look for any **hints** given by the author:

- <u>Underlining</u>
- **Bolding**
- *Italics*
- Subheadings

• Section break

Activity 2 Skimming Exercise

2. Does the document address missed or late assignments?

_____

3. Does the document explain the consequences of physically aggressive behaviour towards their fellow students? If so, explain.

_____

4. Does the document explain the consequences of inappropriate dress?

_____

5. Does the document provide information on vacation days?

_____

6. Does the document provide information on the length of the school day?

_____

7. Does the document provide examples of physically aggressive behaviour?

ACTIVITY 3. **Question Type II: In Other Words…**

These questions are often based on an **idea**, rather than a specific and isolated detail. You need to look for the part in the text that talks about that **idea** and then look for an answer that is stated in **different words** than those used in the text. **In other words**, you must **summarize** the author's ideas.

1. Which statement best illustrates…?
2. First skim and scan the text to find the idea referred to in the question?
3. Which statement best summarizes…?
4. Based on information in the text, which would be….?

Activity 4 Making time for science

Chronobiology might sound a little futuristic – like something from a science fiction novel, perhaps – but it's actually a field of study that concerns one of the oldest processes life on this planet has ever known: short-term rhythms of time and their effect on flora and fauna.

This can take many forms. Marine life, for example, is influenced by tidal patterns. Animals tend to be active or inactive depending on the position of the sun or moon. Numerous creatures, humans included, are largely diurnal – that is, they like to come out during the hours of sunlight. Nocturnal animals, such as bats and possums, prefer to forage by night. A third group are known as crepuscular: they thrive in the low-light of dawn and dusk and remain inactive at other hours.

When it comes to humans, Chrono biologists are interested in what is known as the circadian rhythm. This is the complete cycle our bodies are naturally geared to undergo within the passage of a twenty-four hour day. Aside from sleeping at night and waking during the day, each cycle involves many other factors such as changes in blood pressure and body temperature. Not everyone has an identical circadian rhythm. 'Night people', for example, often describe how they find it very hard to operate during the morning, but become alert and focused by evening. This is a benign variation within circadian rhythms known as a chronotype.

Scientists have limited abilities to create durable modifications of Chrono biological demands. Recent therapeutic developments for humans such as artificial light machines and melatonin administration can reset our circadian rhythms, for example, but our bodies can tell the difference and health suffers when we breach these natural rhythms for extended periods of time. Plants appear no more malleable in this respect; studies demonstrate that vegetables grown in season and ripened on the tree are far higher in essential nutrients than those grown in greenhouses and ripened by laser.

Knowledge of Chrono biological patterns can have many pragmatic implications for our day-to-day lives. While contemporary living can sometimes appear to subjugate biology – after all, who needs circadian rhythms when we have caffeine pills, energy drinks, and shift work and cities that never sleep? – keeping in synch with our body clock is important.

The average urban resident, for example, rouses at the eye-blearing time of 6.04 a.m., which researchers believe to be far too early. One study found that even rising at 7.00 a.m. has deleterious effects on health unless exercise is performed for 30 minutes afterward. The optimum moment has been whittled down to 7.22 a.m.; muscle aches, headaches and moodiness were reported to be lowest by participants in the study who awoke then.

Once you're up and ready to go, what then? If you're trying to shed some extra pounds, dieticians are adamant: never skip breakfast. This disorients your circadian rhythm and

puts your body in starvation mode. The recommended course of action is to follow an intense workout with a carbohydrate-rich breakfast; the other way round and weight loss results are not as pronounced.

Morning is also great for breaking out the vitamins. Supplement absorption by the body is not temporal-dependent, but naturopath Pam Stone notes that the extra boost at breakfast helps us get energised for the day ahead. For improved absorption, Stone suggests pairing supplements with a food in which they are soluble and steering clear of caffeinated beverages. Finally, Stone warns to take care with storage; high potency is best for absorption, and warmth and humidity are known to deplete the potency of a supplement.

After-dinner espressos are becoming more of a tradition – we have the Italians to thank for that – but to prepare for a good night's sleep we are better off putting the brakes on caffeine consumption as early as 3 p.m. With a seven hour half-life, a cup of coffee containing 90 mg of caffeine taken at this hour could still leave 45 mg of caffeine in your nervous system at ten o'clock that evening. It is essential that, by the time you are ready to sleep, your body is rid of all traces.

Evenings are important for winding down before sleep; however, dietician Geraldine Georgeou warns that an after-five carbohydrate-fast is more cultural myth than Chrono biological demand. This will deprive your body of vital energy needs. Overloading your gut could lead to indigestion, though. Our digestive tracts do not shut down for the night entirely, but their work slows to a crawl as our bodies prepare for sleep. Consuming a modest snack should be entirely sufficient.

Questions 1–7

Do the following statements agree with the information given in Reading passage 1?

Answer True, False or Not given to questions 1–7.

True	if the statement agrees with the information
False	if the statement contradicts the information
Not given	if there is no information on this
Questions	
1) Chronobiology is the study of how living things have evolved over time.	
2) The rise and fall of sea levels affects how sea creatures behave.	
3) Most animals are active during the daytime.	
4) Circadian rhythms identify how we do different things on different days.	
5) A 'night person' can still have a healthy circadian rhythm.	
6) New therapies can permanently change circadian rhythms without causing harm.	
7) Naturally-produced vegetables have more nutritional value.	

Questions 8–13

Choose the correct letter, A, B, C or D.

Questions
8) What did researchers identify as the ideal time to wake up in the morning? A) 6.04 B) 7.00 C) 7.22 D) 7.30
9) In order to lose weight, we should A) avoid eating breakfast B) eat a low carbohydrate breakfast C) exercise before breakfast D) exercise after breakfast
10) Which is NOT mentioned as a way to improve supplement absorption? A) avoiding drinks containing caffeine while taking supplements B) taking supplements at breakfast C) taking supplements with foods that can dissolve them D) storing supplements in a cool, dry environment
11) The best time to stop drinking coffee is A) mid-afternoon B) 10 p.m. C) only when feeling anxious D) after dinner
12) In the evening, we should

A) stay away from carbohydrates

B) stop exercising

C) eat as much as possible

D) eat a light meal

13) Which of the following phrases best describes the main aim of Reading Passage 1?

A) to suggest healthier ways of eating, sleeping and exercising

B) to describe how modern life has made chronobiology largely irrelevant

C) to introduce chronobiology and describe some practical applications

D) to plan a daily schedule that can alter our natural chronobiological rhythms

ACTIVITY 5

Scanning and searching

Scan and search these three entries taken from the Cambridge Encyclopaedia in order to answer the questions that follow.

Remember, you don't have to read the whole entry.

Acupuncture *acupuncture (Lat acus 'needle' + punctura 'piercing'*) a medical practice known in China for over 3000 years, which has come to attract attention in the West. It consists of the insertion into the skin and underlying tissues of fine needles, usually made of steel, and of varying lengths according to the depth of the target point. The site of insertion of each needle is selected according to the points and meridians related to the tissue or organ believed to be disordered, and several hundred specific points have been identified. Areas which are painful on pressure may also be selected ('trigger point' acupuncture).

Studies are now in progress to establish which disorders benefit from acupuncture, but neuralgia, migraine, sprains, and asthma are claimed to respond, while infectious diseases and tumours are unlikely to do so. It is also employed as an analgesic during surgery in the Far East, where skills in local or general anaesthesia are often not easily available. Today, acupuncture is used widely among the general population in China; equipment can be purchased in shops, and used in the way simple pain killers are employed in the West. The efficacy of the method is now being subjected to statistically-controlled trials, but accounts of successes remain anecdotal. Its mechanism of action is also unknown. In the terms of Chinese philosophy it is believed to restore the balance of the contrasting principles of *yin* and *yang*, and the flow of Qi in hypothetical channels of the body (*meridians*). Research has shown that brain tissue contains morphine-like

substances called *endorphins*, which may be released in increased amounts when deep sensory nerves are stimulated by injury near the body surfaces. A possible mode of action therefore is that these substances are released by acupuncture, and some degree of tranquillity and analgesia is induced: alternative medicine; auricular therapy; moxibustion; tradition Chinese medicine; yin and yang

a) (*scanning*) What are endorphins?

b) (*searching*) Where was acupuncture first used? How long has it been used there?

ACTIVITY 6

Read the passage. Then answer the questions below. After you have answered the first 9 questions you will answer a 'Summary Question'.

Smart Energy

The next few decades will see great changes in the way energy is supplied and used. In some major oil producing nations, 'peak oil' has already been reached, and there are increasing fears of global warming. Consequently, many countries are focusing on the switch to a low carbon economy. This transition will lead to major changes in the supply and use of electricity. **[A]** Firstly, there will be an increase in overall demand, as consumers switch from oil and gas to electricity to power their homes and vehicles. **[B]** Secondly, there will be an increase in power generation, not only in terms of how much is generated, but also how it is generated, as there is growing electricity generation from renewable sources. **[C]** To meet these challenges, countries are investing in Smart Grid technology. **[D]** This system aims to provide the electricity industry with a better understanding of power generation and demand, and to use this information to create a more efficient power network.

Smart Grid technology basically involves the application of a computer system to the electricity network. The computer system can be used to collect information about supply and demand and improve engineer's ability to manage the system. With better information about electricity demand, the network will be able to increase the amount of electricity delivered per unit generated, leading to potential reductions in fuel needs and carbon emissions. Moreover, the computer system will assist in reducing operational and maintenance costs.

Smart Grid technology offers benefits to the consumer too. They will be able to collect real-time information on their energy use for each appliance. Varying tariffs throughout the day will give customers the incentive to use appliances at times when supply greatly exceeds demand, leading to great reductions in bills. For example, they may use their washing machines at night. Smart meters can also be connected to the internet or telephone system, allowing customers to switch appliances on or off remotely. Furthermore, if houses are fitted with the apparatus to generate their own power, appliances can be set to run directly from the on-site power source, and any excess can be sold to the grid.

With these changes comes a range of challenges. The first involves managing the supply and demand. Sources of renewable energy, such as wind, wave and solar, are

notoriously unpredictable, and nuclear power, which is also set to increase as nations switch to alternative energy sources, is inflexible. With oil and gas, it is relatively simple to increase the supply of energy to match the increasing demand during peak times of the day or year. With alternative sources, this is far more difficult, and may lead to blackouts or system collapse. Potential solutions include investigating new and efficient ways to store energy and encouraging consumers to use electricity at off-peak times.

A second problem is the fact that many renewable power generation sources are located in remote areas, such as windy uplands and coastal regions, where there is currently a lack of electrical infrastructure. New infrastructures therefore must be built. Thankfully, with improved smart technology, this can be done more efficiently by reducing the reinforcement or construction costs.

Although Smart Technology is still in its infancy, pilot schemes to promote and test it are already underway. Consumers are currently testing the new smart meters which can be used in their homes to manage electricity use. There are also a number of demonstrations being planned to show how the smart technology could practically work, and trials are in place to test the new electrical infrastructure. It is likely that technology will be added in 'layers', starting with 'quick win' methods which will provide initial carbon savings, to be followed by more advanced systems at a later date. Cities are prime candidates for investment into smart energy, due to the high population density and high energy use. It is here where Smart Technology is likely to be promoted first, utilizing a range of sustainable power sources, transport solutions and an infrastructure for charging electrically powered vehicles. The infrastructure is already changing fast. By the year 2050, changes in the energy supply will have transformed our homes, our roads and our behaviour.

1. According to paragraph 1, what has happened in some oil producing countries?

A They are unwilling to sell their oil any more.

B They are not producing as much oil as they used to.

C The supply of oil is unpredictable.

D Global warming is more sever here than in other countries **(2)**

2. Which of the following is NOT a benefit of Smart Grid technology to consumers?

A It can reduce their electricity bills.

B It can tell them how much energy each appliance is using.

C It can allow them to turn appliances on and off when they are not at home.

D It can reduce the amount of energy needed to power appliances **(2)**

3. According to paragraph 4, what is the problem with using renewable sources of power?

A They do not provide much energy.

B They often cause system failure and blackouts.

C They do not supply a continuous flow of energy.

D They can't be used at off-peak times **(2)**

4. Quote a phrase from paragraph **ONE** which tells us about the change in the climatic conditions which affected the production of oil. **(2)**

5. State the results of the switch to the use of low carbon energy as suggested in the passage. **(4)**

6. Explain how will consumers benefit from the use of Smart Grid Technology? (8)

7. Find synonyms for the following words from the passage:

(a) as a result

(b) decreasing

(c) instrument

(e) shows **(10)**

Active reading

To ensure you're actively engaged with the text – not just passive reading

Always make notes:

▸▸*Underlining and highlighting (in photocopies)*: do this to the most important parts; use different colours for different aspects

▸▸*Note key words*: try to make this thematic (linked to the topics that you are writing about). And remember: if it's not your book, make the notes in another document. For example, keep a file on your computer or keep a notebook for comments on the things you've been reading

▸▸*Questions*: note down questions that arise as you are reading; do they get answered in the article?

▸▸*Summaries – summarise in your own words*: the whole article if you're skimming or paragraphs if you're doing a detailed reading. Skim through again and check you've reflected the content accurately.

Reading tips

Look for particular signals in the text:
- ‘three advantages of…’ or ‘a number of methods are available’… (lists will follow)
- ‘One important cause of… another important factor… the final cause of…’ (indicates a sequence – you can scan for the three causes)
- Points illustrated by examples – a topic sentence of a paragraph followed by an example

Read with a good dictionary, or an on-line dictionary resource
- Look a the full definition – some dictionaries just give synonyms (e.g. impetuous = rash) but a good dictionary will give you explanations and examples of use
- If you can’t find a good explanation for a term, ask your lecturer!

Check the date of publication – is the information up-to-date?

Read the title (obvious, but important!)

Always read the abstract/synopsis first before the whole article

The introduction and conclusion should be enough to tell you if the article is worth reading

Check the contents page in a book for relevant chapters

Look up references for your topic in the index

Read the boldface headings in articles/chapters to see the structure

Look at any maps, graphs or charts

Make notes which identify key themes. Keep a spreadsheet with the author, title, and keywords (Refworks or excel spreadsheet); this will form the basis for your literature review.

UNIT TWO Academic Discourse

At the end of this unit you should be able to:

- know the difference academic discourse and general discourse.
- be able to read through different academic texts.

Academic discourse is putting words and sentences (the other two dimensions) together to clearly communicate complex ideas. Academic discourse, which makes up the bulk of what we call complex language, is at the center of this Network's work. This is the message "level" of communication in which you take a more comprehensive view of the message and how it is constructed. You figure out how to be as clear as possible to a particular audience. Here are some essential components of academic discourse:

- **Message organization and text structure**
- **Voice and register**
- **Density of words, sentences, and ideas**
- **Clarity and coherence**
- **Purpose, functions, audience**

Authors use a variety of linguistic strategies and text structures to create different types of texts such as narratives, sequences, research reports, persuasive letters, web pages, etc. The more quickly a student recognizes the language and structure of a text to create mental framework, the faster and better the student can read the text and hang its information on the meaning "frame." The more proficiently a student understands the audience and purpose, the better he or she can adjust the voice, register, and message structure to maximize clarity and coherence. (*Adapted from WIDA, 2012*)

When reading through academic texts, pay attention to the following:

- Cross-disciplinary terms
- Figurative expressions & multiple meanings

Content vocabulary

- Clarity & coherence
- Register for participants & purposes
- Density of ideas and their relationships
- Message organization & structure (visuals, paragraphs)
- Create a logical flow of and connections between ideas, knowing how ideas develop and need to develop
- Match language with the purpose of the message (Clear, complete, focused, logical, appropriate to the discipline)
- Create, clarify, fortify, & negotiate

Choose and use the best words and phrases communicate

Figure out the meaning of new words and terms

- Use and clarify new words to build ideas or create products

Organization of sentences

Affixes, roots, and transformations

ACTIVITY 2.1

Read the passage and answer the questions. For each question, choose the answer which you think fits best according to the text.

Most city parks are places where you can escape from big, ugly structures of metal and stone. The Manhattan High Line is different. Raised 25 feet above the ground, this massive metal structure once supported a rail line. The line opened in 1934 to bring trains directly into factories and warehouses. It was hardly used after the 1960s, and much of it was torn down. However, one stretch remained in a region of Manhattan called Chelsea. Chelsea was becoming more and more upmarket as restaurants, art galleries and apartments were built, but the ugly railway structure remained as a **dead weight**. Everyone knew that at some time, it would have to be removed. But the High Line was not destroyed. In fact, now the old rail line serves as one of the most peaceful places in the city. It holds an elevated park, with carefully tended gardens, a promenade and great views of the city. The idea to convert the rail line into a park came from Joshua David and Robert Hammond. In 1999, they attended a community meeting to decide the fate of the High Line. David and Hammond were the only people at the meeting interested in saving the historical structure. Later on, when they asked railway officials to take them up to look at the High Line, they saw a mile and a half of wild flowers growing in the middle of the city, and they realised that the High Line had potential to become a park. There was growing interest in improving urban centers, and so the project quickly gathered momentum and funds for construction were easily obtained.

The first section of the High Line opened in 2009 and immediately became popular with tourists and locals alike. Each part of the park has a different atmosphere. Some areas are like balconies with wonderful city views. Where the rail line goes between buildings, trees are densely planted. Other sections have wide lawns and walkways planted with wild flowers. Only the final section remains the way it has been for the last fifty years – a railway line overgrown with weeds.

ACTIVITY 2.2

The Triune[1] Brain

The first of our three brains to evolve is what scientists call the reptilian cortex. This brain sustains the elementary activities of animal survival such as respiration, adequate rest and a beating heart. We are not required to consciously "think" about these activities. The reptilian cortex also houses the "startle centre", a mechanism that facilitates swift reactions to unexpected occurrences in our surroundings. That panicked lurch you experience when a door slams shut somewhere in the house, or the heightened awareness you feel when a twig cracks in a nearby bush while out on an evening stroll are both examples of the reptilian cortex at work. When it comes to our interaction with others, the reptilian brain offers up only the most basic impulses: aggression, mating, and territorial defence. There is no great difference, in this sense, between a crocodile defending its spot along the river and a turf war between two urban gangs.

Although the lizard may stake a claim to its habitat, it exerts total indifference toward the well-being of its young. Listen to the anguished squeal of a dolphin separated from its

pod or witness the sight of elephants mourning their dead, however, and it is clear that a new development is at play. Scientists have identified this as the limbic cortex. Unique to mammals, the limbic cortex impels creatures to nurture their offspring by delivering feelings of tenderness and warmth to the parent when children are nearby. These same sensations also cause mammals to develop various types of social relations and kinship networks. When we are with others of “our kind” – be it at soccer practice, church, school or a nightclub – we experience positive sensations of togetherness, solidarity and comfort. If we spend too long away from these networks, then loneliness sets in and encourages us to seek companionship.

Only human capabilities extend far beyond the scope of these two cortexes. Humans eat, sleep and play, but we also speak, plot, rationalise and debate finer points of morality. Our unique abilities are the result of an expansive third brain – the neocortex – which engages with logic, reason and ideas. The power of the neocortex comes from its ability to think beyond the present, concrete moment. While other mammals are mainly restricted to impulsive actions (although some, such as apes, can learn and remember simple lessons), humans can think about the “big picture”. We can string together simple lessons (for example, an apple drops downwards from a tree; hurting others causes unhappiness) to develop complex theories of physical or social phenomena (such as the laws of gravity and a concern for human rights).

The neocortex is also responsible for the process by which we decide on and commit to particular courses of action. Strung together over time, these choices can accumulate into feats of progress unknown to other animals. Anticipating a better grade on the

following morning's exam, a student can ignore the limbic urge to socialise and go to sleep early instead. Over three years, this ongoing sacrifice translates into a first class degree and a scholarship to graduate school; over a lifetime, it can mean ground-breaking contributions to human knowledge and development. The ability to sacrifice our drive for immediate satisfaction in order to benefit later is a product of the neocortex.

Understanding the triune brain can help us appreciate the different natures of brain damage and psychological disorders. The most devastating form of brain damage, for example, is a condition in which someone is understood to be brain dead. In this state a person appears merely unconscious – sleeping, perhaps – but this is illusory. Here, the reptilian brain is functioning on autopilot despite the permanent loss of other cortexes.

Disturbances to the limbic cortex are registered in a different manner. Pups with limbic damage can move around and feed themselves well enough but do not register the presence of their littermates. Scientists have observed how, after a limbic lobotomy[2], "one impaired monkey stepped on his outraged peers as if treading on a log or a rock". In our own species, limbic damage is closely related to sociopathic behaviour. Sociopaths in possession of fully-functioning neocortex are often shrewd and emotionally intelligent people but lack any ability to relate to, empathise with or express concern for others.

One of the neurological wonders of history occurred when a railway worker named Phineas Gage survived an incident during which a metal rod skewered his skull, taking a considerable amount of his neocortex with it. Though Gage continued to live and work

as before, his fellow employees observed a shift in the equilibrium of his personality. Gage's animal propensities were now sharply pronounced while his intellectual abilities suffered; garrulous or obscene jokes replaced his once quick wit. New findings suggest, however, that Gage managed to soften these abrupt changes over time and rediscover an appropriate social manner. This would indicate that reparative therapy has the potential to help patients with advanced brain trauma to gain an improved quality of life.

1 Triune = three-in-one

2 Lobotomy = surgical cutting of brain nerves

Questions 1–22

Classify the following as typical of

A	the reptilian cortex
B	the limbic cortex
C	the neocortex

Answer A, B or C, to questions 1–09.

Questions
1) giving up short-term happiness for future gains
2) maintaining the bodily functions necessary for life
3) experiencing the pain of losing another
4) forming communities and social groups
5) making a decision and carrying it out
6) guarding areas of land
7) developing explanations for things
8) looking after one's young
9) responding quickly to sudden movement and noise

Questions 10–13

Complete the sentences below.

Use no more than two words from the passage for each answer.

Questions
10) A person with only a functioning reptilian cortex is known as.....
11) ..... in humans is associated with limbic disruption.
12) An industrial accident caused Phineas Gage to lose part of his.....
13) After his accident, co-workers noticed an imbalance between Gage's ..... and higher-order thinking.

ACTIVITY 2.3 Original Text

HOW TO BUY A HEALTHY KITTEN

Examine the kitten closely before buying. The eyes should be clear, not watering excessively, and white skin at corners should not show. Nostrils should be clear, not exuding mucus, a sure sign of incubating health problems. The ears should be clean without excessive dirt or wax-like substance which indicates the presence of mites. Examine the fur by spreading the fur and looking at the skin for sores and scabs indicating fungus condition. Check fur for fleas or flea eggs which look like small black dots. Check kitten's litter pan for signs of diarrhea.

(Extract from Cat Catalog. *New York: Crown Publishers, 1982)*

Exercise 1

Make any changes to vocabulary and sentence structure that would be necessary to make this text comprehensible to a child of around ten years of age. [-19-]

Exercise 2

Rewrite the text so that it is not only comprehensible to a child of ten, but so that it will also be effective in getting its message across to a child who is about to buy a kitten,

probably for the first time. Your text is to be printed as a one-page information leaflet that can be picked up in libraries, vets' surgeries, etc.

(Adapted from an exercise by Althea Ryan and Hans Arndt)

In this exercise students should begin by studying examples of the target genre, namely newspaper and magazine articles about holiday [-20-] travel. They will quickly discover characteristics of this type of writing such as use of first person, use of narrative sections about the writer's own visit to the place in question, descriptive passages with extensive use of positively or negatively evaluative adjectives and adverbs, and in many cases use of figurative language.

They will then be ready to tackle the task itself. Though the original article was written for a completely different purpose, there is in fact adequate information contained or implied in it to produce a short travel article. One effect of this exercise is to demonstrate how the same information can easily be presented in very different lights.

The newspaper article below describes in very negative terms the building of a luxury hotel on a Pacific island. You are to imagine that the hotel has now been completed. You are a professional travel writer, and you have just spent a few days staying at the Rarotonga Sheraton. You had a wonderful time in this first-class hotel on a beautiful island. You are now to write a travel feature article about your stay for a British or American newspaper (choose which newspaper you want to write for). Your article must be broadly positive, though you may include some minor points of criticism if you wish.You should base your article on information stated or implied in the source text. You may invent some *minor* additional details, such as information about cost and about how you got to the Cook Islands, if you feel that these details are essential to your article.

UNIT 3 ACADEMIC WRITING

At the end of this unit, students

- **should be able to write lab reports**
- **should be familiar with the structure of an academic essay.**
- **should be able to write a coherent, cohesive academic essay following the structure as discussed above.**

3.1 The lab report

The laboratory report is an important form of writing for scientists as it provides a record of experiments completed. Depending on the type of task or investigation you carry out, the sections of the written piece may vary, but a lab report or project report will usually have a title page, abstract, introduction and methods, results, discussion sections, a conclusion and references test section.

A report may be one page long or 100 pages long. In some disciplines, such as science, information technology, or business, reports form the basis of academic and professional writing.

A report is designed so that information can be accessed easily – that is why a typical report has clearly delineated sections, headings, tables of contents and visuals.

Different people may read a report for different reasons – and students need to practise writing for the multiple possible audiences of a report.

A good report

- A good report is concise – the language is clear and the paragraphs are well structured.
- A good report has clear headings and subheadings.
- A good report is thorough, with sufficient data, evidence and clear conclusions.
- A good report has relevant information.
- A good report is visually appealing – font, spacing, editing, visuals, headings and referencing are all appropriate.

The structure of a report

This is a *brief* guideline to what may be included in a report. A report is not an information brochure – students need to address a problem, research the problem and provide plausible solutions to the problem and recommendations.

Below is a list of sections that may need to be included in a report.

1. Title page (separate page)

The title page should include unit name and number, assignment name and number, student name and number and tutor's name.

2. Abstract (separate page)

The abstract is a summary of the report, not an introduction. It is usually written last, and is about 100 to 200 words long.

3. Glossary (separate page)

The glossary contains any words or terms used that the audience may not know, along with their definitions.

4. Table of contents (separate page)

The table of contents page contains lists of section headings, tables and figures (if any). These tables of contents can be automatically created using the styles in Microsoft Word.

Make sure that headings are numbered.

Make sure that there are no single word headings.

Headings should not be questions.

5. Introduction (separate page)

The introduction is the start of the main text of the report. Students should start this section on a separate page, with the title of their assessment at the top followed by the heading 'Introduction'.

The introduction should state the topic and the reason for the report, and answer these two questions:

a. Problem, hypothesis, or question – what does the student/author want to research?

b. Importance of research – why is this an important area to study?
The introduction of a report is broken down into three paragraphs.

A. Overview or orientation to the topic

This section contains a general statement that introduces the topic and particular focus to the audience. Definitions of the topic or focus area should be included and students may clarify their position or view of this area. References may be needed.

B. Background

The background to topic and main issues or problems that need to be addressed should be explained. Students need to provide an outline of the main problem, its causes and the importance of this area. Students may provide historical information, recent developments and core issues. References may be needed.

C. Purpose

The purpose of the report and an outline of the key areas that will be covered need to be included here. The audience will use this as a guide to the report.

6. Literature review (follow on from 'Introduction')

The literature review is where the students include current and/or relevant research. Here they include current information, past trends and relevant data regarding their topic. The aim of the review is the synthesis of information and not a list or summary of texts.

7. Methodology (follow on)

In this section students write how they did their research: did they look over materials, did they do an experiment, did they conduct an interview, and did they compare data sources? – in summary, how they collected and analysed their data?

8. Results (follow on)

This is where students write about the information that they found. This section is factual and may be brief.

Did the student researcher have problems gathering data? Was the methodology inappropriate? Are the results clear?

9. Discussion (follow on)

This is where students can employ writing on cause and effect, or comparative or persuasive writing as they discuss their results. Was one model better than another? Was the data inconclusive? Will there be problems in the future? What are the limitations of the technology, how can it be improved, is it too expensive, will it be feasible, and so on.

10. Conclusion (follow on)

This is where students summarise the report. This may be very brief.

The final section of their report is the conclusion. This may be separated into two sections – conclusion and recommendations. The conclusion contains no new information, no references, no quotes and no statistics. It is a summary of the main points of their report accompanied by recommendations for future study or a course of action.

Structure of the conclusion

The conclusion has three stages.

1. Review of general statement

Students should re-write the first sentence of their report with the addition of a transition such as in summary; in brief; in conclusion.

2. Summary of key findings

Students need to summarise their main points or findings in the order they appeared within the report. They need to let the audience know the main points or issues that they found.

3. Recommendations

In a couple of sentences students need to make a recommendation for future action, such as more research, a possible course of action, changes that need to be made and the limitations of their research.

Section	Description
Title page + ID details	• displays your name and student ID number • the title gives a precise description of what is in the report (this may be supplied by the lecturer).
Abstract	• placed at the beginning of the report • provides a summary of the entire paper (about 5% of the whole text) including: the problem and its importance what was done (the experiment) how it was done (the method) what resulted (the most important results) what this research contributes to the field (significance) NB: The abstract does not include figures or tables.
Introduction	• gives the background or scope of study • includes background information so that the reader 1. understands the question behind the research 2. how it relates to other work in the field, and 3. why it is worth investigating.
Methods	• describes the methods and procedures used • clearly explains the methodology so that it could be replicated (repeated) by another researcher.

Results	• presents the results of the experiment • uses an equation editor with correct mathematical symbols if the results involve numbers and equations • includes clearly labelled figures, tables and graphs where appropriate.
Discussion	• analyses and interprets the results, showing how these relate to the scope of study • states conclusions about how the results confirm, verify, or support the hypothesis, or refute, negate, or contradict it. NB: The word "prove" is not used except in very specific contexts (e.g. in mathematics).
Conclusion	• summarises the conclusions of the study.
References	• lists all references cited in the text.

For an outline of the organisation of a typical laboratory report and samples of each section of the report, check the site on laboratory report.

3.2 Paragraph Writing

Paragraphs are the essential building blocks of your writing. They mark the flow of your argument, with each paragraph focusing on one main idea and a cluster of connected sentences to expound upon and amplify it. Your argument progresses by moving from the main idea in one paragraph to the main idea in the next. Paragraphs also provide the reader with *visual* help in following your argument as they appear as separate blocks of text on the printed page.

Length of a paragraph

• There is no ideal length that can apply to all paragraphs since length depends largely on the content. However, as a general guide, it is helpful to the reader to keep most of your paragraphs to between seven and fourteen lines in length (say, between three and six or seven sentences).

- Occasionally paragraphs can be shorter than this (where a point needs to be made briefly or with special emphasis) or longer (where more detailed elaboration of a point is needed).
- For the reader, too many short paragraphs make your writing too bitty, while too many long ones makes it rather heavy and difficult to follow.

Number of ideas in a paragraph

There is normally only one main idea in each paragraph and this is expressed in a **topic sentence**. The other sentences support and expand on the idea in the topic sentence in different ways. The last sentence can often be important too, as it can be used to summarise the gist of the paragraph.

Placing the main idea in the paragraph

The 'topic sentence' is usually the first sentence in the paragraph, though it can be the second (when the first is used as a kind of introduction). You can test this by 'skimming' an article quickly, just reading the first sentences of each paragraph, and seeing if you can follow the overall development of the argument. Normally, you can.

Structure of a paragraph

There is no single pattern that will apply to all paragraphs. Following the topic sentence, the other sentences can have a variety of functions, e.g.:

- clarifying or re-stating the main idea
- explaining the idea
- qualifying the main point in some way
- providing examples
- giving supporting evidence
- commenting on the main idea.

There is also some linking, either stated or implied, with the previous and the following paragraphs.

Sample paragraph

The following paragraph can be analysed to show its structure and the functions of the 8 sentences. (The numbers are inserted only to identify the sentences)

(1) The Ultra Long Duration Balloon is a super-pressure, or "closed" balloon, which is not vented to the atmosphere like conventional balloons. (2) Usually fabricated from stronger materials such as polyester, super-pressure balloons are inflated like their zero-pressure counterparts and then sealed. (3) Once a super-pressure balloon reaches the desired altitude, the sun's heat forces the internal pressure to rise until it exceeds the outside ambient pressure. (4) As a result, the differential pressure between the inside and the outside increases. (5) At night when the gas cools, the differential pressure drops, but if enough gas has been put into the balloon the differential cannot drop below zero. (6) In this way, the balloon remains full and at a stable altitude without having to drop ballast. (7) So long as the balloon remains impervious to helium or hydrogen molecules, it can stay aloft. (8) Accordingly, super-pressure balloons can be used for flights of far greater duration than zero-pressure systems.

I. *Steve Smith, Jnr. & James A. Cutts "Floating in Space" Scientific American Vol 281 No 5 November 1999*

Analysis

(1) Is the topic sentence – contrasting the Ultra Long Duration Balloon with conventional ones?

(2) (7) explain how the ULDB works. (2) Describes the special features of its construction. (3) and (4) explain how it operates in the air, with (5) adding what happens at night. (6) and (7) summarise its operation.

(8) Provides an overall conclusion – the ULDB can stay in the air longer than conventional balloons

Points to check in your own writing

Here are some simple tasks for you to see if you are constructing paragraphs properly:

- *Take one or two pages of your academic writing. Do a 'visual' check on the length of paragraphs – does the text look too heavy or too 'bitty' or about right?*
- *Check whether the average length of the paragraphs is between 7 and 14 lines (3 to 7 sentences)*
- *Count the number of words in randomly selected sentences. Does the average number of words come to between 15 and 25? If so, this is about right.*
- *Do the 'skim' test: read through the first sentences only of your whole text and see if you can follow the gist of your argument. If you can, you are writing your topic sentences well.*

UNIT FOUR INFERENCING

At the end of this unit students should be able to:

- **infer meaning from different texts**

Inferences Worksheet 2

Directions: Read each passage and then respond to the questions. Each question will ask you to make a logical inferenc
Explain your answer by referencing the text.

Kyle ran into his house, slamming the door behind him. He threw his book bag on the floor and plopped on the couch.
After six hours of playing *Grand Larceny VII*, he ate some pizza and fell asleep with a slice in on his belly and his feet o
When Kyle came home from school the next day, he was noticeably distraught. He balled up his report card and placed
He then flipped the soup can upside down and relocated garbage from other parts of the can, arranging over the soup can
He then plopped down on the couch and picked up his controller.

1. Why is Kyle distraught? _____

How do you know this?

2. Why does Kyle put the report card in a soup can? _____

How do you know this?

3. Was Kyle's report card good or bad and why was it like that? _____

How do you know this?

Anastasia sat by the fountain in the park with her head in her palms. She was weeping mournfully and wearing all black
In between gasps and sobs, Anastasia cried out a name: "Oh... John…" And then her cell phone beeped. Her hand ran
The text message was from John. She opened up the message and read the few bare words, "*I need to get my jacket back*
Anastasia threw her head into her arms and continued sobbing.

4. What relationship do John and Anastasia have? _____

Why do you feel this way?

5. Why is Anastasia sad? _____

Cassie rolled over in her bed as she felt the sunlight hit her face. The beams were warming the back of her neck when she slowly realized that it was a Thursday, and she felt a little too good for a Thursday. Struggling to open her eyes, she looked up at the clock. “9:48,” she shouted, “Holy cow!” Cassie jumped out of bed, threw on the first outfit that she grabbed, brushed her teeth in two swipes, threw her books into her backpack, and then ran out the door.

6. What problem is Cassie having?

_____

How do you know this?

7. Where is Cassie going?

_____

How do you know this?

Kelvin was waiting in front of the corner store at 3:56. His muscles were tense and he was sweating a bit more than usual. The other kids gathered in front of the little storefront were much more relaxed, even playful. They joked back and forth lightly to each other but for Kelvin, time slowed. 3:57. “Don’t worry, Kelvin. He ain’t even gonna show up.” Kelvin hoped that he wouldn’t. A black four-door Camry with tinted windows pulled up and parked across the street. Kelvin gulped. 3:58. A group of teenagers piled out of the car. James was in the front. “Hi-ya, Kelvin. Glad you could make it,” James said. Kelvin felt smaller.

8. Why is Kelvin waiting at the corner store?

_____

How do you know this?

9. Are James and Kelvin friends?

_____

What in the text supports your idea?

10. Why is Kelvin so nervous?

_____

What in the text supports your idea?

_____

Task 2: Similar content and purpose, different audience and medium

This task is divided into two writing stages, the first in which changes are made only to language, and the second in which more far-reaching changes are made.

In stage 1, changes should be made to vocabulary and syntax. Be prepared for considerable discussion about what exactly the target group (native speaker 10-year-olds) might be able to understand. Stage 2 should produce more radical changes to the text, including changes to layout. After doing this themselves, students will be in a good position to comment on someone else's attempt (in this case, that of the original writers of the exercise); they often find much to criticise. Note, too, that after working with it intensively, students are often critical of the source text; one common feature of this type of work is that students come to realise how badly written many published texts actually are.

Task 3: A more radically altered text

In this exercise students should begin by studying examples of the target genre, namely newspaper and magazine articles about holiday [-20-] travel. They will quickly discover characteristics of this type of writing such as use of first person, use of narrative sections about the writer's own visit to the place in question, descriptive passages with extensive use of positively or negatively evaluative adjectives and adverbs, and in many cases use of figurative language.

They will then be ready to tackle the task itself. Though the original article was written for a completely different purpose, there is in fact adequate information contained or implied in it to produce a short travel article. One effect of this exercise is to demonstrate how the same information can easily be presented in very different lights.

The newspaper article below describes in very negative terms the building of a luxury hotel on a Pacific island.

You are to imagine that the hotel has now been completed. You are a professional travel writer, and you have just spent a few days staying at the Rarotonga Sheraton. You had a wonderful time in this first-class hotel on a beautiful island. You are now to write a travel feature article about your stay for a British or American newspaper (choose which newspaper you want to write for). Your article must be broadly positive, though you may include some minor points of criticism if you wish.

You should base your article on information stated or implied in the source text. You may invent some *minor* additional details, such as information about cost and about how you got to the Cook Islands, if you feel that these details are essential to your article.

UNIT 5 COHESION

At the end of this unit students should be able to:

- **bring the relation between text items.**
- **the relation between subjects and objects in a sentence, paragraph and the whole text.**
- **use the vocabulary, grammatical features to contribute to whole unity of the text.**

Cohesion refers to the vocabulary, grammatical features, cohesive features and information all contribute to the communicative effect of a text. Intensive reading can focus on how the text achieves its communicative purpose through these features and what this communicative purpose is.

The syntax dimension involves putting words and phrases together in sentences. You might notice that academic texts contain a lot more complex and compound sentences. These are often long and contain multiple ideas; as such, readers are challenged to

identify the primary idea of the sentence and how it is supported by the other phrases and clauses. Here are several key aspects of syntax to keep in mind:

- Sentence structure (compound, complex) & length
- Transitions/Connectives (e.g., however, because, therefore, yet, as, despite)
- Complex verb tenses
- Passive voice

Unlike informal language, which uses a variety of linking strategies such as intonation and pace to create a coherent message, academic sentences, especially written texts, tend to be complex in their organization of clauses and phrases. Each clause, which is a chunk of words, represents relationships, experiences, or ideas. Each clause links with previous and subsequent clauses, building up the intended meaning of a sentence. Of course, the clauses, their links, and their presentation all depend on the people involved, the purposes, and thesetting.

Long sentences, which characterize academic language, often have multiple clauses. Long sentences demand that readers/listeners fit more words and thinking into their heads. Students must be trained to quickly and automatically break down long sentences, to process the clauses, and interpret them. They must recognize what is subordinate and, more importantly, what is the main point of the sentence in the main clause. (Refer to chapter 7 for strategies on how to teach students to read long sentences.) Subordination is a hard-to-use tool because it represents hierarchical relationships between clauses. For example, in the sentence, "Although several precautions were taken, the key was lost," the first clause modifies the second, more important clause. Extra clauses, of course, mean extra things to think about in one sentence. Many subordinate clauses begin with words such as although, because, before, if, and despite. We can train students to notice these words and organize their thoughts accordingly.

Authors of academic texts make sentences longer (and make us hold more in our heads) with lists. The most difficult ones are lists of abstract items for which each item has multiple words. For example, "The transformation was complicated by their lack of understanding of the political ramifications of the law, the recent clashes with the ruling party, and the demands of those oppressed by the old regime." Notice the passive voice, long list of abstract subjects, the abstract verb, and abstract object all in the sentence.

Rather than simply reading for the gist, looking for discrete pieces of information, or guessing meanings based on titles and visuals, students must dig into the text to

understand the logical and often implied relationships between clauses. They must learn to pay attention to language forms and features (Scarcella, 2002; Snow, Burns, & Griffin, 1998). Remember that even in science, math, and history, we must teach key "academic grammar" and metalinguistic knowledge in order to help students decipher the complex texts that we ask them to read. Yet we must teach syntax in the context of real reading and writing--not with isolated worksheets and follow-the-rule activities.

BACKGROUND INFORMATION ON READING COMPREHENSION:

Reading Comprehension refers to the ability to comprehend the information presented in written form; this process usually entails understanding a textbook assignment. Reading comprehension skills also may affect ones interpretation of directions on exams, labs, homework assignments and completion of job applications or questionnaires.

PURPOSES OF READING COMPREHENSION STRATEGIES:

Reading is one of the most important academic tasks faced by students. Strategies designed to improve reading comprehensions may have any number of purposes, few are listed below: To enhance understanding of the content information presented in text. To improve understanding of the organization of information in a text. To improve attention and concentration while reading. To make reading a more active process. To increase personal involvement in the reading. To promote critical thinking and evaluation of reading material. To enhance registration and recall of text information in memory.

Malaria— a new threat

Malaria has been the scourge of humanity since the earliest times, and there are ominous signs that it is fighting back against modern science. In this short article, we will be looking at the advances that have been made in the fight against malaria in modern times. We will also be discussing why, in spite of these advances, malaria has

still not been eradicated, and in some ways, poses a greater threat to humanity than ever.

The first great breakthrough in the treatment of malaria was the discovery by Sir Ronald Ross, during the period 1895–98, that the disease was transmitted by the female *Anopheles* mosquito. Then Giovanni Grassi worked out the life cycle of the human malaria parasite. With the connection between malaria and the mosquito clearly established, steps could be taken to fight the disease.
One method was to attack the breeding places of the mosquito. It was known that mosquitoes lay their eggs in water. So, in malaria infested areas work was started on draining marshes and stagnant pools, and trying to ensure generally that there were no areas of water where mosquitoes could breed. Where areas of still water could not be drained, they were sometimes covered with oil or detergent, which made them unusable by the mosquitoes.

One of the most interesting methods of preventing mosquitoes from multiplying is to introduce a different variety of mosquito into an area: when the two varieties mate, the females are infertile. This kind of 'biological engineering' has had some limited success in the field, but it is not always possible to reproduce laboratory conditions in real life. Since there are over 2,600 different kinds of mosquitoes, the research problems are enormous.

The most obvious and easiest method of prevention is to use wire screens and mosquito netting to prevent people being bitten. But this may not always be possible in poor areas, and does not help when people are moving about.

Then people have to cover up and/or use some kind of protective cream or spray. A more flexible method is to take preventive drugs such as quinine. This drug was at one time extremely widely used, but during the Second World War most of the supply areas fell to the Japanese and alternative methods had to be found in the West. These drugs proved to be more effective in many ways, and the use of quinine tailed away. Recently,

however, there have been indications that certain varieties of malaria germs are becoming more resistant to modern drugs, and quinine is coming into use once more.

At one time it seemed that insecticides, especially DDT, might wipe out malaria completely. One of the most successful DDT campaigns was carried out in India. In 1952, at the beginning of the campaign, seventy-five million Indians a year suffered from malaria. By 1965, the spraying of DDT had reduced the number of cases to 100,000. However, as with the malaria germ and preventive drugs, there is evidence that mosquitoes are developing resistance to DDT. One of the reasons for this has been the initial success of the operation.

People became careless. Also, owing to increases in the price of fuel, poorer counties found it impossible to maintain the eradication programme. The situation now is that malaria is staging a comeback, and there are new breeds of mosquito which are resistant to DDT. So we see that there are various methods of fighting malaria. They involve: preventing mosquitoes from breeding; preventing mosquitoes from having the opportunity to bite people; using protective drugs; and using insecticides. Dangerous new developments are that some malaria germs are developing a resistance to modern drugs and the mosquitoes themselves are becoming resistant to insecticides.

ACTIVITY 5.1 Read the following passage and frame 5 questions

Alexander Pope, a great classical poet, loved to live in solitude. His approach to the purpose of life was unique in the sense that he absolutely hated sociability and friendship. Nothing could give him greater pleasure than his feeling of independence in respect of the fulfilment of his basic needs. To him, a truly happy man is he who does not have to depend on others for anything. Such a man gets food from the pieces of land that he inherited, milk from his own herds and fire and shade from his own trees. Such a man enjoys the company of solitude only. He gets plenty of time for work and rest.

Tea was first grown and used in China. It was first used as medicine, and then became a very popular drink. It is now grown largely in India and Sri Lanka. The habit of drinking has now spread all over the world. It is perhaps the most popular of drinks. People find it very refreshing after hard work. And it is practically harmless. That is the reason why it is popular. It is taken in many ways. Usually some leaves are put in boiling water, which is then strained and taken with a little sugar and milk. Some boil the leaves in milk and take the milk with sugar and even with spices. Another way is to take it with sugar and lemon juice.

1 Questions

(a) Where is tea chiefly grown?
(b) Why is it a popular drink?

(c) What are some of the ways of taking tea?

(d) Where is tea drunk today?

2. Say whether the following statements are True or False:

(a) Tea is popular drink only in Europe.

(b) Tea is very harmful to all people.

(c) Tea was first used as a medicine.

(d) Some people take tea with sugar and lemon juice.

ACTIVITY 5.2 EXERCISES ON USING COHESIVE DEVICES

Part A:

Fill in the blanks using AND, SO, BECAUSE, BUT or OR.

1. I could not go out last night _____ I was too busy.

2. I could not go with my friend _____ he went without me.

3. My friend went to the cinema to see a film _____ the film wasn't very good.

4. The cinema was full of people _____ they were all smoking.

5. I like people ____ I don't like smoke.

6. Do you want an orange juice ____ a guava juice?

7. It was my birthday _____ he didn't send me a card.

8. I didn't write to him _____ he didn't write to me.

9. We couldn't contact him _____ we didn't have his number.

10. The new department store is now open _____ it is offering big discounts.

Part B:

Complete the short story below with appropriate cohesive devices.

Mary could not go out with me _____ I invited Anne instead. Anne was very happy to accept my invitation _____ the film was very popular. Anne and I had a good time _____ next day Mary was very angry. "Do you love me _____ do you love Anne?" she asked me. "I like both you _____ Anne," I answered. "Look!" said Mary. "Either you go out with me _____ you go out with Anne. You can't love both me _____ Anne at the same time." "Why not?" I answered. "_____ it's not fair." I asked Mary if she would go out with me tonight _____ she said that she had a new boyfriend _____ didn't want to see me again _____ I didn't really love her. I phoned Anne _____ she said she was busy _____ now I'm alone.

ACTIVITY 5.3 PART C

Combine the following pairs of sentences to be one sentence.

Use appropriate cohesive device(s).

For example:

The little boy walked to the store.

His dog walked along with him.

→ When the little boy walked to the store, his dog walked along with him.

1. Bob is an only child. He is very independent.
2. You have to bring your examination card. You cannot join the exam without the examination card.
3. She went to work. She didn't want to go.
4. My cat was hungry. It had not eaten since breakfast that day.
5. A book can be a lot of fun. A book can be boring.
6. Her wallet fell to the floor. A photo of her boyfriend came out of it.
7. Andy watched her favorite TV show. Andy went to bed.
8. Karen and Sally are best friends. Karen and Sally have many things in common.
9. They made plan to go to the beach. They couldn't do it.
10. I couldn't sleep that night. I was too tired the next morning.

ACTIVITY 5.4 PART D.

Make less number of sentences by combining as many sentences as you can in the following paragraph, using the above examples to guide you.

The Garuda team was three games down. The Garuda team had to win the next four games to move to the next round. Fans of Garuda were worried. Garuda had not won any championship for four years. No team had ever come back in the playoffs from a three-game deficit. All of the Garuda fans knew this. The fans of the Garuda watched anxiously as the fourth game against the Bear began. The fans of the Bear watched confidently. The Bear had a good chance to win the match. The fans of the Bear knew this. Nobody believed the Garuda would win that year. The Garuda won the match that year.

Genetically modified foods

Whether or not to allow genetically modified food is a very controversial issue at the present time. A considerable amount of money has been spent over the last decade on research into altering the genes of cereals, fruit and vegetables in such a way that larger harvests can be obtained.1 ~f this research continues, the whole field of food

production will change radically. Foods that contain genetically _altered ingredients are commonly called GM food, short for genetically modified food. This means that genes from plants or animals are taken and joined (spliced) with other genes from a different plant in order to 'change or alter the original plant. This essay explores some of the issues' surrounding GM food and considers arguments from both the food companies and groups opposed to those companies.

The aim of modifying the genetic structure of food crops is to enable larger harvests from the same area of land. This can be_ achieved by making the plants more resistant to pests and disease, and by increasing their yields. The first point means that fewer plants are 25 damaged, thus increasing the quality of the produce. Also, increases in yields mean that there is more produce from which to select, resulting in higher quality food being available to the consumer. It is a good idea to keep this model of a discussion. Every time you write a discussion essay, either here or at college or at university, use it to make sure you have included all stages.

On one side of the discussion are the food companies who say that using GM crops will mean that the food in supermarkets will be of a, higher quality and cheaper. On the other side of the discussion are various-. Groups who oppose the food companies because these groups are very worried about the dangers of introducing manufactured crops into the environment before there has been adequate time for full-scale testing. They are also worried about the livelihoods of farmers who are becoming more closely controlled by these multinational organisations.
[It is clear from this preview that the essay must now 'consider arguments' from both groups.]
- ...The food companies claim that the increases mentioned above will lead to food prices falling.1 This applies not only to produce that is sold unprocessed, but also to the ingredients in a wide variety of food on sale in the supermarket. If the ingredients can be produced more cheaply, this will result in a fall in the price of the foods that contain them.

UNIT 6 VOCABULARY DEVEOPMENT

At the end of this unit, students should be able to

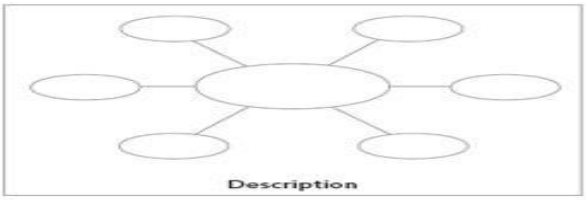
- **use connectors, transition and linking words in different sentences.**

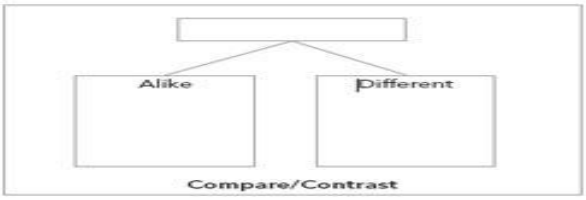
Joining sentences:

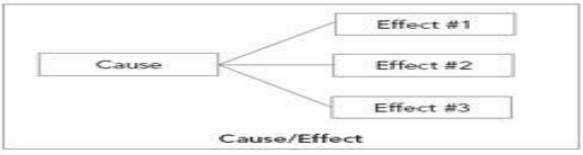
Sentences can be joined using conjunctions which introduce clauses such as time, reason, purpose, condition and contrast. Click on the subtitles below to find the link words specific to your needs.

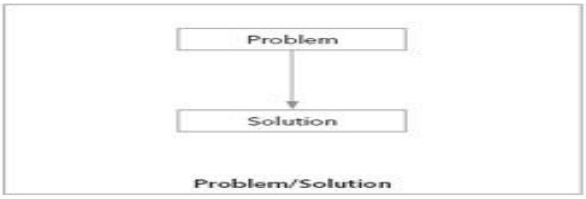
Addition	Cause and Effect	Comparison	Contrast	Time	Example	Summary-Conclusion

Meaning	Basic Form and Formal Use	More Formal	Most Formal
ADDITION	• *also* • *first, second,* etc.	• *additionally* • *besides* • *further* • *furthermore* • *in addition* • *last but not least* • *next* • *not only... but also* • *too*	• *equally important* • *moreover* • *similarly*
CAUSE-EFFECT	• *because* • *since* • *then* • *therefore*	• *as a result* • *for this reason* • *thus*	• *accordingly* • *as a consequence* • *consequently* • *henc*

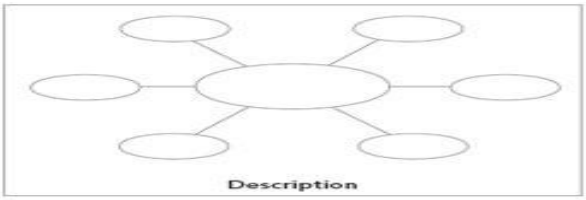


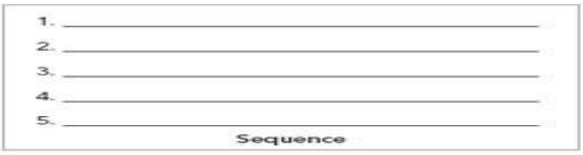


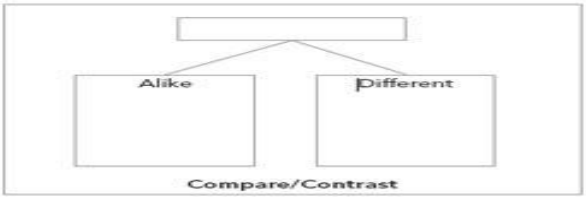


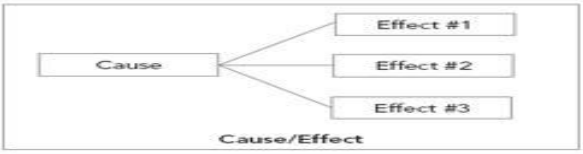


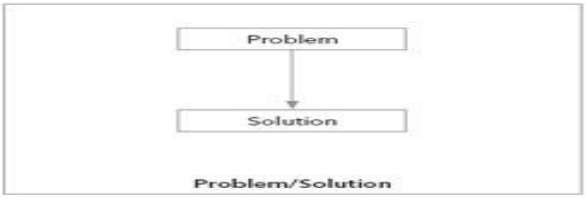
Signal Words/Phrases	
Description	for example, characteristics, for instance, such as, is like, including, to illustrate
Sequence	first, second, third, later, next, before, then, finally, after, when, later, since, now, previously
Compare/ contrast	however, nevertheless, on the other hand, but, similarly, although, also, in contrast, different, alike, same as, either/or, in the same way, just like, just as, likewise, in comparison, whereas, yet
Cause/ effect	if–then, reasons why, as a result, therefore, because, consequently, since, so that, for, hence, due to, thus, this led to
Problem/ solution	problem is, dilemma is, if-then, because, so that, question/answer, puzzle is solved











Signal Words/Phrases	
Description	for example, characteristics, for instance, such as, is like, including, to illustrate
Sequence	first, second, third, later, next, before, then, finally, after, when, later, since, now, previously
Compare/ contrast	however, nevertheless, on the other hand, but, similarly, although, also, in contrast, different, alike, same as, either/or, in the same way, just like, just as, likewise, in comparison, whereas, yet
Cause/ effect	if–then, reasons why, as a result, therefore, because, consequently, since, so that, for, hence, due to, thus, this led to
Problem/ solution	problem is, dilemma is, if-then, because, so that, question/answer, puzzle is solved

COMPARISION	• *also* • *like* • *too* • *as well*	• *as well as* • *both... and* • *compared to* • *in the same way* • *likewise* • *neither... nor*	• *by comparison* • *in common with* • *similarly* • *in like manner*

CONTRAST	• *however* • *but*	• *instead* • *nevertheless* • *on the other hand*	• *conversely* • *in contrast to* • *in opposition to* • *on the contrary* • *otherwise* • *still* • *whereas* • *although* • *even though*

TIME	• *after a while* • *after that* • *also* • *at last* • *currently* • *earlier* • *eventually* • *finally* • *first, second,* etc. • *in the future* • *in the past* • *last* • *next* • *now*	• *afterward* • *at the same time* • *formerly* • *immediately* • *in the meantime* • *later*	• *concurrently* • *previously* • *simultaneously* • *subsequently*

EXAMPLE	*for example*	• *for instance* • *in other words*	• *as an example* • *as an illustration* • *to exemplify*

SUMMARY-CONCLUSION	• *finally* • *therefore*	• *after all* • *all in all* • *at last* • *briefly* • *consequently* • *last* • *on the whole* • *thus*	• *accordingly* • *as a consequence* • *in brief* • *in closing* • *in conclusion* • *in short* • *to sum up* • *in summary* • *to conclude* • *to summarize*

Source:

- *Based on a table written by Patricia Bird and Beverly Benson, Problem/Solution, A Reference for ESL Writers.*

Quantity

1 Think of :

(a) five kinds of food that are good for you

b) five kinds of food that are bad for you

2 Decide whether each of these is (C) countable or (U) uncountable

3 Put a food work in the spaces 1 - 3 below.

(a) If you want to be healthy, you shouldn't eat too much (1)_____.

(b) You should eat plenty of (2) _____.

(c) Too many (3) _____ will make you fat.

4. You should try not to eat _____ salt as many doctors say it's bad for you.

5. If you don't get _____ vitamins, you will get ill easily.

6. Vegetables contain _____ fat.

7. Oranges contain a _____ vitamins.

8. Everyone needs to eat _____ fat, but not too much.

9.Many sweets contain a _____ sugar, which is bad for your teeth

10. If you want to be really healthy, you shouldn't eat _____ fast food.

11. A _____of health problems, such as heart disease and cancer, are caused by eating the wrong kinds of food.

Complete the following sentences using an appropriate conjunction or preposition. Hints

Conjunctions are used to connect two clauses. Prepositions are used to show the relationship between a noun
and another word in the sentence.

1. She went out ……. it was raining.
a) though
b) in spite of
c) Either could be used here

2. The trains were late …… the rain.
a) because
b) because of
c) despite

3. I managed to arrive on time ……. the train late by an hour.
a) despite
b) in spite of

c) although

4. I enjoyed the film ……. having a headache.

a) despite

b) in spite of

c) Either could be used here

5. She bought the car …… the fact that it was expensive.

a) although

b) because

c) in spite of

6. The dress was good …….. expensive.

a) though

b) despite

c) Either could be used here

7. John was absent. ……..., everybody else was present.

a) Although

b) However

c) Either could be used here

8. …….. John was absent, everybody else was present.

a) Though

b) However

c) In spite of

9. We managed to do it …… we didn't receive any assistance from them.

a) despite

b) although

c) Either could be used here

10. We managed to do it …….. the fact that we didn't receive any assistance from them.

a) in spite

b) despite

c) although

Articles exercise

Complete the following sentences using appropriate articles. In some cases, no articles are needed.

1. …….. man is mortal.
2. I am ……. university student.
3. She goes to the temple in …….. mornings.
4. Kiran is ……. best student in the class.
5. …….. camel is the ship of the desert.
6. This book has won …….. Booker prize.
7. Harishchandra was ……. honest king.
8. I am fond of ……. classical music.
9. I met …… boy in …….. store.
10. Gold is …….. precious metal.
11. She returned after …….. hour.
12. There is ……. institution for …….. blind in this city.
13. …….. sun rises in the east.
14. He works at …….. factory.
15. He is ……. oldest member of the club.
16. I like to watch …….. football.

Since and for

Complete the following sentences using since or for.

1. I have been associated with this institution …….. ten years.

since
for

2. He has been ailing …… November.
since
for

3. …….. when have you been attending the course?
Since
For

4. These foreigners have been learning Sanskrit …… six months.
for
since

5. My sister has been learning music ……. last January.
since
for
6. He has worked as a peon ……. ten years.
for
since

7. I have known Kumar ……. two years.
for
since

8. I have known Kumar ……. 1986.
since
for

9. He has been teaching yoga …….. three years.

for

since

10. …….. when have you been learning music ?

Since

For

Some words that are pronounced alike have very different meanings. Examples are: piece and peace. These

word pairs cause a great deal of confusion.

Here is a simple exercise that tests your ability to use these words correctly.

1. Please give me a …… of paper.

a) piece

b) peace

c) peas

2. How much is the railway ……?

a) fare

b) fair

c) far

3. Jane has got very …….. looks.

a) plane

b) plain

c) plan

4. As he had no shirt, the sun burnt his …….. skin.

a) bare

b) bear

c) baer

5. I really want to …….. some weight.

a) lose

b) loose

c) loss

6. An oil lamp needs a ……..

a) weak

b) wick

c) week

7. My little brother is very …… so we don't let him touch anything ……..

a) irresponsable; breakable

b) irresponsible; breakable

c) irresponsible; breakible

8. A …….. looks like a big rabbit.

a) hare

b) heir

c) hair

9. She was unusually …….

a) quiet

b) quite

c) quit

10. ……. going to the market.

a) We're

b) Were

c) Where

Subject verb agreement worksheet

Fill in the blanks with appropriate forms of verb. Choose the answers from the options given in the brackets.

1. One of my friends …….. gone to France. (has / have)
2. Each of the boys ……. given a present. (was / were)
3. Neither of the contestants …….. able to win a decisive victory. (was / were)
4. Oil and water …….. not mix. (do / does)
5. He and I …….. at Oxford together. (was / were)
6. Slow and steady …….. the race. (win / wins)
7. Neither Peter nor James …….. any right to the property. (has / have)
8. No prize or medal …….. given to the boy, though he stood first in the examination. (was / were)
9. Either Mary or Alice …… responsible for this. (is / are)
10. Neither the Minister nor his colleagues …… given any explanation for this. (have / has)

Subject-verb agreement

Complete the following sentences using a verb form that agrees with the subject in number and person.

1. Here are two pieces of shirting. Each one …….. two meters long.

is

are

2. That woman …… got two children. Both …….. girls.

has, is

have, is

has, are

have, are

3. Few girls in this village ……. to schools.

go

goes

4. Some economists believe that all …….. not well with the global economy.

is

are

5. He inherited a lot of wealth from his father, but now all ……. gone.

is

are

6. ……. all of the invitees expected to turn up?

is

are

7. I have two pens. But neither …… well.

write

writes

8. “Which of these two flats would you like to buy? “ “Either …….. me.”

suit

suits

9. Mr. Mathews is an advocate, but neither of his two sons …….. good at studies.

is

are

10. The two countries have been at war for three years now. Neither …….. to

agree to a ceasefire.

want

wants

Use the correct tense forms of the verbs in brackets and fill in the gaps:

1. She …….. (go) to church regularly.
2. Rani ……. (drink) a cup of milk every morning.
3. I usually …….. (read) biographies.
4. I …….. (read) a novel now.
5. He …… (prepare) for competitive exams for three years.
6. When I reached home, my son …… (play) with his toys.
7. I ……. (go) to my native place next month.
8. Sita …….. (eat) an apple in the morning.
9. He ……. (stand) on the bench.
10. He …… (work) on a new novel for two years.

9. He stood on the bench.

10. He has been working on a new novel for two years.

Verbs exercise

Complete the following sentences using an appropriate form of the verb.

1. The wind ……. furiously. (blew / blown)
2. He …… to his mother every week. (writes / wrote)
3. My patience …….. out at last. (wear / wore)
4. In a fit of rage, she …… up the letter. (tore / torn)
5. We couldn't have ……. a better day for organizing the party. (chose / chosen)
6. The old man was …… by a mad dog. (bit / bitten)
7. We …….. across the sea. (swam / swum)
8. A portrait of the founder of the company ……. on the wall. (hung / hanged)

9. She neatly …… her books on the table. (lays / lies)
10. The seeds of dissension had already been …… (sowed / sown)

During and while

Complete the following sentences using during or while.

Hints

During is a preposition. It is followed by a noun.
While is a conjunction. It is followed by a clause.

1. I read a lot of books …….. the summer vacation.
a) during
b) while

2. I learned some Spanish …… I was working in Spain.
a) during
b) while

3. He arrived …… I was out.
a) during
b) while

4. She called me …… the lunch break.
a) while
b) during

5. He was in hospital …….. the winter.
a) during b) while

6. I will see you for a few minutes …… the afternoon.

a) during

b) while

7. I woke up several times …… the night.

a) during

b) while

8. I will phone you …… the meeting.

a) during

b) while

9. I met him …… my stay in Canada.

a) during

b) while

10. I met him …… I was working in Canada.

a) during

b) while

Except is a preposition. It should be followed by a noun which acts as its object.

Everybody came except John. Here the noun John acts as the object of the preposition except. Except shows the relationship between ‘everybody’ and ‘John’.

Expect is a verb

I expected him to call but he didn’t.

We expect her to win the first prize.

Accept is also a verb.

She accepted the invitation.

Past and passed

Past can be used as a preposition, but passed cannot be used like this.

I walked past the school.

It is past your bedtime.

Past can also be used as an adverb. In this case, it is not followed by a noun.

A policeman walked past.

Passed is a verb. It refers to the action of passing.

She has passed the test.

Note that the word past usually refers to time or distance.

Into and Onto

The word into is a preposition. It is usually written as one word.

King Midas turned everything he touched into gold.

When she kissed the frog it turned into a handsome prince.

Sometimes the words in and to appear next to each other in a sentence. In this case, they should be written as two words.

The minister himself stepped in to avert a PR crisis. (NOT The minister himself stepped into ….)

Onto

Onto is a preposition.

He threw the hat onto the roof.

The difference between into and onto is similar to the difference between in and on.

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Gerunds or infinitives exercise

Fill in the blanks with gerunds or participles.

1. You are ……. too much these days.

a) Smoking

b) Smoked

2. There was a ……. cigarette end in the ashtray.

a) Smoking

b) Smoked

3. Having …….. for ten hours, I felt great.

a) Sleeping

b) Slept

4. Not …… what to do, I went home.

a) Known

b) Knowing

5. She went …… out of the room.

a) Run

b) Running

6. …… stamps is a hobby of mine.

a) Collecting

b) Collected

7. I hate ……. suitcases.

a) Packing

b) Packed

8. She was angry at Susie …… to lie to her.

a) Trying

b) Tried

9. The roof was ……. off in the storm.

a) Blowing

b) Blown

10. The doctor suggested …….. a long holiday.

a) Taking

b) Taken

In spite of, despite, however, though and although

Complete the following sentences using although, despite, in spite of, however or though.

1. We went out …….. the rain.

a) despite

b) in spite of

c) Either could be used here

2. We went out …….. it was raining.

a) despite

b) though

c) Either could be used here

3. The judge sent her to prison …….. the fact that she had very small children.

a) despite

b) however

c) although

4. …… I didn't enjoy the movie, I watched it.

a) Though

b) Despite

5. I enjoyed the party …….. I didn't know anybody there.

a) though

b) in spite of

6. I bought the watch, …… it was expensive.

a) however

b) though

c) Either could be used here

7. John didn't come; …….., everybody else did.

a) however

b) though

c) Either could be used here

8. …… the government refuses to admit it, it has failed to revive the economy.

a) Although

b) Despite

c) In spite of

9. He failed …… his hard work.

a) in spite of

b) though

c) however

10. I didn't like her rude behaviour. ……, I said nothing.

a) However

Comparing and contrasting

Comparing and contrasting ideas can be difficult. Different structures are possible. For example, we can compare and contrast using conjunctions, transitional adverbs and phrases. The grammar is different.

Comparison

To compare ideas, you can use the following structures.
Adverbs

Similarly, likewise, in the same way, also

Phrases Like, alike, similar, equal, comparable

Verbs

Compare to, resemble, fit, match, mirror, reinforce, reflect etc.

To express contrast, you can use the following adverbs and transitional verbs: In contrast, on the other hand, however.

The conjunctions though, although and but are also possible.

You must also pay attention to the structure of your sentences.

Notes

A transitional adverb goes between separate sentences.

Some people want a new system. However, not everybody agrees.
A dependent conjunction joins a dependent clause to an independent clause.
Two patterns are possible. Conjunction + subject + verb, subject + verb
Subject + verb + conjunction + subject + verb…
Although he is a post graduate in physics, he can’t even change a bulb.

OR

He can’t even change a bulb although he is a post graduate in physics. Coordinating conjunctions join independent clauses. Subject + verb + conjunction + subject + verb He is a post graduate in English, but he can’t even change a bulb.

A prepositional phrase normally comes at the beginning of the sentence if the phrase is an adverb. Prepositional phrase, subject + verb Subject + verb + prepositional phrase Unlike his brother, Stephen is quite interested in their family business. Be first to know when grammar rules change! Sign up to our newsletter here: englishgrammar.org (It's free)

Confusing words exercise

Fill in the blanks with an appropriate word or phrase:

1. She is …….. of her success.
(a) confident
(b) confidant
(c) confessor
2. I don’t want any …… explanation.
(a) farther
(b) further
(c) farthest
3. Is there ……. in the class?
(a) anyone
(b) no one
(c) some one
4. The doctor ……. the patients to quit smoking.
(a) advised
(b) advices
(c) told

5. He says he is enjoying his …… job.

(a) later

(b) latest

(c) latter

6. All students should have …….. to a good library.

(a) access

(b) axis

(c) excess

7. …… football, he plays cricket.

(a) Beside

(b) Besides

(c) Till

8. …… knowledge is a dangerous thing.

(a) A little

(b) Little

(c) The little

9. He is my …… brother.

(a) elder

(b) older

(c) senior

10. The sun …….. in the east.

(a) races

(b) raises

(c) rises

UNIT 7 SUMMARISING

UNIT OUTCOME: In this lesson you will learn how to summarize texts and practice summarizing for different purposes.

A summary is a short version of a long text. In an academic context, summaries are important:

* for study purposes so that you have short notes for revision;
* to show that you understand what you have read;
* to avoid plagiarism by putting something in your own words;
* to answer questions in tests and examinations when time is limited.

Summaries leave out excessive detail, lengthy examples, repetition and digressions. When you write a summary of text, you try to encapsulate what the text says.

FINDING THE ESSENCE

The noun 'capsule' refers to a very small container. To 'encapsulates' is to express the essence of a longer text or complicated idea. The following words are often used when encapsulating:

in essence ….
essentially …
to summarize….
briefly …….

When expressing the essence of an argument or text, you select only its most important ideas. The ideas you choose should be representative or indicative of the text, speech, theory, etc. that you are summarizing. The following are the processes used when encapsulating:

- Cutting out unnecessary or unrepresentative data;
- Joining up necessary and representative data;
- Using single words or phrases to replace whole sentences.

CUTTING AND JOINING

Cutting and joining is useful for study purposes. It also requires the least effort on your part. When you cut and join, you read a text and:

- draw a pencil line through parts of each sentence that are not important or which contain repetition;
- use commas, semi-colons or conjunctions like 'and' to join the parts of the text that remains

FINDING ONE WORD FOR MANY

A good method of summarizing is to find a single word or simple phrase to replace many words. For example, the phrase 'domestic problems' can refer to a whole range of problems in a home, from marital arguments to poverty and abuse. The phrase 'political actions' can refer to actions ranging from peaceful protest to sabotage.

You can write the word or phrase in the margin of the text you are studying to remind you of what a paragraph is about. You can also use the word or phrase in a written summary.

SUMMARIZING IN YOUR OWN WORDS

When you summarize in your own words, you

- reorganize the information in a text to suit your purpose;
- cut and join;
- find one word or phrase to replace many;
- paraphrase a text using simpler or different language.

CONCLUSION

In this lesson you worked from a method of summarizing that uses the words of the original text to a method which requires your own words. In the time capsule activity you selected items from your own life in order to encapsulate your day. In the next lesson you will use these summary skills to communicate in a business environment.

Summarize the following texts:

(1) Crime and punishment

Executions were often carried out in front of large audiences – a practice that persisted well into the eighteenth century in some countries. Those who were to be done to death would be drawn through the streets in an open chart, to meet their end as part of a well-publicized spectacle, at which crowds would cheer or hiss, according to their attitude towards the particular victim. Hangmen were public celebrities, having something of the fame and following conferred on film stars in modern times.

Today, we find such modes of punishment completely repellent. Few of us could imagine actively gaining enjoyment from watching someone being tortured or violently put to death, whatever crimes they might have committed. Our penal system is based on imprisonment, rather than the inflicting of physical pain, and in most Western countries the death penalty has been abolished altogether. Why did things change? Why did prison sentences replace the older, more violent forms of punishment?

It is tempting to suppose that in the past people were simply more brutal, while we have become humane. But to a sociologist, such an explanation is unconvincing. The public use of violence as a means of punishment had been established in Europe for centuries. People did not suddenly come to change their attitudes towards such practices ‘out of the blue’; there were wider social influences at work, connected with

major processes of change occurring in the period. The European societies were then becoming industrialized and urbanized. The old, rural order was being rapidly replaced by one in which more and more people worked in factories and workshops, moving to the rapidly expanding urban areas. Social control over urban-based populations could not be maintained by older forms of punishment, which, relying on setting a fearful example, were only appropriate in quite tightly knit, small communities where the numbers of cases were few.

Prisons developed as part of a general trend towards the establishing of organizations in which individuals are kept 'locked away' from the outside world as a means of controlling and disciplining their behavior. Those kept locked away at first included not only criminals, but vagabonds, the sick, unemployed people, the feeble minded and the insane. Prisons only gradually came to be separated from asylums and hospitals for the physically ill. In prisons, criminals were supposed to be 'rehabilitated' to become good citizens. Punishment for crime became oriented towards creating the obedient citizen, rather than publicly displaying to others the terrible consequences which follow from wrongdoing. What we now see as more humane attitudes towards punishment tended to follow on from these changes, rather than causing them in the first place. Changes in the treatment of criminals were part of the processes which swept away traditional orders which people had accepted for centuries. These processes created the societies in which we live today.

(*Sociology* by Anthony Giddens, 1995, pages 10-11)

(2) A Revolution in Knowledge Sharing

The pressure to transform our institutions of learning continues. Virtually every enterprise and institution is grappling with the disruptions and opportunities caused by Web-enabled infrastructures and practices. New best practices, business models, innovations, and strategies are emerging, including new ways to acquire, assimilate, and share knowledge. Using technologies that are already developed or that will be deployed over the next five years, best practices in knowledge sharing not only are

diffusing rapidly but will be substantially reinvented in all settings: educational institutions, corporations, government organizations, associations, and nonprofits. But institutions of learning are in a unique position to benefit from an added opportunity: providing leadership in e-knowledge.

E-knowledge finds expression in many shapes and forms in a profoundly networked world. It is not just a digitised collection of knowledge. E-knowledge consists of knowledge objects and knowledge flows that combine content, context, and insights on application. E-knowledge also emerges from interactivity within and among communities of practice and from the troves of tacit knowledge and tradecraft that can be understood only through conversations with knowledgeable practitioners.

E-knowing is the act of achieving understanding by interacting with individuals, communities of practice, and knowledge in a networked world. E-knowledge commerce consists of the transactions based on the sharing of knowledge. These transactions can involve the exchange of digital content/context and/or tacit knowledge through interactivity.

Transactable e-knowledge can be exchanged for free or for fee. E-knowledge is enabling not only the emergence of new best practices but also the reinvention of the fundamental business models and strategies that exist for e-learning and knowledge management. E-knowledge is technologically realized by the fusion of e-learning and knowledge management and through the networking of knowledge workers.

Transactable e-knowledge and knowledge net-working will become the lifeblood of knowledge sharing. They will create a vibrant market for e-knowledge commerce and will stimulate dramatic changes in the knowledge ecologies of enterprises of all kinds. They will support a “Knowledge Economy” based on creating, distributing, and adding value to knowledge, the very activities in which colleges and universities are engaged. Yet few colleges and universities have taken sufficient account of the need to use their knowledge assets to achieve strategic differentiation.

In "*It Doesn't Matter*," a recent article in Harvard Business Review, Nicholas G. Carr endorsed corporate leaders' growing view that information technology offers only limited potential for strategic differentiation. Similar points are starting to be made about e-learning, and knowledge management has been under fire as ineffectual for some time.

The truth is that e-learning and knowledge management can provide strategic differentiation only if they drive genuine innovation and business practice changes that yield greater value for learners. Carr's article provoked a host of contrary responses, including a letter from John Seely Brown and John Hagel III. Brown is well-known for his insights into the ways in which knowledge sharing can provide organizations with a solid basis for strategic differentiation.

Read the article and complete the summary below. For questions 1-4, choose NO MORE than TWO WORDS for each answer.

UNIT 8 ACADEMIC GENRE

At the end of this unit students should be able to :

- **recognize text structures of academic texts.**
- **be able to read through academic texts.**

1. When reading through different academic genres, students need to know what they use the information for.

- to begin to focus my thoughts?
- as background information?
- to use as evidence?
- for locating other sources?
- as my central argument?

2. How recent is this material?

- Is it the latest?
- Does it need to be the latest?

3. What authority does the author have?

- Is he/she one of a few writing in this field?
- Is she/he one of many writing in this field?
- Is this person an acknowledged expert?
- Is this person making an original contribution?

4. Does the source of this material add to its value or usefulness?

- Does this material come from a key research centre/university?
- Does this material come from a reputable source?

5. How understandable is this material?

6. Does this add to my knowledge?

7. Do I really need to use this?

- Have I already supported my argument or point of view well enough?
- Do I have enough information to begin my task?

8. Note-making and note-taking

Many students complain that they read the set readings each week, but by the time they get to class they have forgotten everything. Similarly, when it comes to writing an assessment they can't remember where they saw a particular quote.

The note-taking/note-making strategy below allows the student to reflect on the article and add their own views. This process help students write because they can review how they responded to the article and will be able both to develop a more sophisticated argument and avoid plagiarising.

9. Using a note-taking scaffold

A good way to use this scaffold is to set it as a task for seminar groups. You can either get students to develop their own scaffold or email a blank scaffold to the group to complete. Each week they need to bring in a completed scaffold for each of the readings. It will help students to remember what they read and to contribute to the discussion.

10. Note-making scaffold

Bibliographic details: Note down the author's surname and initial, the title of the book/article, publisher, place, key themes, journal and date read.		
Notes: This is where you write the main points from the text.	**Page number**	**Comments on information**
Paraphrased notes should form the bulk of the information that is included in this section. (Paraphrasing means to rewrite somebody else's ideas in your own words). Direct quotes also may be written here. Make sure that you put inverted commas around the quote to remind you that it is somebody else's words copied verbatim (word for word).	Always remember to include the page number.	This is where you think critically and reflectively about the text. • How does this information relate to other texts that I have read? • What important links can be made to the topic/ other research? • How is the information relevant? If it isn't relevant should I be reading it at this time? • Does the author say anything new or interesting? • Is there anything that I don't understand that I need to follow up? • Is the author saying anything that I disagree with, and why do I disagree with it? • Is the author saying anything that contradicts the findings/ opinions of other authors? • What conclusions can I make from the points being made?

11. Academic genre, tone, modality and plagiarism

The purpose of this section is to provide a brief overview of the genre of academic writing.

Many members of our student community arrive on campus with a wide range of academic, workplace and school experiences.

Students often benefit from being provided with clear guidelines about what academic writing is and what it is not – especially before the first assessment.

12. Academic genre

The academic genre of writing is unique to the university context and has its own style. Its formality and structure support the main purpose of many written assessment tasks: to build an academic argument. The students' use of references, topic sentences, quotes, paraphrases, synthesis and explanations shows to the audience (you, as the marker) that they have undertaken research, have thought critically about a topic and have built a logical response to a question. The formal structure of the academic genre makes it easy to verify these student activities: it also makes particular demands on a student's writing and textual organisation skills.

Characteristics of the genre

The academic genre:

- is formal in language choice
- uses complete sentences
- avoids colloquial language, spoken expressions and clichés
- uses complete paragraphs
- uses elaboration, explanation and synthesis of ideas
- is based on research-supported points
- uses subject- or field-specific language to the extent that it may be difficult for a person outside the area to fully understand the text

13. Tone

It is crucial that students understand how the tone of a piece of writing is reflected in the words they choose. Highlight the different levels of formality in writing between job It is very much important to acknowledge the different tones learners bring to class. applications and emails to friends or posts on Twitter or Facebook, explaining how audience and purpose determine our tone.

14.Characteristics of academic writing

Academic writing is

highly nominalised – this means using nouns or noun phrases instead of verbs:

General writing uses verbs:

The audience **believed** *that* **using** *cleaning products* **affected** *the environment* **negatively**.

Academic writing uses nominalisations:

The belief *of the audience was that* **the use** *of cleaning products had* **a negative effect** *on the environment.*

Academic writing is often in **third person**, avoids personalisation and uses a passive construction – don't use *I, my, our, we, you mine,* or *me*

General writing is usually personalised:

We can *see the changes on* **our society.**

Academic writing is personalised:

The changes on **society can be** *seen.*

Academic writing **avoids contractions** (such as *can't* or *haven't*).

The choice of words reflects the tone: **formal vocabulary** is used in academic writing. Academic writing avoids using punctuation, such as exclamation marks and typing in capitals, to show **emotion**.

Getting the tone to sound 'academic' takes a lot of practice, because students normally use informal language in their daily communication and so may also use an informal tone when they start writing at university. Be explicit, then, about your expectations, and show students some examples of the differences between formal and informal writing.

The academic writing genre, as previously stated, relies heavily on formal vocabulary. Table 2 provides common examples of non-academic vocabulary and some substitutes.

Table 2: Academic vocabulary

Non-academic vocabulary	**Academic vocabulary**	**Non-academic vocabulary**	**Academic vocabulary**
look at	observe	get rid of	eliminate
go up	increase	look into	Investigate, examine
build up	accumulate	bring up	raise
set up	establish	a lot, lots of	numerous, copious
cut down	*reduce*	*go up and down*	*fluctuate*

An opinion in academic writing should be based on the evidence the writer has collected. The level of modality used to express an opinion should match the level of certainty provided by the evidence.

It might be appropriate to make a strong modality claim because evidence from multiple sources backs up an opinion. Many people use a combination of levels, as this is 'safe'. Students tend to use weak modality when they start writing: if you explain to them how modality affects their writing, they can manage the impact of their word choice on their

argument. Note that in some cases students may need to use tentative or weak modality to show weaknesses in an argument or to show a negative situation.

Three levels of modality

The three levels of modality (Table 3) are:

1. Strong modality: 75–100% certainty (***will, must, certainly, never, definitely***)
2. Moderate modality: 50–100% certainty (***can, usually, should, normally***)
3. Tentative or weak modality: 0–50% certainty (***may, possibly, conceivably***)

Table 3 Levels of modality

Level of certainty	Modal verbs/adverbs/terms	Statement of claim
Strong	*is, will, cannot, must, undoubtedly, always, never, undeniable, definitely, clearly, unreservedly, seriously, obviously, unquestionably, all,*	*It is certain that …* *It is clear that …* *X is definitely …* *X is never …* *The results indicate that…* *To a great extent…* *To a large extent…*
Moderate	*should, most, a significant proportion, numerous, would, can, ought to, tends to, usually, likely, surely, probably, regularly, majority, generally, often, frequently, rarely, presumably, evidently, frankly, fortunately, unfortunately*	*It appears certain that …* *It is usually the case that…* *In the majority of situations…* *The results suggest that …* *To a certain extent …* *To a significant extent …*
Tentative	*may, might, could, possible, conceivable, sometimes, occasionally, seldom, perhaps, maybe, uncertainly, minority, somewhat, potentially, apparently*	*Conceivably...* *It is possible that …* *A small proportion of…* *The results are not conclusive …* *It is unlikely that …* *Occasionally…* *It may be the case that It appears probable …*

3. Assignments and assignment questions

> Written assignments are the primary focus of the student's development in academic literacy.

Students will come across a range of assessments at university, with **essays**, **reports** and **case studies** being the most common written assessments. Some features of these assignment types are identified below (Table 4). Note that this is a generic outline and different faculties may have different expectations.

First-year students may or may not have written these types of assignment before. School assignments tend to be more descriptive than university essays. Mature-age students and international students may not be aware of the format and/or expectations of a particular assignment type.

It is often useful to show students models of a 'good' assignment type – seminars and tutorials are a good place to do this – so that they have an idea of what to aim for. However, it is best *not* to provide students with take-home copies or to make models accessible online, as there is a tendency to copy these models word for word.

Table 4 Assignment type

Essay	**Report**	**Case study**
Aim is to persuade or convince the audience Introduction Body Conclusion No headings Does not normally include visuals	Aim is to inform or report on an event, object or situation Clear headings Sections dependent on subject and report type Use of tables and figures	Aim is to respond to a case using theories and analysis Cases can be real or fictional May or may not require headings - depends on length and context. This style of assessment is varied.

4. Recommendations (follow on)

The recommendations can appear under the 'Conclusion' section or under a separate heading. Here the students outline what the report indicates should happen in the future: what is the preferred model and course of action? They need to be persuasive to convince their audience.

5. References (follow on)

This is a list of references with complete bibliographic details according to faculty guidelines. Students should not just copy and paste weblinks.

6. Appendix (separate page)

This is where students include data and materials relevant to the report, such as questionnaires, data and results. Students need to mention the items in the appendix when relevant in the body of the report. Each additional resource is a new appendix, so students may end up with two or three appendices. Students should start each new appendix on a new page.

5. The essay

The ability to communicate ideas effectively is a fundamental skill of academic writing. A solid structure enables a student to communicate their ideas and argument to their audience clearly.

There are three sections in a university essay: introduction, body and conclusion.

1. Introduction

- The introduction provides the reader with an outline of the essay.
- Students should mention their main points and give an indication of their conclusions.
- Students should directly engage with the question.
- Students should provide a clear statement of the thesis or argument and clearly establish the lines of discussion.

2. Body

Within the body, the sStudents answer the essay question by developing an argument sequentially.

- The students support assertions with evidence.
- Each paragraph should deal with one main idea.
- Paragraphs should progress logically towards a conclusion.

3. Conclusion

- The conclusion should bring together the main points of the essay and reiterate the answer to the question.
- It should not introduce any new material.
- It should add strength to the essay by clearly summing up the arguments and making a final comment.

6. Reflective thinking

The concept of reflective thinking is credited to Dewey. Dewey's (1933) definition of reflective thinking is 'active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusion to which it tends'.

Reflective thinking is an ongoing (iterative) process in which an individual consciously thinks about his or her own knowledge and the gaps in his or her knowledge, assumptions, and past experiences. At university, this usually links readings, course notes and lectures and practical experience with theories in the field.

In the process of reflective thinking a student will (Figure 2):

- Identify gaps in current knowledge – determine what information is needed for understanding the issue at hand.
- Conduct a literature review – access and gather the available information and opinions of reliable sources in relevant fields.
- Make notes and summarise literature – synthesise the information and opinions.

- Identifies relationships and evaluates synthesis – considers the synthesis from all perspectives and frames of reference and considers this in relation to current beliefs, attitudes and knowledge.
- Develop a 'working' understanding – creates plausible (temporary) meaning that may be reconsidered and modified as he or she learns more relevant information and opinions. As states earlier, reflection is iterative in that there will be cycles of reflection and redesign of ideas as new information is accessed or experienced and processed.

. **Table 5 Essay introduction – example**

(The introduction in this example would be one continuous paragraph.)general statement	*The theory of engagement is a fundamental learning theory that suggests that students need to be engaged to learn.*
orientation to topic	*Engagement is the process of applying attention to a task. Student engagement occurs when students make a psychological investment in learning.*
thesis	*The purpose of this essay is to define the theory of engagement and to then analyse and discuss several methods of engaging students in the high school classroom.*
outline 1	*Firstly, the theory of engagement will be discussed in relation to theories of motivation and student behaviour.*
outline 2	*Secondly, this essay will outline several engagement strategies used in the documentary 'The classroom experiment'.*
outline 3	*Finally, an analysis of a case study will be presented.*

6.1 Reflective thinking and reflective writing

> Reflective writing is becoming more popular as an assignment type because it allows students to respond in their own voices to experiences and information encountered during a unit.

Reflective writing is popular in education and health sciences as both of these professions are centred on reflective practices.

Reflective writing

Generally, a *reflective writing* assignment requires a student to consider the connection between three different aspects of the topic or subject that they are studying:

1. the topic
2. how it connects to other aspects or concepts in this unit
3. how it makes sense (or does not make sense) to the student

Reflective writing is:

- a response to the student's own experiences, opinions or events – not those of other authors
- where thinking about their learning takes place – building self-knowledge
- a student's response to thoughts, feelings, other forms of awareness and new information
- a way to achieve clarity and better understanding about unit materials.

Reflective writing is not:

- information, instruction or argument
- pure description, though there may be descriptive elements
- a straightforward decision or judgement, for example whether something is right or wrong, good or bad • simple problem-solving
- a 'normal' university essay.

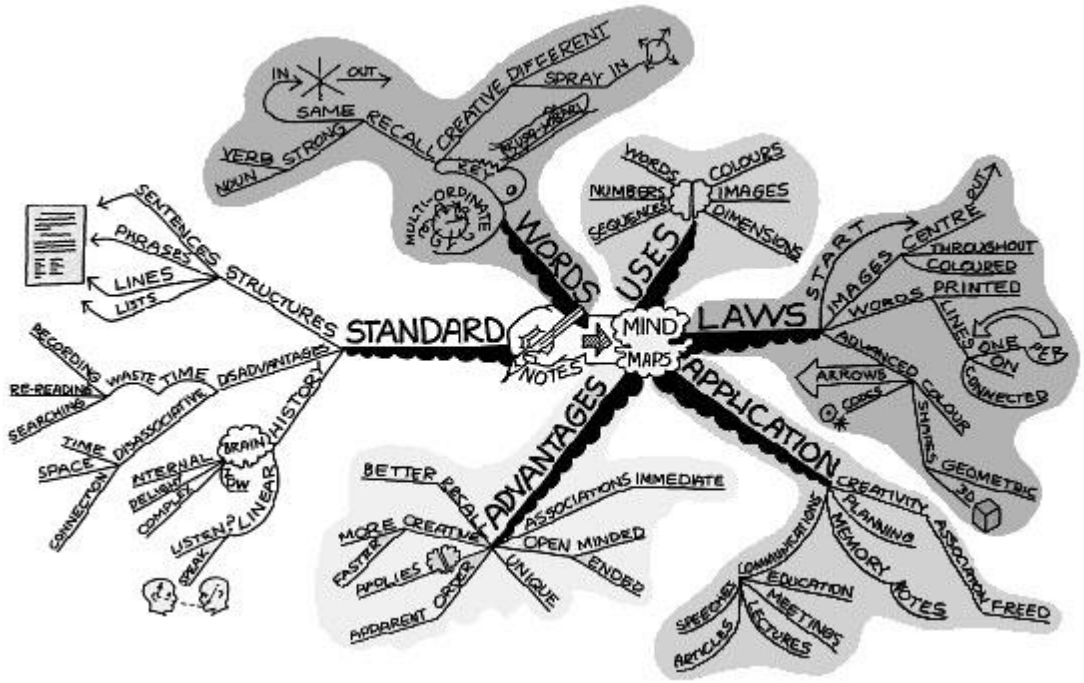
What can be discussed in reflective writing?

- a student's perceptions of the unit and about what they are learning
- experiences, comparisons, connections, ideas and observations they have had, and how they relate to the unit
- questions that students have and conclusions that they draw
- what they have found confusing, inspiring, difficult, or interesting, and why
- problem-solving – how a student reached a conclusion, found an answer or reached a point of understanding
- alternative interpretations or different perspectives on what students have read or done in their unit
- how new ideas challenge what a student already knows

Mind mapping

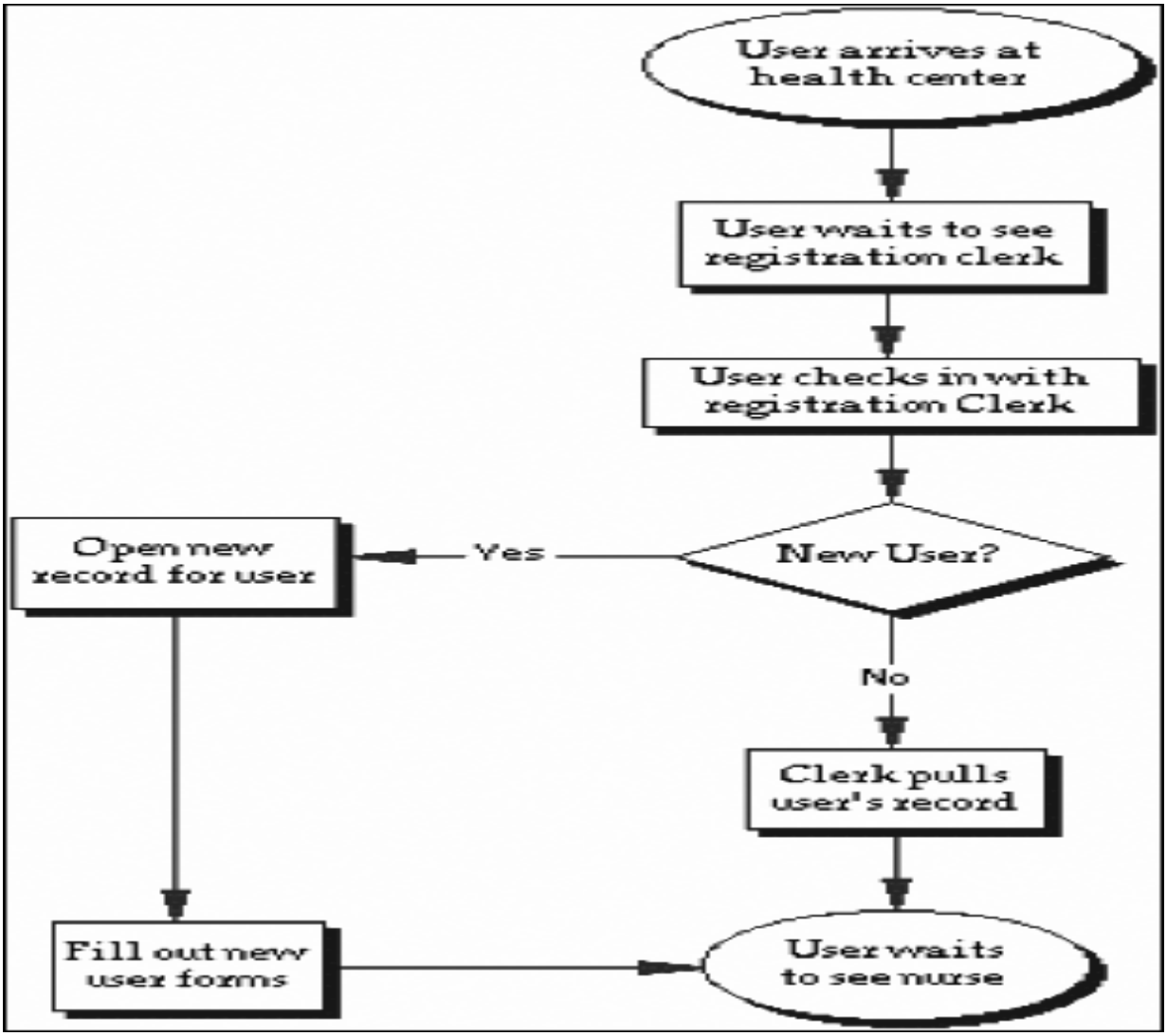
Mind mapping is a simple strategy to elicit ideas and information around a central theme or idea. The point is not to organise ideas, but to see where the relationships are and the gaps. Mind mapping is also often used by teachers to see what prior knowledge students have about a topic. It is a useful strategy for group work.

Source: *Adapted from Buzan, T. (2010). Mind map gallery. Retrievedwww.thinkbuzan.com*



Flow charts

Flow charts are a useful way to map out a process. For example, if a student reads a text on patient admissions, they can develop a flow chart of the process.

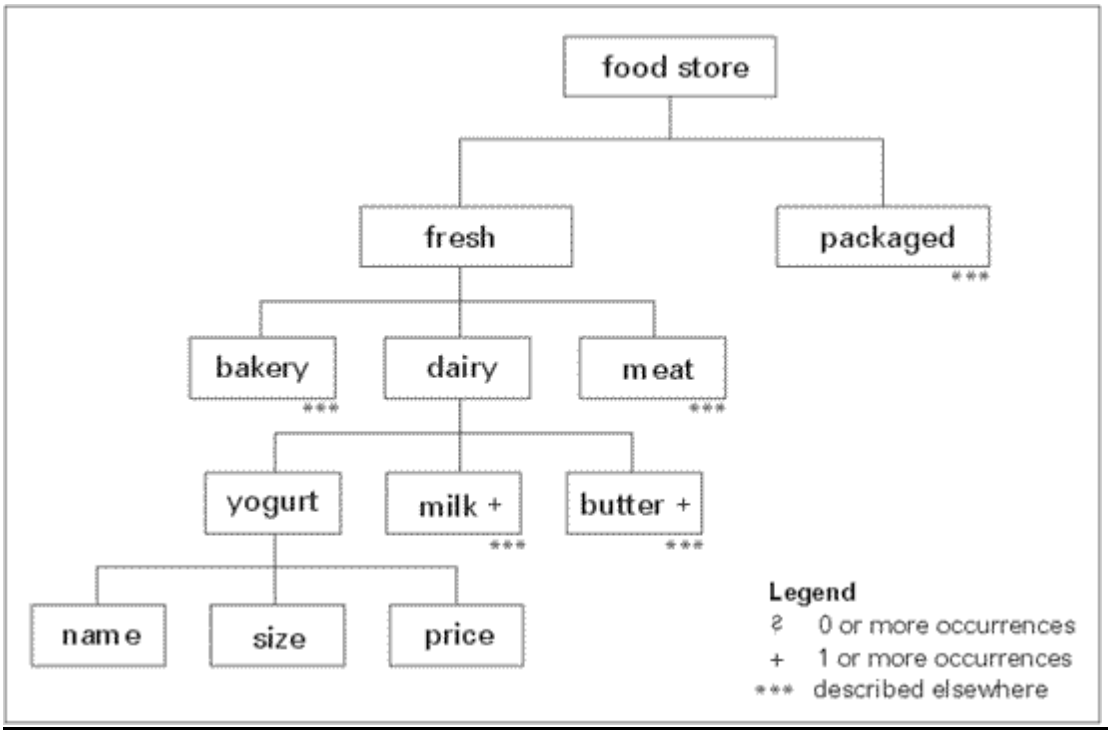


Source: Adapted from *The Manager's Electronic Resource Centre*, Management Sciences for Health, Retrieved from http://erc.msh.org/quality/graphics/flowchart2.gif

Branch diagrams

Branch diagrams are a useful graphic organiser to help students see hierarchies and categories of information, what the main points are and what the subcategories are. It is best if they go down to at least three levels in order to get a high degree of specificity**.**

Source: Adapted from Bartz, J. (2002). Great Idea, but how do I do it? A practical example



learning object creation using SGML/XML. *Canadian Journal of Learning and Technology*, 28(3). Retrieved from http://www.cjlt.ca/index.php/cjlt/article/view/102/95

c. One influential language teaching methodology topic is grammar translation [controlling idea].

The essay is discussing language teaching methodologies and this paragraph will explore grammar translation.

Elaboration

One problem that students have when writing is that they assume that the reader can follow their train of thought. One way to overcome this jump from topic sentence to example is to use elaboration. Elaboration occurs when you explain or define the topic sentence and the main point of a paragraph. Elaboration is an important part of academic writing as it helps to:

- develop the argument
- make sure that the audience understands a point of view
- show the logic supporting the choice of examples and evidence.

Examples of elaboration

Text 1 – Language teaching methodologies

This paragraph does not explain the main point.	**This text does not contain elaboration:** *One influential language teaching methodology is grammar translation [topic sentence]. For example, in China and Japan, grammar translation is popular due to the large class sizes [supporting example].*
This paragraph explains what grammar translation is.	**This text contains elaboration:** *One influential language teaching methodology is grammar translation [topic sentence]. Grammar translation is a methodology that is derived on the basis that individuals learn a language by repeating and rote learning complete grammatical structures. One benefit of grammar translation is that one teacher can instruct numerous*

	students [elaboration]. For example, in China and Japan, grammar translation is the preferred methodology due to the large class sizes and the limited availability of teaching resources [supporting example].

Paraphrasing

Paraphrasing is the use of another person's work in a piece of writing where the meaning is not changed, but the words are, and so it is not a direct quotation. Just as when quoting, the source text being paraphrased must be referenced, including the page number.

Paraphrasing a short section of text (a sentence, a couple of sentences or a paragraph) allows the student to demonstrate their understanding of the material they are reading by pulling its ideas and meanings into their own analysis and argument.

Unlike a summary, a paraphrase is usually about as long as the original text (Table 11).

1 The reference for these examples is: Kalantzis, M. and Cope, B. 1993, 'Republicanism and Cultural Diversity' in *The Republicanism Debate*, (eds) W. Hudson and D. Carter, New South Wales University Press, Sydney.

Functions of concluding sentences:

1. To re-state the topic sentence

Thus, there have been numerous changes in Australian society in regards to gender and equality.

Therefore, there have been numerous changes to bicycle design recently.

2. To summarise the main point or issue that is raised in the body

In brief, it is evident that Australian society is cohesive to a limited extent in regards to the religious and cultural values of migrants.

Consequently, it is evident that the changes in bicycle technology over the past ten years are a result of using similar technology to that used in aircraft construction.

3. To make links to the following paragraph

Thus, there have been numerous changes Australian society in regards to gender and equality and these changes are also reflected in education policies.

Thus, there have been numerous changes to bicycle design recently and the impact of these changes is evident in competitive bike riding.

Putting it all together

Below is an example of an assertion elaboration paragraph that ties together the elements outlined in this section.

Example paragraph with elements: To Be a Hero

Paragraph element	**Paragraph text**
Topic sentence assertion	*In order to be considered a hero a person must display extraordinary physical or intellectual powers.*
Elaboration	*The physical hero is one who exhibits great strength to overcome opposition to become a victor: such examples are often found in sporting lore and folktales.*
Supporting example	For example, Cathy Freeman's gold medal 400 metre run in the 2000 Sydney Olympics; even though she was placed as the favourite, she overcame racial, social and physical obstacles to secure her place on the podium (ACERA, 2009).

Paragraph element	Paragraph text
Tie to topic sentence	*Securing the gold medal made Cathy a physical hero and is one the great moments in Australian Sporting History.*
Elaboration	*A second heroic type is the intellectual; this person is admired for his or her contributions to society. Marie Curie discovered the mysterious element radium.*
Supporting example	*It opened the door to deep changes in the way scientists think about matter and energy (Jones, 2011).*
Tie to topic sentence	*Furthermore, she also led the way in a new era of medical knowledge and the treatment of diseases, thus becoming an intellectual hero (Morgana, 2010).*