A STUDY OF THE READING PERFORMANCE OF FIRST-YEAR ESL STUDENTS AT THE BORDER TECHNIKON

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by

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who regrettably never saw the study to completion.

SUMMARY

This study focuses on the ongoing debate about the relationship between language proficiency and academic achievement. More specifically, it focuses on the strength of the relationship between the academic performance of previously disadvantaged students in South Africa and their reading proficiency in English, which is the language of instruction used at most South African tertiary institutions.

This study attempts to answer three questions:

1) How does the reading performance of first-year ESL students at the Border Technikon compare with the national average obtained by senior secondary school pupils over all population groups?
2) Are the marks obtained by these students in their respective courses related to their reading performance?
3) Do students show any improvement in reading performance after attending the reading laboratory for six months?

The sample group consisted of 156 first-year ESL students at the Border Technikon. It was found that the English reading proficiency of almost 50% of these students was below the national average obtained by senior secondary school pupils over all population groups. A correlation of the students' reading performance levels with their first-year academic results revealed that a positive, statistically significant relationship existed between reading performance and academic achievement. However, the relationship was modest. The study also found that students did not show any improvement in reading proficiency after attending the reading laboratory for six months. Recommendations for improvement are made.

OPSOMMING

Hierdie studie fokus op die debat oor die verhouding tussen taalvaardigheid en akademiese prestasie. In die besonder fokus dit op die omvang van die verhouding tussen die akademiese prestasie van voorheen benadeelde studente in Suid-Afrika en hul leesvaardigheid in Engels, die taal wat by die meeste Suid-Afrikaanse tersiêre inrigtings vir onderrigdoeleindes gebruik word.

Hierdie studie trag om drie vrae te beantwoord:

1) Hoe vergelyk die leesvaardigheid van eerstejaarstudente aan die Border Technikon met die nasionale gemiddelde van senior sekondêre skoolleerlinge oor alle bevolkingsgroepe?
2) Hou die punte wat hierdie studente in hul onderskeie kursusse behaal enigsins verband met hul leesvaardigheid?
3) Toon studente enige verbetering in hul leesvermoë nadat hulle die leeslaboratorium ses maande lank bygewoon het?

Die steekproef het bestaan uit 156 eerstejaarstudente aan die Border Technikon, vir wie Engels 'n tweede taal is. Daar is gevind dat die leesvaardigheid, in Engels, van bykans 50% van hierdie studente swakker is as die nasionale gemiddelde van senior sekondêre skoolleerlinge oor alle bevolkingsgroepe. 'n Korrelasie van die studente se leesvaardigheid met hul akademiese resultate aan die einde van hul eerste studiejaar het aangedui dat 'n positiewe, statisties beduidende verhouding tussen leesvaardigheid en akademiese prestasie bestaan. Die verhouding was egter beskeie in omvang. Die studie het ook gevind dat studente geen verbetering in leesvaardigheid getoon het nadat hulle die leeslaboratorium ses maande lank bygewoon het nie. Aanbevelings vir verbetering word aan die hand gedoen.

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INTRODUCTION

1.1 Contextualization

Enormous inequalities in the South African education system have resulted in large numbers of seriously under-prepared students entering tertiary education (compare De Villiers, 1996:135; Perkins, 1991:231; Court, 1988:8 and Olivier, 1998:59). Foster and Leibowitz (1998:81) state that although apartheid as a government policy no longer exists, "its legacy remains in the schools and with the graduates of these schools, who are now in our universities".

The language barrier faced by second-language learners, especially black students graduating from schools that were governed by the former Department of Education and Training (DET), is an important aspect of this multi-faceted problem. Tertiary students who are not fluent in English, the language of instruction at most tertiary institutions, are at a disadvantage. They depend heavily on lectures delivered in English to be able to complete their studies successfully. Such students find it difficult to express themselves in English, and are also constrained when it comes to approaching their lecturers for guidance, or taking part in class- or group discussions (Foster & Leibowitz, 1998:90).

- Of the four basic language skills, i.e. reading, writing, listening and speaking, reading is probably the most important for second language learners in an academic context (Kilfoil, 1997:181; Rance-Roney, 1995). Students have to be able to read accurately at a reasonable speed. Even more important, students have to be able to comprehend what they read. Perkins (1991:231)

highlights the importance of reading comprehension as follows: "Reading skill is the necessary input which precedes written output; before students can produce academic or standard written English, they must be able to comprehend it."

Tertiary students sorely need good reading skills because of the large volume of reading material they have to deal with. Apart from the study of numerous textbooks, students at the tertiary level are also expected to do supplementary reading by consulting reference works and journals. Good reading skills are furthermore needed to reduce "the hazards of time pressure" causing the misreading or poor comprehension of questions when students are writing tests (Bouwer, 1992:12).

The reading of academic material in a language not fully mastered poses a major problem to English Second Language (ESL) students. Indications from research are that study guides and textbooks written in English are not readily understood. Supplementary reading probably falls by the wayside. Questions in test papers are bound to be misunderstood at times. From this perspective, it becomes clear that students who are not competent readers of English are likely to be restricted in many aspects of their academic lives.

From the arguments presented so far, two propositions emerge:

a) An adequate level of competence in the language of instruction is vital for students to be able to understand lectures and to communicate with their lecturers.

b) An adequate level of reading proficiency in the language of instruction is very important for students to study the available textual

information, to understand written instructions and to formulate responses when writing tests and examinations.

However, the extent to which reading performance *predicts* academic success remains controversial.

There seem to be at least three different schools of thought on this issue:

The first group links reading performance to academic achievement. This group is concerned that many students are not able to read English fluently and correctly, and regards this as the main cause of the poor academic results students obtain. Bender and Coetzee (1995:163) endorse this view in their assertion that "a pupil with reading problems at secondary school will be aware daily of his or her inadequate ability to read, owing to underachieving in all the study activities that require reading abilities". The findings that emerged from Kokong's (1991) research also seem to support the existence of a positive relationship between reading ability on the one hand and academic achievement in English (as a second language) and other subjects on the other.

The second group, to which Royer *et al.* (1987) belong, argues that there is a strong correlation between students' performance in subject-related reading comprehension and their academic performance in that particular subject. However, Royer *et al.* found no correlation between subject-related reading comprehension and general academic achievement.

Court (1988), who can be considered a representative of the third group, states that, in heterogeneous student populations, students' academic performance in the subject English I cannot be predicted with any degree of

confidence on the basis of their language proficiency. Such heterogeneous conditions are found in South Africa today where tertiary students' educational backgrounds differ widely, with many students coming from disadvantaged communities.

Does the academic success of South African students in tertiary education depend on reading proficiency in the language of instruction? The present study investigates this matter among first-year students at Border Technikon.

1.2 Background to the study

At present, the majority of students at the Border Technikon are drawn from educationally disadvantaged communities. Coming mostly from ex-DET schools with underqualified teachers and inadequate facilities, many of the students are ill equipped for tertiary study. In a recent survey of the academic background of 106 Border Technikon students, it was found that almost 50% of the students came from a high school without library facilities, and only 20% of the students were members of a municipal library (Smith, 1999:4). Although none of the students surveyed were first-year students, more than 50% indicated that they considered rote learning to be the best way to prepare for a test or an examination, and nearly 25% felt that it was the lecturer's responsibility to ensure that students passed their courses (Smith, 1999:4). These facts shed some light on the poor educational background to which most of the Border Technikon students have been subjected and the misconceptions many of them have developed about their role in the educational process. The students are predominantly Xhosa speaking, and as a rule are not proficient in English, which is used as the medium of instruction at the Technikon. Perhaps because their English skills are weak or because they fear revealing some ignorance on their part, they are hesitant to

ask questions in class and to participate in class discussions. Instead of actively taking part in the instructional process, they tend to be passive learners who are "unwilling or unable to find information without considerable coaching" (Smith, 1999:4).

The Border Technikon recognized the need for students to develop their language skills. As part of a broader Student Academic Development Programme, the Communications Department at Border Technikon has initiated a Language Development Programme to assist first-year students with English language skills that are insufficiently developed. The Language Development Programme is aimed at developing students' English language skills through regular reading practice. The objectives of the programme are to improve overall reading ability, to increase reading speed, to develop higher-order comprehension skills, and to build vocabulary. It is expected that an improvement in students' language skills will result in additional benefits such as increased confidence, improved self-esteem, greater understanding of textbooks and lectures, greater participation in the learning process, higher grades, and improved pass rates.

There are currently thirteen "reading laboratories", each of which is equipped with 24 personal computers on which specially selected language development software is run from the central network.

The two software programmes used are "Reading Strategies for Windows" and "Quantum Reading Series". Both are graphic-rich, highly interactive reading enrichment programmes aimed at helping students acquire the skills they need for fluent reading. "Reading Strategies for Windows" has six levels of difficulty, ranging from levels D to I. The more difficult version, "Quantum Reading Series", offers another four levels from J to M. Students

progress from lesson to lesson and from level to level at their own pace. Various activities, such as selected reading, word games, spelling checks, cloze exercises and multiple-choice comprehension checks, are included.

During weekly laboratory sessions of 45 minutes each, students are expected to work independently, although under supervision, on the above software programmes, progressing from the one module to the other as their reading ability improves. The computer records each student's individual progress. Students also record their results manually on a progress sheet provided by the lecturer.

Not all first-year students are able to participate in the Language Development Programme, because of limited seating capacity in the laboratories, timetable problems, and limitations in the funding allocated to the Communication component of students' programmes. For instance, in the 1999 academic year, only 810 of the 1680 first-year students whose courses required an English Communication component could be accommodated in the reading programme.

The introduction of the Language Development Programme was an attempt to address the needs of Limited English Proficiency (LEP) learners at the Border Technikon. The effectiveness of the programme still needs to be determined. One aspect of this study is to investigate how well the objectives of the programme are being met.

1.3 Problem statement

At the root of the problem is the lack of empirically-determined data that allow an assessment of the extent to which the reading skills of first-year ESL

students at the Border Technikon are deficient, if at all. The proposition on which the Language Development Programme of the Communications Department is based, i.e. that inadequate reading skills contribute to poor academic performance, has not been empirically proven at Border Technikon. The present study tests this proposition by determining the correlation between the two variables.

For the purposes of monitoring and reporting on the success of the Language Development Programme, it is important to ascertain whether first-year ESL students at the Border Technikon do indeed benefit from regular attendance of the reading laboratory. The present study therefore determines whether there was any improvement in students' reading performance over a specific period of time.

1.4 Purpose of the study

Specific questions to be answered are:

- How does the reading performance of first-year ESL students at the Border Technikon compare with the national average obtained by senior secondary school pupils over all population groups?
- Are the marks obtained by these students in their respective courses related to their reading performance?
- Do students show any improvement in reading performance after attending the reading laboratory for six months?

The purpose of this study is:

a) to empirically assess the reading performance of first-year ESL students at the Border Technikon;

b) to determine the relationship between the reading performance and academic achievement of these students;

c) to evaluate the impact of the existing Language Development Programme on these students' reading performance over a six-month period.

1.5 Procedure

1.5.1 Research subjects

The target population consists of 1680 first-year ESL students at the Border Technikon, of which a sample of 156 was purposively selected. The need to have regular contact with the participants in the project was the single most important factor that guided this purposive selection of participants. The sample thus drawn was sub-divided into an experimental group, and a control group, based on whether or not reading laboratory attendance was a prerequisite for their respective courses. All research subjects were required to complete both the reading performance pre-test and post-test.

1.5.2 Research methods

A multi-method approach was adopted in this study:

a. Firstly, a review of related literature in the field was undertaken to ascertain what had already been done at other institutions. The following computer database searches were conducted: ERIC, NEXUS, GKPV, RSAT, EDI, EBSCO.

b. A standardised reading performance test was used to assess the reading skills of first-year Border Technikon students.

c. A quasi-experimental pre-test/post-test method, using a non-randomized control group, was subsequently used to determine the impact of the existing Language Development programme on students' reading performance over a six-month period.

d. A correlation was carried out between students' reading performance and their academic achievement. For this purpose, academic progress reports were obtained from the Technikon Administration for all students who participated in this study.

e. Questionnaires were used to get input from students with regard to the Language Development Programme.

1.5.3 Data-collection plan

A tabulated data-collection plan, similar in layout to the one used by Mukhari (1994:5), appears below. Ticks in the appropriate columns indicate which data-collection method applies to which research question.

Table 1: Data-collection plan used in this study

NOTE: EG =Experimental Group;
CG = Control Group

Research questions	Data-collection method							
	Pre-test		Post-test		Academic progress reports		Questionnaires	
	EG	CG	EG	CG	EG	CG	EG	CG
1. How does the reading performance of first-year ESL students at the Border Technikon compare with the national average obtained by senior secondary school pupils over all SA population groups?	✓	✓						
2. Are the marks obtained by these students in their respective courses related to their reading performance?	✓	✓			✓	✓	✓	
3. Do students show any improvement in reading performance after attending the reading laboratory for six months?	✓	✓	✓	✓			✓	

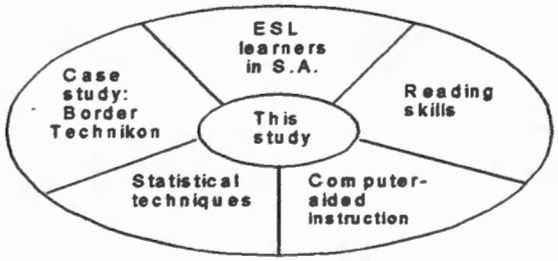
1.6 Basic assumption underlying the study

Although language proficiency calls for fluency in all four basic language modes, of which reading is one, this study regards the reading performance of a student to be representative of his or her language proficiency in general. This premise is supported by second-language researchers such as Eskey (1987:86) and Devine (1987:83), both of whom claim that a positive relationship exists between a reader's general proficiency in a language and his or her ability to read well in that language.

1.7 Overview of the study

The position of this study relative to its fields of interest is graphically depicted in figure 1 below:

FIGURE 1: FIELDS OF INTEREST TO THIS STUDY



1.8 Outline of the study

Chapter 1: Contextualization and background, problem statement and purpose of the study.

Chapter 2: Review of literature on reading performance.

Chapter 3: Review of literature on computer-aided instruction.

Chapter 4: Research methodology.

Chapter 5: Findings of the study.

Chapter 6: Conclusions and recommendations.

Chapter 2
READING PERFORMANCE

2.1 Introduction

The aim of this chapter is to explore different aspects of student reading performance within a South African context. Of particular importance to this study is to focus on those aspects that have been identified in recent years as problem areas at other educational institutions, especially the so-called historically disadvantaged institutions.

2.2 Reading performance of ESL learners

In a comparison of the reading skills of mother tongue learners and non-mother tongue learners, De Witt *et al.* (1998:118-123) found significant differences between the two groups. With regard to reading speed, reading accuracy and reading comprehension, mother tongue learners convincingly outperformed non-mother tongue learners. Furthermore, non-mother tongue learners were reading at a level below their chronological age, whereas mother tongue learners showed no discrepancy between reading age and chronological age.

However, this research was based on the reading performance of a group of eight-year olds, who were obviously still novice readers. One could argue that these scholars were still far from being fluent in the art of reading, and that their reading habits and styles had probably not been established yet. More pertinent, though, at the age of eight most scholars who receive education in a language other than their mother tongue would probably not have been exposed to the second language for more than a year or two.

The question now arises as to whether the results obtained by De Witt *et al.* would be replicated if subsequent tests were to be conducted on mother-tongue learners and non-mother tongue learners in a secondary-school environment or even in a tertiary setting, when the students would have been exposed to the second language for much longer. Would the differences between the two groups not gradually diminish over the years as non-mother tongue learners become more proficient both in the second language and in reading? This does not seem to be the case. Indications from research are that shortfalls in reading skills can be a handicap that worsens with age unless the underlying reading problems are corrected at an early stage (Coetzee, 1993:106; Clay, 1987, cited in Denti & Guerin, 1999). Grossen (1996) corroborates this view, namely that a poor start in reading can result in an ever-widening gap between those who read well and those who do not. Stanovich (1986:394) uses the term "Matthew Effects", derived from Matthew according to the Gospel, who said that the rich would get richer and the poor poorer, to explain why, specifically in reading, the gap between slow starters and fast starters often becomes progressively larger.

One of the possible reasons why struggling non-mother tongue readers might fall even further behind is because the language they encounter in higher-grade texts makes much greater cognitive demands on them. Cummins (1992:16) makes the distinction between two levels of language proficiency, namely basic interpersonal communicative skills (BICS) and cognitive/academic language proficiency (CALP). The former refers to the basic language skills ESL learners need for conversational proficiency, and the latter refers to the more advanced language skills needed in a cognitively demanding and context-reduced academic context. The two terms "cognitively demanding" and "context-reduced" can be explained in terms of two dimensions of language proficiency, as proposed by Cummins (1992:18),

which underlie the linguistic skills required of ESL learners. The first dimension concerns the range of contextual cues available to assist comprehension. These cues range from "context-embedded" on the one extreme to "context-reduced" on the other. In context-embedded communication the receiver of a message can rely heavily on non-verbal signals and other situational cues to construct meaning. In context-reduced communication the receiver has to rely solely on linguistic cues to interpret the message. The second dimension concerns the complexity of the communicative task. In cognitively undemanding tasks the necessary linguistic skills have been mastered to the extent that relevant tasks can be performed with little cognitive effort. Cognitively demanding tasks, on the other hand, require active employment of cognitive strategies. ESL learners may therefore appear to be reasonably fluent in English, judging by their BICS type skills, but they may encounter serious problems at the tertiary level when confronted with texts of an academic nature, because of underdeveloped CALP skills.

Cummins's (1992) theory of a Common Underlying Proficiency (CUP) provides a possible framework for understanding the plight of the Black tertiary student in South Africa. According to Cummins (1992:22), one's mother tongue provides the conceptual and academic foundation for the acquisition of second-language skills. Transfer of literacy-related skills, such as reading strategies and cognitive or academic skills can take place from L1 to L2, provided that there is sufficient exposure to the second language in the immediate environment, and that there is sufficient motivation to learn.

One of the implications of the CUP theory is that a sound L1 foundation is needed for effective transfer to take place. From the poor academic performance of Black students at the tertiary level it would appear that their

impoverished schooling did not provide them with a sound foundation on which to build L2 skills. It transpires, then, that historically disadvantaged students are handicapped in more ways than one. They have to understand cognitively demanding text, written in a language that is not their mother tongue, by relying exclusively on knowledge of that language itself for interpretation of the text. At the same time they also have to overcome serious shortfalls in their own conceptual and academic L1 development through the medium of English.

In the last decade, a large number of researchers have directed their attention to the poor English reading skills of tertiary students, particularly at historically disadvantaged institutions (Saunders, 1991:14; Olivier, 1998:57; Fletcher, 1993:126; Perkins, 1991:231; Swiegers & Rheeder, 1995:165). For example, Saunders (1991:14) states that a survey carried out at teachers' training colleges in the former Bophuthatswana showed that the average reading age in English of incoming students was equivalent to that of the average English mother-tongue speaker halfway through Grade 3. Such findings are indeed cause for concern.

2.3 ESL learners' use of textbooks

Numerous researchers have also commented that textbooks seem to present a problem to second-language learners. For instance, Perkins (1991:232) reports that a study conducted at Unitra found that only 13,8% of the first-year students had the reading skills necessary to cope with their textbooks. In a comparison of the academic skills of educationally advantaged students with those of disadvantaged chemistry students at Vista University, Swiegers and Rheeder (1995:165) found that disadvantaged students tended to avoid textbooks, opting instead for some sort of verbal communication (e.g. class

lectures or discussions with friends). Olivier (1998:57) reports that students coming from an ex-DET background often find recommended books too difficult to work through without assistance. Jiya (1993:80), reporting on the language difficulties of black BSc students at the University of Fort Hare, also confirms that most ESL students experience serious problems in understanding their textbooks. The above studies all indicate that many ESL students, especially those at historically disadvantaged institutions, struggle to cope with textbooks prescribed at the tertiary level.

Students who fail to grasp some or all of the content of a lecture are therefore likely to find themselves in a predicament: Theoretically they should be able to resort to their textbooks for clarification of concepts not understood during a lecture. But what should they do when they also fail to understand their textbooks? Olivier (1998:57) warns that such students have "very little to fall back on, except perhaps rote learning and plagiarism".

2.4 ESL learners' reading habits

It is a well-documented fact that the culture of reading is not well-entrenched in African communities (Macdonald, 1990:101; Mawasha *et al.*, 1994:35; Fletcher, 1993:89; Saunders, 1991:14; Viljoen, 1987:103; Cronje, 1997:3). Dison (1997:36) provides a number of reasons for this, such as the oral traditions of African people, poverty and a history of educational disadvantage. Viljoen (1987:103) ascribes the poor reading habits of disadvantaged communities to a shortage of books at home, the absence of a reading culture, inaccessibility of public library facilities (e.g. not within walking distance), a shortage of relevant reading materials written in the vernacular, and failure to view reading as an enjoyable pastime.

Mawasha *et al.* (1994:35) are of the opinion that tertiary students should be consulted in the acquisition of library books to avoid the risk of acquiring inappropriate or irrelevant books that are of no interest to students.

Fletcher (1993:89) stresses that students who do not regularly hear English outside school ought to read English literature to keep in contact with the language. Yet few African students seem to read during their leisure hours. In a study conducted at the University of the North and at four colleges of education in the former Northern Transvaal, only 5% of the 238 respondents considered reading to be an enjoyable exercise (Mawasha *et al.*, 1994:34).

Saunders (1991:14) highlights the importance of reading for pleasure. He stresses that true education comes from knowledge derived from books, and not only from what the lecturer says in class. Unless students are taught the art of reading, they will still only read under compulsion by the time they graduate. According to Saunders, the system will perpetuate itself in that non-reading students who enter the teaching profession after graduation will not be able to instil a love of reading in their own students one day. Eskey (1987:191) argues that the ultimate aim of any kind of reading instruction should be to turn students into lifelong readers.

2.5 Specific aspects of reading performance

2.5.1 Reading speed

Fletcher (1993:126) observed that some students at a traditionally black rural college of education were writing extremely slowly when copying notes from the board. These students copied only one or two words at a time, and then had to search for the right place on the board where they had stopped

previously. Fletcher ascribes this phenomenon to students' limited reading ability, suggesting that they read only one or two words at a time instead of reading words in meaningful clusters. Reading word-for-word is generally declared to have a detrimental effect on overall reading speed (compare Murray & Johanson, 1992:34; Bouwer, 1989:54).

Reading speed can also be slowed by bad reading habits. I have personally observed that many students at Border Technikon have bad reading habits, such as vocalization (reading out loud) and subvocalization (mouthing of the words), that are slowing them down. Judging from the noise levels in the reading laboratory when the students were supposed to do "silent" reading, it was evident that many of them were actually saying the words out loud. It is generally accepted that vocalization and subvocalization limit reading speed considerably (Strauss, 1992:87; Fry, 1994:25).

Researchers have not yet reached consensus as to how fast students should read to attain a functional reading speed. Coetzee (1993:113) quotes several reading rates, ranging from 125 words per minute to 400 words per minute, that have been proposed by various authors as being an adequate reading speed for secondary-school learners.

The lack of universally accepted norms for the assessment of reading speed causes much confusion. The use of reading rate as a factor in assessing overall reading performance therefore becomes problematic.

Carver (1989:161) attempted to overcome this problem by converting silent reading rates into grade equivalent units. There seem to be two prerequisites for using Carver's method to evaluate reading speed: Firstly, the reading rate has to be measured in, or converted into, standard length words (consisting of

six character-spaces) per minute. Secondly, the text chosen has to represent a level of difficulty appropriate for the grade level. A closer look at Carver's scales reveals that a reading rate of 256-270 standard length words per minute (250 standard length words being equivalent to 248 actual words per minute) corresponds with a grade equivalent of 13. In terms of Carver's grade equivalents, first-year students at the tertiary level should therefore be reading at a minimum rate of 248 actual words per minute. A similar value is given by Aboagye (1997:65), who sets a minimum rate of 250 words per minute as objective for first-year secretarial students at the Border Technikon after completion of the Language Laboratory course.

Having witnessed the computer-generated reading results of first-year students at the Border Technikon over a number of years, I believe that very few of these students are actually able to read a grade-appropriate text at this rate. Reading rates of less than 115 words per minute, which translate into a grade equivalent of 2 according to Carver's scales, are not uncommon. However, at this point it would be appropriate to add that some research findings have shown that reading from a computer display may be up to 25% slower than reading from a printed copy (Duffy & Roehler, 1989:408). Nevertheless, the fact remains that many students at Border Technikon are reading at a speed that does not bode well for their academic careers. This is especially the case when one considers that researchers generally agree that reading speed correlates strongly with comprehension (Williams & Snipper, 1990:23).

2.5.2 The relationship between vocabulary and reading comprehension

When individuals do not read a great deal, their vocabulary development will suffer accordingly (Stanovich, 1992:329). A limited vocabulary, in turn, will

affect the ease with which readers are able to understand a text. According to Cooper (1997:98), the ease with which a reader is able to make sense of a text will be influenced directly by the number of words that he or she knows. The smaller the vocabulary size, the more difficult it is to construct meaning from print. Vocabulary limitations will also impact negatively on overall reading speed. It is therefore clear that the consequences of insufficient reading practice (e.g. insufficient vocabulary development) will be detrimental to the reading process itself and will manifest in reading comprehension difficulties and a slow reading speed.

Although there seems to be general consensus among researchers that an adequate vocabulary is fundamental to good reading comprehension, researchers are still not in agreement as to how many words a reader should know to be able to read academic texts (Cooper, 1997:98).

To return once more to Cummins's BICS/CALP distinction: A number of researchers and theorists, for example Kilfoil (1997:181), have pointed out that language proficiency involves not only two but at least three aspects, namely ordinary competence (BICS), cognitive academic language proficiency (CALP), and discipline-specific language proficiency. This implies that, in an academic context, ESL learners do not only have to meet general academic literacy requirements, but also have to meet the discipline-specific linguistic demands that some subjects, such as science, economics and mathematics, make on them. Jiya (1993:80), in referring to the language difficulties of students in the science courses at the University of Fort Hare, stresses that specific disciplines, such as natural science, call for the development of a highly specialized literacy. Problems in developing an understanding of the discourse of a particular discipline can be exacerbated by the fact that students sometimes have to acquire new meanings for everyday words (Jiya,

1993:80; Paxton, 1998:145) or have to come to grips with highly abstract language (Paxton, 1998:143-145).

From the above it would appear that students enrolled for courses requiring in-depth knowledge of particular disciplines also need to develop a specialized vocabulary, in addition to a general academic literacy, to cope with the specific demands of their courses. Limitations in this regard will obviously also affect students' reading comprehension.

2.5.3 Attribution of meaning

In terms of schema theory, which underlies the most widely held current view of the reading process, reading is regarded as an interactive process between the reader and the text. Meaning is constructed as a result of interaction between the reader's background knowledge and the information given in the text. The ability to understand a text largely depends on the reader's ability to access background information, i.e. to activate background schemata, about the facts presented in the text. Prior knowledge therefore serves as scaffolding to aid the reader in decoding the writer's message. New content has to be integrated meaningfully with existing schemata. Instead of regarding reading as a linear process whereby words simply have to be decoded, the schematic theoretic view of reading suggests that comprehension depends on achieving a match between the mental images of both the reader and the writer (Williams & Snipper, 1990:13). If no match is possible, comprehension will not take place.

It stands to reason that ESL readers would be in a much better position to understand a text when it deals with aspects familiar to them or related to their culture, i.e. for which they can activate the appropriate schemata. Yule

(1996:87) cautions, however, that cultural schemata may sometimes give rise to misinterpretations when different cultures attach different meanings to concepts: "Something good in one person's schema can sound like something bad in another's". Parry (1987:62) points out that ESL readers whose cultural background differs vastly from that of the writer of the text are unlikely to have the appropriate schemata for understanding the message conveyed by the text. Lack of familiarity with the cultural content of the text is likely to lead to comprehension difficulties. Miller *et al.* (1998) specifically refer to the South African situation by stating that the background schemata of under-prepared students, who are predominantly from an African culture, do not have a facilitating effect on the comprehension of textual materials rooted in a Western culture. Kilfoil (1997:180) believes that this disparity between African students' frames of reference and the Western philosophy underlying academic discourses at South African universities has an "alienating" effect on students, which effectively excludes them "from all but superficial rote-learning".

Even if readers do have the appropriate background schemata, whether cultural or otherwise, it does not necessarily guarantee that they will be able to interpret the text correctly. Pillay (1988:30) contends that second-language readers often do not use background information effectively, even when this is explicitly provided in the text. It seems that reading in the second language sometimes requires so much effort in terms of linguistic processing, that active employment of first language reading strategies is forgotten.

To interpret a text correctly, readers need to understand the different meanings that are conveyed. Pillay (1988:32-34) distinguishes between four different kinds of meaning that every sentence in a text is supposed to have, namely conceptual meaning, propositional meaning, contextual meaning and

pragmatic meaning. Although one meaning might sometimes take precedence, the reader has to be able to understand every sentence in the text, as well as the relation between sentences, in these four different ways.

My own experience at the Border Technikon has shown that students encounter difficulties with at least some of the meanings a text can have. For instance, they often fail to understand expressions intended to be humorous or sarcastic. They also find it difficult to "read between the lines", taking every word at face value instead. The reason for this probably lies in a cultural outlook that differs vastly from that of the writer of the text.

In view of the above, it is not surprising that many students do not derive any pleasure from reading. It is therefore all the more important that libraries keep a variety of books written in a style that Black students can relate to from their own cultural perspective.

2.6 The relationship between reading and cognitive skills

Reading contributes to vocabulary development (see subsection 2.5.2) and the development of general language skills (Share & Silva, 1987:224; Stanovich, 1992:329). Reading also leads to the acquisition of knowledge. The more one reads, the better one's general knowledge would be (Stanovich, 1993:170). The knowledge base of a struggling reader who avoids reading-related activities is probably less developed than that of an avid reader who often becomes cognitively involved with reading matter. Stanovich (1988: 162; 1992:329) argues that initial reading deficits rapidly broaden into more generalized deficits, to the extent that even the development of higher cognitive skills is affected.

The consequences of a lack of reading experience from an early age may not be easily remedied. Even if a student's imperfect reading skills could be improved at a later stage, the profound cognitive consequences of years of insufficient reading would remain.

By implication, it could hardly be expected of any reading enrichment programme to improve students' reading, language and cognitive skills within a relatively short period of time. Such programmes would probably have to be used extensively over a considerable period of time.

2.7 Reading performance as a predictor of academic achievement

Academic achievement can be influenced by a multitude of factors, of which motivation to learn, cognitive ability and subject matter knowledge are but three obvious examples. These factors will, of course, vary from individual to individual.

Even though it would probably be impossible to single out any one factor as the prime causal factor of poor academic achievement, one should attempt to isolate specific factors which seem to play a dominant role in preventing students from realizing their full academic potential. For this reason, researchers and educators have long been interested in the relationship between language proficiency and academic achievement. Especially in the case of second-language learners, or more specifically in a South African context, in the case of disadvantaged students whose proficiency in the language of instruction is suspect, it becomes of paramount importance to establish the exact nature of this relationship.

The fact that many tertiary institutions have instituted language development or support programmes (see Kilfoil, 1997:179-180) seems to suggest an underlying assumption that language proficiency is a determining factor with regard to academic achievement. The extent to which proficiency in the language of instruction affects academic progress is, however, still a contentious issue. As indicated in chapter 1, the controversy surrounding the relationship between language proficiency and academic achievement involves at least three different views:

a) Kokong (1991:78), as representative of the first view, holds reading ability in English as a second language to be closely related to academic achievement in subjects such as English, Biology and History at matric level. Kokong (1991:80) argues that students' academic results can be improved by improving their reading ability in English. Kokong's research findings are similar to those of researchers such as Mawasha (1976, cited in Kokong, 1991:2), who found that the reading ability and scholastic achievement of students in Gazankulu were closely related.

b) In sharp contrast to Kokong (1991), Court (1988:160) declares that in heterogeneous student populations, where many students come from disadvantaged backgrounds, language proficiency is not a reliable predictor of academic success. She reports that the academic results of Black students who performed poorly in the language screening test administered by the University of Durban-Westville in 1986 and 1987 exceeded all expectations in the English I course in both years. The predictive value of the language test, which had produced satisfactory results up to 1985, proved to be unsatisfactory in the new dispensation when large numbers of Black students from disadvantaged backgrounds enrolled at the university. Court (1988:161) consequently

cautions against the practice of admitting students to academic institutions on the basis of their performance in any particular language test.

c) In an American study, Royer *et al.* (1987:19) found that subject-related reading comprehension showed a strong correlation with students' learning performance in that specific subject (Educational Psychology and Business Statistics), but, interestingly enough, not with the average for all subjects taken in the course (what the Americans call "grade point average" or "GPA"). Royer *et al.* therefore suggest that a general reading comprehension test could serve as a predictor of general learning performance, whereas a content-specific comprehension test could be a predictor of learning performance in a specific course of study. They recommend that any language test used for the screening of candidates should include both a general comprehension section and a subject- or course-specific section, which together would give a more reliable indication of the candidates' learning potential.

- It must be borne in mind, however, that the test subjects of this American study were mother-tongue speakers of English, whereas the majority of students at historically disadvantaged institutions in South Africa are second-language speakers of English. This might be of consequence in an extrapolation of the findings to the South African situation.

From the above discussion one can conclude that the relationship between language proficiency and academic achievement is still controversial. This investigation hopes to make a contribution in this regard by adding new information to the total body of evidence that is available at present.

2.8 Conclusion

In the South African context, there seems to be agreement among researchers that ESL students' poor command of English often leads to rote learning when language problems become too great. It also appears that many ESL learners struggle to cope with their textbooks without assistance. In general, ESL students' reading ability in the language of instruction seems to pose a major problem at the tertiary level.

The reading problems that ESL learners experience in an academic context seem to be mainly related to the following:

- Low proficiency in English
- Insufficient background knowledge
- The use of inappropriate reading strategies
- Limited vocabulary
- Cultural differences
- Poor L1 foundation
- Insufficient reading practice.

Researchers differ in opinion about the relationship between reading ability and academic success. Proof of a positive correlation between reading ability in English as a second language and academic success was reported by some investigations, but refuted by others.

Chapter 3
COMPUTER-AIDED INSTRUCTION (CAI)

3.1 Introduction

The nature of this study necessitated the inclusion of a chapter on computer-aided instruction (CAI), sometimes also referred to as computer-assisted instruction or computer-based instruction. The aim of this chapter is not to provide an exhaustive review of possible applications of computers as teaching tools, but rather to provide a broad overview of recent research findings with regard to the effectiveness of computer-aided reading instruction. Special attention is paid to research studies comparing computer-aided reading instruction with text-based reading instruction. Although possible computer applications for literacy instruction are generally understood to include aspects such as word processing, e-mail, use of multimedia, use of the Internet, and even discussion of topics via chat rooms and user groups, this chapter focuses primarily on the use of dedicated software aimed at improving reading performance.

3.2 The relationship between technology and literacy

According to Labbo and Reinking (1999:2) the linguistic concept of deixis can be used to describe the relationship between technology and literacy. Deixis refers to those language terms that undergo a swift meaning change in relation to a changing point of reference. The extremely rapid advances made in computer technology bring about continual changes in the implications for the use of this type of technology in classrooms. This of course also implies that research focusing on the applications of computers in an educational environment may become outdated or irrelevant in a relatively short time.

3.3 Advantages of CAI

Researchers have offered the following advantages of CAI over other modes of instruction:

- Immediate feedback (Labbo & Reinking, 1999:8; Hardisty & Windeatt, 1989:8; Clark & Starr, 1991:391; Mostert, 1995:191).
- Individualized instruction, with students progressing at their own rates (Clark & Starr, 1991:398; Labbo & Reinking, 1999:8; Mostert, 1995:191). This may be especially helpful in the case of disadvantaged communities, where the teacher : student ratio is often very high (Roos, 1993:152).
- A shift from teacher-centred instruction to student-centred instruction (Labbo & Reinking, 1999:9; Clark & Starr, 1991:391).
- An interesting alternative to traditional paper-based instruction, resulting in improved student attention and motivation (Clark & Starr, 1991:390).
- A safe, non-threatening learning environment, with the computer being the ever-patient tutor (Mostert, 1995:191).
- Automatic test scoring and results analysis (Clark & Starr, 1991:398).
- Automatic record-keeping facilities that allow the instructor to keep track of students' progress on the computer (Clark & Starr, 1991:398).
- Helpful in developing thinking and problem-solving skills (Clark & Starr, 1991:392).
- Opportunity for the teacher to give more attention to individual students (Hardisty & Windeatt, 1989:9).
- Promotion of accuracy in language use because students have to type in the exact words that the computer has been programmed to accept (Hardisty & Windeatt, 1989:10).

- Enrichment of reading materials through the addition of digitized sound and graphics (Mostert, 1995:191).
- Different levels of difficulty to meet individual needs (Mostert, 1995:189).
- Preparation of students for "the literacy of the future" (Labbo & Reinking, 1999:11).

3.4 Disadvantages of CAI

The main disadvantages of computer-aided instruction seem to revolve around the following:

- The cost of implementation is very high (Roos, 1993:152).
- It is not always easy to find the correct software (Roos, 1993:152). Overseas courseware is often not suitable, as pointed out by Andrews (1995:7). Spelling and semantic differences between American/British programs may be confusing to South African students. Measurement units such as pounds, dollars, gallons or inches are incomprehensible to most of these students. Furthermore, because of fundamental cultural differences, South African students may find some of the content of overseas courseware difficult to understand, for example reading materials dealing with topics such as Halloween or Thanksgiving, etc.
- In my opinion, an inherent disadvantage of computer-aided reading instruction is that basic computer, mouse and keyboard skills need to be taught to students before they can start using the reading program. A considerable investment of time may be required to develop students' computer skills to the extent that the reading software can be used effectively. Progress may be extremely slow, especially when dealing with students from disadvantaged communities, who have had no previous

exposure to computer technology. Large classes and relatively short working sessions may further exacerbate the problem. So may a complicated network log-in procedure, as was the case in this study. Although a basic computer literacy would undeniably stand students in good stead in their future working careers and could definitely not be considered a waste of time, the fundamental issue is that the main objective – improving students' reading skills – has to take a backseat for a while until the students have acquired the necessary computer skills.

3.5 Overview of research findings

3.5.1 Effectiveness of computer-aided instruction

The results of a methodical analysis of the literature on CAI in reading reveal that there has been a gradual shift in emphasis over the years. While the initial focus was on creating a general awareness of the need for computers in the classroom and exploring possible applications of computers as educational tools, more recent studies express concern as to whether computer-based education truly improves students' capabilities in measurable terms.

The overwhelming majority of researchers in the field of computer-aided reading instruction are of the opinion that CAI does indeed lead to an improvement in students' reading performance. Mukhari (1994), for instance, assessed the impact of a locally developed computer-supported language program on the reading comprehension of a group of grade 7 learners, and found that their comprehension could be significantly improved over the course of ten weeks. She concluded that computer-based programs can be an effective means of improving and developing the literacy skills of readers,

especially as far as vocabulary development and reading comprehension are concerned. Research conducted by Jones *et al.* (1987:126) focused on the impact of CAI on a different set of reading skills, i.e. decoding fluency. The results revealed that daily computer-mediated reading practice over a period of 10 weeks brought about significant improvements in the decoding speed and accuracy of a group of reading disabled students.

Some investigators have explored the question of effectiveness by comparing the results yielded by computer-aided reading instruction with those produced by print-based instruction. A review of the comparative literature on computer-aided reading instruction vs. text-based instruction reveals two distinct viewpoints: Some studies indicate that computer-aided instruction yields results superior to text-based instruction, while others suggest that computer-aided instruction and text-based instruction yield similar results.

Andrews (1995:7), as one of the protagonists of computer-based instruction, claims that the efficiency factor of computer instruction is four times greater than that of traditional educational methods, and that this technology offers a 40%-60% accelerated learning rate. Cotton (2000:5) offers findings from a number of research studies as evidence that the use of CAI enhances both learning rate and retention of learning. Students not only learn better and faster with CAI than with conventional instruction alone, they apparently also retain the content of what they have learned better.

Kuehner (1999:168), on the other hand, having investigated the effects of both a commercial computer-based program and a similar text-based program on a group of college students, found no significant difference between the reading performance of students who used the computer-based reading program and students who used the text-based version over a period

of ten weeks. Both programs produced equivalent results. Similarly, Peterson *et al.* (1999:1), who also investigated the effectiveness of a computer-based reading program and a similar text-based program among college students, found no significant difference in the reading comprehension of students who practiced on the computer and students who worked with text-based materials over the course of one semester. Once again equivalent results were obtained with both methods of instruction. These research findings are consistent with the earlier findings of Reinking (1988:495), who found no significant difference in the reading comprehension of students who read conventionally printed texts and students who read the same passages displayed on a computer screen.

From the above, it is clear that empirical evidence of the effectiveness of computer-aided reading instruction abounds, although the superiority of CAI to traditional modes of instruction has not been proven beyond any reasonable degree of doubt.

By evaluating the impact of the computer-based Language Development Programme on the reading performance of first-year Border Technikon students, this study hopes to contribute further information to the empirical body of evidence that is available at present.

3.6 Conclusion

Although the potential of computers for improving reading proficiency is widely acknowledged, research has shown that computer-aided reading instruction does not always meet performance expectations. Neither does it necessarily yield results superior to text-based instruction. In fact, a number of investigators have demonstrated that computer-aided instruction offers no

significant advantage over text-based instruction as far as reading performance is concerned.

Chapter 4
RESEARCH METHODOLOGY

4.1 Introduction

The aims of this chapter are:

- to describe the participants in the study and to explain how they were selected;
- to explain what type of information was collected and how and when it was done; and
- to indicate which statistical data analyses were performed.

4.2 Research sample

As mentioned in chapter 1, the target population consisted of 1680 first-year ESL students at the Border Technikon. Unfortunately it was not possible to select a random sample from the target population. Having been a lecturer at the Border Technikon at the time, I had to use students to whom I had access on a regular basis. Practical reasons therefore determined that a purposive, non-random method of sampling be used. Because there was no randomisation of groups, this study is not truly experimental in nature. Instead, because the research subjects were students from naturally occurring, intact class groups, it can be regarded as quasi-experimental in nature. According to Brown (1991:155) "naturally occurring group designs, sometimes called quasi-experimental designs, are similar to the experimental/control group approach except that they make comparisons between the mean performances of groups that occur normally."

Since I regularly lectured five groups of first-year students in a range of communication skills courses, I decided to include all of them in the sample group that was used for this investigation. The five groups involved were Marketing, Human Resources Management, Analytical Chemistry, Fashion, and Management. The basic structure of the five groups was kept intact, i.e. the sub-samples were not manipulated in any way. However, students who had failed to write either the reading performance pre-test or the post-test were removed from the database. So were students whose student numbers did not start with the digits "99". This step was taken to ensure that only first-year students were tested and that no students had been exposed to the reading programme previously.

The sample group was then sub-divided into an experimental group and a control group, based on whether or not students' respective courses required them to attend the reading laboratory. The experimental group, consisting of 100 Marketing, Human Resources Management and Analytical Chemistry students, attended the reading laboratory once per week for sessions of 45 minutes each, where students worked on a specialized reading programme aimed at improving their language skills. The control group, consisting of 56 Fashion and Management students, received no such support during their courses.

Altogether 156 students were tested. The structure of the sample group in terms of sex was as follows: 50 males and 106 females. The average age of the sample group was 20. Students all spoke Xhosa as their home language.

4. 3 Data collection

4.3.1 Reading performance tests

At the beginning of the 1999 academic year, i.e. in February, the reading proficiency of the sample group was assessed by means of a standardized reading performance test developed by the Human Sciences Research Council, namely the Reading Performance Test in English for the Advanced Level: Standards 8, 9 and 10 (1996). This test was used to determine "the reading performance levels of English Language (first and second language) within the range of Senior Secondary performance levels (i.e. Standards 8, 9 and 10)" (Van Heerden, 1996:24). The test format was that of a booklet, which contained a total of 50 multiple-choice questions. Instructions supplied with the test were closely adhered to. The test was administered in a quiet, well-lit classroom and took 60 minutes to complete. Students who finished early had to remain seated until the end of the test. Students answered the questions on an answer sheet provided by the lecturer. The answer sheets were then collected and carefully scored by hand with a scoring stencil. Unfortunately a copy of the test could not be included in this study because of a clause prohibiting the reproduction of any part of the text.

Students were informed of the outcome of the reading performance test. From an educator's perspective, it was considered necessary to inform students who did not perform well in the test that extra effort on their part would probably be required during the course of the year if they wanted to achieve academic success.

A lecture on the benefits of the reading programme was subsequently given to those students who had to attend the reading laboratory. The purpose of

this lecture was two-fold: Firstly, to generate enthusiasm for the reading course. Secondly, to help students identify and avoid bad reading habits, such as vocalization and subvocalization, which they might have developed over the years. Whenever students were observed to be vocalizing or subvocalizing in the reading laboratory, this was immediately pointed out to them.

At the end of February, soon after the students had written the first HSRC Reading Performance Test, major student disruptions at Border Technikon brought lectures to a halt for a period of four and a half weeks. Although lectures officially started again on 24 March, students were returning slowly over the next couple of weeks. Low morale and poor attendance figures generally put a damper on spirits when students were finally introduced to the reading laboratory. Because of a difficult log-in procedure and networking problems, coupled with the fact that students did not all return at the same time and instructions consequently had to be repeated over and over again whenever new students arrived, another few weeks were lost before the students were all familiar with the procedure. It was well after the Easter break that students could start using the reading programme in earnest. Some students attended very erratically, probably because no course credits were obtained for regular attendance and because they did not really understand why they had to attend in the first place. Others were extremely keen to participate in the project, to the extent that they often repeatedly had to be requested to log off so that the next class could start on time. It is against this backdrop that the effectiveness of the reading laboratory over a 6-month period had to be evaluated. Although a period of six months elapsed between the two reading performance tests, students effectively spent three or four months only on the programme before their progress was measured.

Early in September, the HSRC Reading Performance Test was once again administered to the same five groups of students originally tested. The results of the second test made it possible to determine whether any improvement in general reading performance had taken place over the preceding six months. English reading instruction over a period of six months was therefore taken as the independent variable, the dependent variable being the changes in students' overall reading performance in English that resulted from this exposure.

4.3.2 Questionnaires

In May, all students were requested to complete a questionnaire aimed at eliciting some basic information from them, such as their age, their matriculation symbols for English, and whether they were experiencing any problems with their textbooks. A copy of the questionnaire has been included in Appendix A to the study.

Towards the end of September, students who participated in the reading programme were requested to complete a second questionnaire handed out to them in class. Students were encouraged to be completely truthful in answering the questions, and were given the reassurance that their responses would be treated confidentially. The purpose of the questionnaire was to assess students' attitudes towards the reading programme. They were also asked whether the reading laboratory, in their opinion, had had any positive effect on their general English language skills. Recommendations for improvement were invited from the students. A copy of this questionnaire appears in Appendix B to this study.

4.3.3 Academic progress reports

At the end of the academic year, in December, a computer printout of students' final marks in all subjects was obtained from the Border Technikon Administration. Three sets of marks, per subject, were available for each student: The year mark calculated in October, the examination mark obtained in November, and the combined mark to be entered on students' progress reports in January the following year. Although the original intention was to use students' combined marks for the purposes of this study, this posed to be a problem: Many students enrolled for five subjects at the beginning of the year but only managed to write the final examination in two or three of them. A possible reason for this phenomenon could very well be that some students did not manage all their course work before the November examinations, and that they therefore concentrated on obtaining better marks in fewer subjects. Still, to calculate an average mark for these students was problematic. Basing the average mark on two on three subjects only would not account for the fact that the students actually failed to write the other subjects. The decision was therefore made that the average mark to be calculated over all subjects for each student would be based on their year marks only, i.e. the marks they obtained in each subject during the course of the year, without having written the final examination. The course average was then used to ascertain whether there was any correlation between students' general reading performance and their overall academic achievement.

4.4 Data analyses

All statistical analyses of the collected data were performed by STATKON, the Statistical Consultation Service of the Rand Afrikaans University, using the Statistical Package for Social Sciences (SPSS).

Three main sets of data analyses were performed: The first set of analyses involved determining the percentage of students with reading deficiencies. For the second set of analyses correlations were calculated to determine the relationship between the reading performance and the academic achievement of students. T-tests were used for the third set of analyses, i.e. to determine whether there was any significant improvement in the reading performance of students who participated in the reading programme. Results are discussed in the next chapter.

4.5 Conclusion

In this chapter the research subjects, methods of data collection, and main sets of data analyses were described with a view to ensuring replicability of the study and facilitating an understanding of the findings discussed in the next chapter.

Chapter 5
FINDINGS

5.1 Introduction

This chapter is divided into two main sections, i.e. "Quantitative research results" and "Qualitative research results".

The first section attempts to answer the questions posed in section 1:

- To which extent are the reading skills of first-year ESL students at the Border Technikon deficient, if at all?
- Do inadequate reading skills contribute to poor academic performance at the Border Technikon?
- Do first-year ESL students at the Border Technikon benefit from regular attendance of the reading laboratory?

The second section summarizes the data collected by means of questionnaires in order to present the views of students who participated in the Language Development Programme at the Border Technikon. The aim of the two questionnaires was mainly to establish whether students were experiencing any difficulties in understanding their textbooks, to determine students' attitudes towards the reading laboratory, to find out whether they believed that their English language skills had improved as a result of regular reading practice on the computer, and to invite specific recommendations for improvement from them.

5.2 Interpretation of quantitative research results

5.2.1 Percentage of first-year Border Technikon students with reading deficiencies

The purpose here was to determine how the reading performance of first-year ESL students at the Border Technikon compares with the national average obtained by senior secondary pupils (Standards 8, 9 and 10) over all SA population groups. For the purpose of this study, students having scores below stanine 5 on the standardized HSRC reading performance test are deemed to have reading deficiencies. In other words, students with a below average score are regarded as poor readers. Good or average readers are defined as having scores equal to or higher than stanine 5. Table 2 summarizes students' reading performance scores in stanines.

TABLE 2: DISTRIBUTION OF PRE-TEST STANINE SCORES (EXPERIMENTAL AND CONTROL GROUPS COMBINED)

Stanine	Frequency	Cumulative percent
2	5	3.2
3	27	20.5
4	40	46.2
5	38	70.5
6	27	87.8
7	12	95.5
8	6	99.4
9	1	100.0
Total	156	

A very wide range of English reading proficiency levels is noticeable within the group, with results ranging from stanine 2 (the lowest score) to stanine 9 (the highest score). It can be seen from Table 2 that 46,2% of the students

scored below stanine 5 at the beginning of the 1999 academic year. This means that the reading performance of almost half of the first-year Border Technikon students tested can be regarded as poor in relation to the achievement of a national sample of Standard 8, 9 and 10 pupils.

5.2.2 Relationship between reading proficiency and academic achievement

The intent was to determine if reading proficiency would be a significant predictor of academic performance. For the purpose of this analysis, the Pearson product-moment correlation coefficient was calculated between the two variables and a two-tailed test for significance was performed at an alpha level of 0,01. Results are given in Table 3 below.

TABLE 3: CORRELATION BETWEEN PRE-TEST / POST-TEST STANINE SCORES AND YEAR MARKS

	Pearson correlation	p-value	N
Pre-Test Stanine Scores	0,270	0,001	156
Post-Test Stanine Scores	0,278	0,000	156

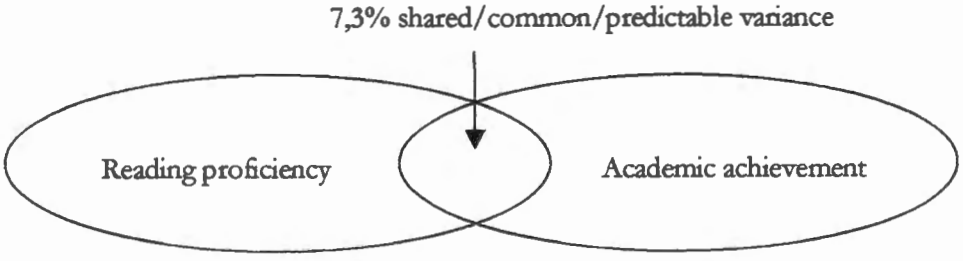
A significant positive correlation ($r = 0,270$ and $p = 0,001$ in the case of the pre-test; $r = 0,278$ and $p = 0,000$ in the case of the post-test) was found between students' reading proficiency scores and their average mark over all subjects prior to the final examination (referred to as "year mark"). This implies that students who are more proficient at reading obtain higher marks in all their subjects than their counterparts who struggle to cope with textual materials. This can be concluded with a 99% certainty as the correlation was performed at $\alpha = 0,01$. However, although a positive, statistically significant

correlation was found between reading performance and academic achievement, the relationship was weak to moderate.

To determine exactly to which extent students' reading performance scores can be used to predict their academic results, the coefficient of determination was calculated by squaring the value of the correlation coefficient, i.e. $r^2 = (0,27)^2 = 0,073 = 7,3\%$. This implies that 7,3 percent of the variance in a student's year mark is shared with the variance in a student's score for reading skills, i.e. 7,3% of the year mark can be predicted when the student's reading score is known. Hence, 92,7% (1 - 0,073 = 0,927) is error variance, i.e. 92,7% of a student's academic achievement is attributable to factors other than reading proficiency.

The proportion of shared variance between the two variables, i.e. between reading proficiency and academic achievement, is graphically depicted in figure 2 below.

FIGURE 2: SHARED VARIANCE BETWEEN STUDENTS' READING PROFICIENCY AND ACADEMIC ACHIEVEMENT



NOTE: Not drawn to scale

Statistically, then, it was shown that inadequate reading skills do indeed contribute to poor academic performance among first-year ESL students at the Border Technikon, albeit to a rather limited extent. The fact that only

7,3% of the year mark can be predicted by using a student's reading score supports the research findings of Court (1988:160), who claims that language proficiency is not a reliable predictor of the academic success of students coming from disadvantaged backgrounds. Although the results presented in this study are, in a sense, also consistent with those reported by Kokong (1991:80), who argues that students' academic results can be improved by improving their reading proficiency in English, it must be emphasized that the findings of this study suggest that an ESL student's academic results can be improved by only 7,3% by enhancing his or her English reading skills.

At this point, it might be valuable to consider the following statement made by Rosnow and Rosenthal (1996:260-261) regarding the practical value of the coefficient of determination, from which the value of 7,3% was derived: "The coefficient of determination has its uses in a number of situations, but it is a poor indicator of the effect size because in almost all cases it underestimates the practical importance of the observed outcome."

By conventional standards, the value of 7,3% seems to indicate a relatively small common variance. Yet the practical importance of this value might be more significant than it seems. Even a relatively small common variance such as 7,3% could make a huge difference with regard to the number of students either passing or failing their respective courses. Many students are borderline cases, which means that they could possibly obtain a pass mark if their reading proficiency is improved to such an extent that it leads to a 7,3% increase in their respective course grades. From the above, it follows that a considerably higher pass rate among first-year ESL students could be obtained by improving their reading skills in English, even so that the correlation between English reading proficiency and academic achievement

appears to be relatively weak. The practical value of improving students' reading proficiency in English is therefore indisputable.

5.2.3 The impact of the Reading Laboratory on Border Technikon students' reading proficiency

The objective was to ascertain whether first-year ESL students at the Border Technikon do indeed benefit from regular attendance of the reading laboratory. The research sample consisted of an experimental group who attended the reading laboratory once a week and a control group who received no such support during the course of their studies.

To start off with, comparability of the experimental and control groups had to be verified. This was especially important in view of the fact that students in the experimental and control groups were enrolled for vastly different courses, ranging from Analytical Chemistry to Fashion, and that the experimental group was considerably larger than the control group.

The following hypotheses were formulated in this regard:

H_a : Mean of experimental group = Mean of control group in terms of pre-test stanine scores

H_1: Mean of experimental group ≠ Mean of control group in terms of pre-test stanine scores

Table 4 compares the mean of the experimental group's pre-test stanine scores with that of the control group.

TABLE 4: PRE-TEST STANINE SCORES OF THE EXPERIMENTAL AND CONTROL GROUPS

	N	Mean	Std. deviation	Std. error of mean
Experimental Group	100	4,80	1,48	0,15
Control Group	56	4,71	1,44	0,19

An independent samples t-test (two-tailed) was performed to calculate the difference between the pre-test reading scores of the experimental and control groups, i.e. of those students who went to the reading laboratory and those who did not. The alpha level was set at 0,05. The results are given in Table 5.

TABLE 5: RESULTS OF THE INDEPENDENT SAMPLES T-TEST (BASED ON THE EXPERIMENTAL AND CONTROL GROUPS' PRE-TEST STANINE SCORES)

Mean difference	t-value	p-value
0,0857	0,351	0,726

As can be seen from Table 5, the value of $p > 0,05$ for the pre-test stanine scores. We therefore accept the null hypothesis. In other words, there is no difference between the experimental and control groups in terms of their pre-test stanine scores. The groups are therefore deemed to be comparable.

To determine whether the experimental group's reading performance improved as a result of students' exposure to the reading laboratory from February until September 1999, a dependent samples t-test (two-tailed) was

performed to calculate the difference between the means of the pre-test and post-test stanine scores of the experimental group. Results are given in Table 6 below.

TABLE 6: RESULTS OF THE DEPENDENT SAMPLES T-TEST (BASED ON THE PRE-TEST AND POST-TEST STANINE SCORES OF THE EXPERIMENTAL GROUP)

Mean difference	t-value	p-value	Std. deviation	Std. error of mean	Degrees of freedom
-0,48	-5,064	0,000	0,95	0,09448	99

The following hypotheses were formulated in this regard:

H_o : There is no significant difference between the mean of the pre-test stanine scores and the mean of the post-test stanine scores of the experimental group

H_1: The mean of the pre-test stanine scores differs significantly from that of the post-test stanine scores of the experimental group

The results of the dependent samples t-test indicated that there was a significant difference ($p < 0,05$) between the reading performance scores of the experimental group at the beginning and at the end of the computer-aided reading course. Therefore the null hypothesis is rejected and the alternative hypothesis H_1 accepted. The t-value of -5,064 indicated an improvement in students' reading ability.

However, to validate that this improvement was not due to chance factors, the difference between the means of the pre-test and post-test scores of the control group also had to be calculated to determine whether the control group's reading performance showed any variation over the same period of time. A dependent samples t-test (two-tailed) was therefore performed to calculate the difference between the means of the pre-test and post-test stanine scores of the control group. Results are given in Table 7 below:

TABLE 7: RESULTS OF THE DEPENDENT SAMPLES T-TEST (BASED ON THE PRE-TEST AND POST-TEST STANINE SCORES OF THE CONTROL GROUP)

Mean difference	p-value	t-value	Degrees of freedom
-0,43	0,000	-4,690	55

The following hypotheses were formulated in this regard:

H_o : There is no significant difference between the mean of the pre-test stanine scores and the mean of the post-test stanine scores of the control group.

H_1: The mean of the pre-test stanine scores differs significantly from that of the post-test stanine scores of the control group.

As can be seen from Table 7, the results of the dependent samples t-test indicated that there was a significant difference ($p < 0,05$) between the reading performance scores of the control group, as measured in February and again in September 1999. Therefore the null hypothesis is rejected and

the alternative hypothesis H_1 accepted. The t-value of –4,690 indicated an improvement in students' reading ability.

When the difference between the means of the pre-test and post-test stanine scores of the experimental group is compared with that of the control group, it becomes apparent that both groups improved virtually to the same extent. The conclusion to be drawn is that the reading programme was not responsible for the observed improvement in the reading performance of the experimental group. The most plausible explanation for the fact that the reading performance of both groups improved practically to the same degree is that the language proficiency of both groups improved over time, simply as a result of the students having been at the Technikon for a period of nine months. Statistically, then, it was shown that the reading laboratory did not have any impact on students' reading performance. For all practical purposes, the reading laboratory can be regarded as ineffective.

5.3 Interpretation of qualitative research results

5.3.1 Students' experiences with textbooks

To assess whether students were experiencing problems with their textbooks, all students in the research sample were requested to complete a questionnaire handed out to them in class. A copy of the questionnaire has been included as an appendix to this study. A total of 214 completed questionnaires were collected.

Altogether 112 students (52%) indicated that they found at least one of their prescribed textbooks difficult to understand. Unfortunately many responses were very vague, so that it was not always possible to judge whether students'

comprehension problems were language-related or not. Only 25 students (12%) specifically indicated that they experienced problems with the language used in a particular textbook. Ten handbooks were singled out by students as being particularly hard to grasp.

5.3.2 Students' attitudes towards the Reading Laboratory

To assess students' attitudes towards the reading programme, all students who attended the reading laboratory were requested to complete a six-item questionnaire. A copy of the questionnaire has been included as an appendix to this study. A total of 85 completed questionnaires were collected.

From students' written responses to the questionnaire it appears that they generally had a very positive attitude towards the reading programme. The overwhelming majority of students (88%) indicated that they enjoyed going to the reading laboratory. They mentioned that the reading programme was "*fun*" to use because they had the opportunity to work on a computer. One student wrote the following:

> *I enjoyed going to the lab because at high school I didn't have the opportunity to do grammar with the computer.*

One does tend to suspect, however, that becoming acquainted with the computer was of more importance to students than improving their reading proficiency was.

A large number of students (78%) felt that their academic results were indeed influenced by their inability to read English fluently and correctly. One student made the following comment:

Many students fail their courses not because they do not study, but because they fail to understand English properly.

In general, students made some remarkably insightful comments to substantiate their views, such as:

...if one does not understand English then they cannot understand what is said in the lectures and subsequently what is in the notes.

Another student remarked:

...many students do not understand what the lecturer said in the class and they do not ask questions in the class if there is something he/she do not understand. He/she is afraid of his poor English.

Students (43%) also blamed their poor academic results on aspects such as the poor grounding they had received in rural or township schools, their general lack of exposure to the written word and their secondary school teachers' poor English skills:

Some of us come from bantu education and the teachers themselves are not fluent in their english so how can the students be?

Another student echoed the above-mentioned view:

Some students were studying from the black schools. Most of them were speaking Xhosa at schools and teachers explained everything in Xhosa, even Biology and English.

A few students (22%) believed that their fellow students did not perform well academically simply because the subject content was too difficult or because they were not working hard enough.

Most students (77%) felt that they had benefited from the reading laboratory sessions, although a few (12%) remarked that they probably would have gained more if they had been able to attend for a longer period of time. One student, for instance, wrote:

> *There was little time to go to labs. If there was enough time I think we will gain a lot.*

A small number of students (23%) expressed their doubts as to whether the reading laboratory had actually helped them in improving their English skills:

> *Because there was limited time and short term, I would not say it help me.*

From comments such as the previous one, it becomes clear that students also considered one period of 45 minutes per week to be inadequate.

Some students recommended that the reading laboratory should be made compulsory for all first-year students. Two of these recommendations are quoted below:

> *I think all first year students in a tertiary institution should go to the reading laboratory so that they may understand what they are studying.*

and

> *I think the lab must be used full time (i.e. it must be compulsory for all 1st year students).*

It was also recommended that reading laboratory sessions should take place more often, not only once a week:

> *I recommend that you go down to the roots of the language. Try to have laboratory reading sestions more often."*

5.4 Conclusion

By combining both quantitative and qualitative data, this chapter attempted to provide some new insights into the reading performance of first-year ESL students at the Border Technikon, the relationship between these students' English reading proficiency levels and their academic results, and the effectiveness of the Language Development Programme introduced by the Border Technikon to improve students' English language skills through regular reading practice in the reading laboratory.

The findings of this study suggest that almost 50% of the students who participated in the study are poor readers who experience serious problems in reading texts written in English. In fact, more than 50% of the students in the sample group indicated that they experienced some problems with their textbooks. Furthermore, the students seem to believe that their inability to read well in English influences their academic progress. Statistical analyses of the data revealed that this belief is indeed well founded in that a significant, positive correlation exists between the students' reading performance and their academic achievement. This suggests that the research subjects' marks in all subjects are influenced to some extent by their inability to read well in English, which is the language of instruction used at the Border Technikon. However, the relationship between students' reading performance and their academic achievement was found to be weak to moderate, with only 7,3% of a student's year mark being attributable to his or her English reading proficiency. Although the correlation appears to be relatively small in magnitude, to many borderline students the practical effects of this modest relationship may mean the difference between their passing or failing their respective courses. Improving ESL students' reading skills in English

therefore seems to be quite an important factor in improving the pass rate among first-year students.

A large number of participants (77%) also believed that, despite time restraints, the reading laboratory had actually helped them to improve their English reading skills. However, this seems to be a misconception, as statistical analyses of the data revealed that the Language Development Programme that has been implemented by the Border Technikon in an effort to improve students' language proficiency through regular computer-based reading practice does not meet performance expectations. Although students generally seem to enjoy working on the computer, the programme has been found to be ineffective in improving students' reading skills.

Chapter 6
CONCLUSIONS AND RECOMMENDATIONS

6.1 Limitations of the study

A possible limitation of this study is that the same test was used for pre-test and post-test purposes. According to Brown (1991:35), repeated use of the same test in a study can influence the test results because of the research subjects' familiarity with the questions. The test was also not entirely grade-appropriate, in that it was used to compare the reading performance of thirteenth-graders with that of a national sample of Grade 10, 11 and 12 pupils. A further limitation of this study is that the participants were not randomly selected. The reasons for this decision were explained in chapter 4.

6.2 Generalizability of the findings

Although the research subjects had been purposively selected for this study, it is believed that the sample group was fairly representative of the first-year Border Technikon student population at large, for the following reasons:

- the sample size was quite large
- five different courses of a very diverse nature were represented, ranging from Fashion on the one extreme to Analytical Chemistry on the other.

Considering the large number of recent research studies that focused on the inadequate language skills and poor academic results of black tertiary students in South Africa (see chapter 2), it is furthermore believed that the results of this study can probably be generalized to other tertiary institutions with a

similar student population. However, further research would be needed to substantiate this claim.

6.3 Recommendations

Since the findings of this study suggest that more than 50% of all students admitted to the Border Technikon find it difficult to understand their textbooks, it is recommended that the readability of textbooks prescribed for first-year Border Technikon students be investigated as a matter of urgency. This becomes all the more important in light of the fact that almost 50% of the first-year student population is below the national average when it comes to reading proficiency in English.

As far as the controversy about the relationship between language proficiency and academic success is concerned, this study suggests that a positive, statistically significant relationship exists between ESL students' English reading proficiency and their academic achievement in all subjects. However, this relationship has been found to be weak to moderate, with reading proficiency accounting for only 7,3% of first-year Border Technikon students' academic performance. Reading proficiency is obviously only one of a number of factors impacting on students' academic achievement. Yet, in light of the fact that a 7,3% increase in students' year marks can make a big difference with regard to students either passing or failing their courses, this relationship is considered to be meaningful. Because many students are borderline cases, this study argues that a considerably higher pass rate among ESL students could be obtained if their reading proficiency in English is improved. Given the high first-year failure rate, improving ESL students' reading skills in English should be regarded as a key issue by all tertiary institutions where English is used as the medium of instruction. Playing a

proactive role in this regard could even be seen as a form of affirmative action - an attempt to rectify educational inequalities resulting from previous discriminatory practices during the apartheid era. In this context, it would obviously be necessary to ensure that all first-year students be afforded the same opportunities. The reading laboratory, for instance, should be accessible to all first-year students, not only to a selected few. It is therefore recommended that Border Technikon make it possible for all first-year students to develop their English language skills by affording them the opportunity of attending the reading laboratory on a regular basis.

Not only do tertiary institutions have to find ways to improve students' reading proficiency in the language of instruction, they also have to introduce internal quality control measures to ensure that their methods are indeed effective. In the case of the Border Technikon, the findings of this study have proved beyond any doubt that the Language Development Programme does not meet its objectives. It is therefore recommended that the Communications Department at the Border Technikon pay special attention to correctly identifying, and addressing, any issues which might have had a detrimental impact on the reading laboratory's effectiveness. The role of external influences, e.g. student attendance, the duration of the programme, frequency of practice sessions, total number of reading laboratory hours, the proficiency of tutors and students at using the computer program, etc. should all be taken into account. It is also recommended that the effectiveness of the programme be re-evaluated at regular intervals once corrective action has been taken. In fact, this policy of continuous assessment should be adopted by all tertiary institutions that have instituted similar language development or academic support programmes. It is inexcusable to simply assume that the objectives of these programmes will automatically be met.

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APPENDIX A: STUDENT QUESTIONNAIRE COMPLETED BY EXPERIMENTAL GROUP AND CONTROL GROUP

SURNAME: .....

STUDENT NO:.....

COURSE: .....

1. Please write down the full name of the school where you matriculated.

   .....

   .....

2. Did you grow up in a rural area or an urban area?

Rural	Urban

3. What matric symbol did you obtain for English? .....

4. What is your mother tongue? .....

5. How old are you? .....

6. Are you male or female?

Male	Female

7. Please explain briefly how you feel about the textbooks which are prescribed for each of your subjects. (Do you find them easy or difficult? Why? Please quote the titles of any textbooks that you find particularly difficult to understand.)

   .....

   .....

   .....

   .....

APPENDIX B: STUDENT QUESTIONNAIRE COMPLETED BY EXPERIMENTAL GROUP

SURNAME: .....

STUDENT NO:.....

COURSE: .....

SEX:..... AGE:.....

1. Some people say that the academic results of tertiary students are poor because many students struggle to read English fluently and correctly. Do you agree with this statement?

   YES ☐

   NO ☐

2. Please explain briefly why you agree/disagree with the statement made in question 1.

   .....

   .....

   .....

3. Did you enjoy going to the reading laboratory?

   YES ☐

   NO ☐

4. Please give a reason for your answer to question 3.

   .....

   .....

   .....

5. Do you think your English skills improved because you attended the reading laboratory? Please supply a reason for your answer, if necessary.

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   .....

   .....

6. Do you have any recommendations for improvement?

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   .....

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