Content-based strategic reading instruction within a
distributed learning environment

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NOTICE

This thesis has been written in an article format. The format, structure, layout, writing style, and manner of referencing sources differ in each of the chapters. The reason is that each article conforms to the in-house style of the particular journal to which the article was sent.

The articles have all been submitted to and/or accepted by accredited national and international journals:


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SUMMARY

Key words: language learning strategies; reading strategies; reading comprehension; content-based approach; English Second Language; motivation; language proficiency; technology-enhanced.

Research conducted in South Africa indicates that many South African students who register for undergraduate study each year are under-prepared for university education and that many of these English Second Language students also have low levels of reading ability. This has an adverse effect on their chances of academic success. These students very often become part of the “revolving door syndrome”. In order to meet the reading needs of students in the 21st century, educators are pressed to develop effective instructional means for teaching strategic reading at tertiary level.

In order to help students acquire the strategic reading abilities deemed necessary for a successful academic experience, the Department of English at Potchefstroom University implemented a content-based strategic reading module. This module was offered to students via Varsite (technology-enhanced aspect of the module); a learning content management system developed at Potchefstroom University. This system provides an integrated environment for developing, managing and delivering learning content.

The purpose of this study was to:

- discuss the structure and format of the content-based strategic reading module as developed and implemented for delivery within a distributed learning environment;
- determine what the reading comprehension and reading strategy use profile of first-year students at Potchefstroom University looks like;
- determine whether the students in the experimental group, who completed the strategic reading component of the English for Professional Purposes course in a technology-enhanced environment, attained statistically as well as practically significantly higher mean scores on their end-of-semester English, Communication Studies, and TOEFL reading comprehension tests, than did the
students in the control group, who were not exposed to the technology-enhanced environment;
- determine whether the students in the experimental group differed statistically as well as practically significantly from the students in the control group in terms of their reading strategy use;
- determine the scope of the reading problem among the first-year students participating in this study;
- identify the strengths and weaknesses in the reading assessment profiles of one efficient and one inefficient student;
- make recommendations in terms of the reading support needed by these students;
- identify the factors that can affect first-year English Second Language (ESL) students' acceptance and use of the technology-enhanced component of a strategic reading module offered via mixed mode delivery;
- determine which factors can be considered as statistically significant predictors of technology acceptance and use by first-year ESL students; and
- discuss the implications of the above-mentioned results for the designing of technology-enhanced courses as well as the support that should be given to ESL learners who must use the technology.

In this study a combined qualitative and quantitative research method was used. A Dominant-Less Dominant design was used. The qualitative research approach was consistent with naturalistic case study methodology. For the quantitative research component a quasi-experimental non-randomised pre-test post-test control group design was used.

The participants in this study included the entire population of one hundred and thirty-one students taking the English for Professional Purposes module. The students included speakers of Afrikaans and Setswana. These students majored in Communication Studies and Psychology.

Ten paper-and-pencil instruments were used in this study. In addition to the paper-and-pencil instruments, various qualitative data collection methods were also used,
namely semi-structured interviews, e-mail messages, informal conversations and the researcher's field notes.

The data were analysed by means of descriptive (i.e., means, standard deviations) as well as multivariate statistics (i.e., Pearson product moment correlations; t-tests; factor analyses; and stepwise multiple regression).

The results of the study can be summarised as follows:

The strategic reading module of the English for Professional Purposes course was designed for mixed mode delivery. The structure and format of the strategic reading module consisted of an interactive study guide, contact sessions, and Varsite (i.e., a learning content management system).

The results indicated that the students who received strategic reading instruction in the technology-enhanced environment received both statistically and practically significantly higher marks on three reading comprehension measures than did the students in the control group. This was true for successful students, as well as for those considered to be at-risk. The post-test results indicated that the students in the experimental group used certain strategies statistically (p<0.05), as well as practically significantly (small to large effect sizes), more often than the students in the control group.

An analysis of the reading assessment profiles of the students participating in this study indicated that they experienced problems across all aspects of the reading components assessed (vocabulary, fluency, and reading comprehension and reading strategies). An analysis of the successful student's reading assessment profile indicated that his/her profile was far flatter than that of the at-risk student; the successful student had far fewer ups and downs in his/her profile than the at-risk student (i.e., the majority of the successful student's mean reading assessment scores were scattered around or above the norm/guidelines for first-year students).

The results of an exploratory factor analysis indicated that computer self-efficacy, ease of use, enjoyment, outcome expectations, usefulness, and quality of resources were major factors affecting ESL students' acceptance and use of the technology-enhanced component of a strategic reading module. In addition, the results of the
multiple regression analysis indicated that approximately 71% of the total variance of Varsite acceptance and use was explained by computer self-efficacy, ease of use, enjoyment, and outcome expectations. Usefulness and the quality of the resources also contributed to the total variance, but the contribution was not statistically significant.
Navorsing wat in Suid-Afrika gedoen is, dui daarop dat baie Suid-Afrikaanse studente wat elke jaar vir voortgaande studie registreer, onvoorbereid is vir universiteitsopleiding en dat baie van die Engels Tweede Taal-studente swak leesvermoëns openbaar. Dit het 'n ongunstige effek op studente se akademiese sukses. Hierdie studente word baie maklik deel van die “revolving door”-sindroom. Om aan die leesbehoeftes van studente in die 21ste eeu te voldoen, word opvoeders gedruk om effektiewe onderrigmetodes vir die leer van strategiese lees op tersiëre vlak te ontwikkel.

Om studente te help om die nodige strategiese leesvermoëns vir 'n suksesvolle akademiese ervaring te ontwikkel, het die Engelse Departement aan die Potchefstroomse Universiteit 'n inhoudgebaseerde strategiese leesmodule geïmplementeer. Hierdie module is aan studente via Varsite (tegnologie-verrykte aspek van die module) aangebied; 'n leerinhoudbestuursisteem ontwikkel by die Potchefstroomse Universiteit. Dié sisteem verskaf 'n geïntegreerde omgewing vir die ontwikkeling, bestuur en lewering van leerinhoud.

Die doel van die studie was om:

- die struktuur en formaat van die inhoudgebaseerde strategiese leesmodule te bespreek soos dit ontwikkel en geïmplementeer is vir lewering binne 'n verspreide (distributed) leeromgewing;
- te bepaal hoe die lessebegrip en leesstrategiegebruiksprofiel van eerste jaar studente aan die Potchefstroomse Universiteit daar uitsien;
- te bepaal of studente in die eksperimentele groep, wat die strategiese leeskomponent van die English for Professional Purposes-kursus binne 'n tegnologie-verrykte omgewing voltooi het, statisties sowel as prakties beduidende hoër gemiddelde vir hulle Engelse eindsemester, Kommunikasiestudies en TOEFL-leesbegripptoetse behaal het as die studente
in die kontrole groep, wat nie blootgestel was aan die tegnologie verrykte omgewing nie;

- te bepaal of die studente in die eksperimentele groep statisties sowel as prakties betekenisvol van die studente in die kontrole groep verskil het in terme van hulle gebruik van leesstrategieë;

- te bepaal wat die omvang van die leesprobleem was onder eerste jaar studente, wat aan die studie deelgeneem het;

- die sterk- en swakpunte in die leesassessoringsprofiële van een effektiewe en een oneffektiewe student te identifiseer;

- voorstelle te maak in terme van die leeshulp wat hierdie studente benodig;

- faktore te identifiseer wat eerste jaar Engels Tweede Taal-studente se aanvaarding en gebruik van die tegnologie-verrykte komponent van die strategiese leesmodule, aangebied via gemengde modus aflewering, affekteer;

- te bepaal watter faktore as statisties betekenisvolle voorspellers van tegnologie aanvaarding en gebruik onder eerste jaar Engels Tweede Taal-studente beskou kan word;

- die implikasies van bogenoemde resultate vir die ontwerp van tegnologie-verrykte kursusse te bespreek, sowel as die ondersteuning wat gebied moet word aan Engels Tweede Taal-leerders wat dié tegnologie moet gebruik.

In hierdie studie word 'n gekombineerde kwalitatiewe- en kwantitatiewe navorsingsmetode gebruik. 'n Dominant-Minder Dominante ontwerp word toegepas. Die kwalitatiewe metode was konsekwent met naturalistiese gevallene-studie-metodologie. Vir die kwantitatiewe navorsingskomponent is 'n kwasi-eksperimentele nie-ewekansige voortoets natoets kontrole groepsontwerp gebruik.

Die deelnemers in hierdie studie sluit die totale populasie van een-honderd-en-en-dertig studente, ingeskryf vir die English for Professional Purposes-module, in. Dié studente se hoofvakke was Kommunikasiestudies en Sielkunde, en sluit Afrikaanssprekendes sowel as sprekers van Setswana in.
Tien papier-en-potlood instrumente is gebruik in die studie. Addisioneel tot die papier-en-potlood instrumente, is verskeie kwalitatiewe data insamelingsmetodes ook gebruik, naamlik semi-gestruktureerde onderhoude, e-pos boodskappe, informele gesprekke en die navorser se veldnota's.

Die data is geanaliseer deur van deskriptiewe (d.w.s. gemiddeldes, standaard afwykings) sowel as inferensiële statistiek (d.w.s. Pearson produkmomentkorrelasies; t-toetse; faktoranalises; en stapsgewyse meervoudige-regressie-analise) gebruik te maak.

Die resultate van die studie kan as volg opgesom word:
Die strategiese leesmodule van die English for Professional Purposes-kursus was ontwerp vir gemengde modus afelevering. Die struktuur en formaat van die strategiese leesmodule het bestaan uit 'n interaktiewe studiegids, kontaksessies, en Varsite ('n leerinhoudbestuursisteem).

Die resultate het daarop gedui dat studente wat strategiese leesonderrig in die tegnologie-verrykte omgewing ontvang het, beide statisties en prakties beduidende hoër punte in drie leesbegripstoets behaal het as dié in die kontrole groep. Dit was die geval vir beide suksesvolle studente, sowel as dié wat as risiko gevalle beskou is. Die natoets resultate het daarop gedui dat studente in die eksperimentele groep spesifieke strategieë statisties (p<0.05), sowel as prakties betekenisvol (klein tot groot effekgroottes), meer gereeld als studente in die kontrole groep gebruik het.

'n Analise van die leesassesseringsprofiele van die studente wat aan hierdie studie deelgeneem het, dui daarop dat hulle probleme ondervind het in al die aspekte van die leeskomponent wat geassesseer is (woordeskat, vlotheid/vloeiendheid, leesbegrip en leesstrategieë). 'n Analise van die suksesvolle student se leesassesseringsprofiel het aangedui dat sy/haar profiel baie plat was as die van die risiko student; die suksesvolle student het baie minder op en af kurwes in sy/haar profiel as die risiko student (d.w.s. die meerderheid van die suksesvolle student se gemiddelde leesassesseringsstellings was verspreid om of bo die norm/riglyne vir eerste jaar studente).
Die resultate van 'n ondersoekende faktoranalise het aangedui dat rekenaarselfdoeltreffendheid, maklike gebruik, genot, uitkomsverwagtinge, bruikbaarheid, en kwaliteit van bronne belangrike faktore was in Engels Tweede Taal-studente se aanvaarding en gebruik van die tegnologie verrykte komponent van die strategiese leesmodule. Bykomend hiertoe, het die resultate van die meervoudige-regressie-analise daarop gedui dat omtrent 71% van die totale variansie van Varsite se aanvaarding en gebruik, verduidelik kon word aan die hand van rekenaarselfdoeltreffendheid, maklike gebruik, genot en uitkomsverwagtinge. Bruikbaarheid en die kwaliteit van die bronne het ook bygedra tot die totale variansie, maar dié bydrae was nie statisties betekenisvol nie.
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and higher pass rates on ESL courses. She also provides quantitative evidence that such students establish and retain a performance advantage over students exposed to non-content based EAP training.

Content-based instruction develops linguistic competence and functional literacy by exposing ESL learners to interdisciplinary input that consists of both "everyday" communicative and academic language (Cummins, 1981; Mohan, 1990) and that
CHAPTER 1

Introduction

1.1 Problem statement
Succeeding in a digital, information-oriented society demands multiliteracies, that is, competence in a diverse set of functional, academic, critical and electronic skills (Kasper, 2000a). Although becoming multiliterate is not an easy task for any student, it is especially difficult for ESL students operating in a second language. In their attempts to become multiliterate, ESL students must acquire linguistic competence in a new language and at the same time develop the cognitive and sociocultural skills necessary to gain access into the social, academic, and workforce environments of the 21st century (cf. Pally, 1997; Kasper, 2000b). The result is that more and more learners have highly specific academic and professional reasons for seeking to improve their English language skills.

An increasing demand world-wide for English language skills in tertiary education has, therefore, led to the establishment of courses such as English for Academic Purposes, English for Specific Purposes and other related courses at institutions throughout the world (cf. Bamford & Day, 1998; Van Wyk, 2001). A large body of research conducted over the past decade (cf. Benesch, 1988; Brinton et al., 1989; Crandall, 1993; Kasper, 1997; Pally, 2000; Snow & Brinton, 1997; Grabe & Stoller, 1997) has shown that content-based instruction (CBI) is highly effective in helping ESL students develop the literacies they need to be successful in academic and workforce environments. The work of Kasper (1997; 2000a; 2000b; 2000c; 2002) has reported both improved language and content performance among students exposed to content-based EAP programmes, higher scores on measures of reading proficiency, and higher pass rates on ESL courses. She also provides quantitative evidence that such students establish and retain a performance advantage over students exposed to non-content based EAP training.

Content-based instruction develops linguistic competence and functional literacy by exposing ESL learners to interdisciplinary input that consists of both "everyday" communicative and academic language (Cummins, 1981; Mohan, 1990) and that
contains a wide range of vocabulary, forms, registers, and pragmatic functions (Zuengler & Brinton, 1997). Because content-based pedagogy encourages students to use English to gather, synthesize, evaluate, and articulate interdisciplinary information and knowledge (Pally, 1997), it also allows them to hone academic and critical literacy skills as they practise appropriate patterns of academic discourse (Kasper, 2000c). The theoretical foundations supporting a content-based model of ESL instruction derive from cognitive learning theory and second language acquisition research. Cognitive learning theory posits that in the process of acquiring literacy skills, students progress through a series of three stages, the cognitive, the associative, and the autonomous (Anderson, 1983). Progression through these stages is facilitated by scaffolding, which involves providing extensive instructional support during the initial stages of learning and gradually removing this support as students become more proficient at the task (Chamot & O’Malley, 1994). Second language acquisition research emphasises that literacy development can be facilitated by providing multiple opportunities for learners to interact in communicative contexts with authentic, linguistically challenging materials that are relevant to their personal and educational goals (e.g. Brinton et al., 1989; Kasper, 2000a; Krashen, 1982; Snow & Brinton, 1997).

Electronic literacy now also counts among the basic skills necessary for success at university and within the workforce (cf. Shetzer, 1998; Warschauer, 1999). Finding ways to use technology to support course/module outcomes has, therefore, become increasingly important (cf. Falk-Ross, 2001/2002; Pally, 1997; 2000). According to Kasper (2000b:109), content-based instruction "is inherently task-based, student-centred, and project-oriented and so offers a natural context for the integration of technology into instruction.”

A decision by the Senate of Potchefstroom University for CHE in 1998, namely that: "The PU for CHE wants to offer, with flexible learning (which encompasses all learning environments), cost-effective and accessible higher educational programmes of high quality in a learner centred approach" and that "the judicious use of information technology will play an important role in reaching this objective” (Volschenk, 2002), has paved the way for the development of a number of courses
offered within a distributed learning environment (i.e., contact sessions enhanced by technology).

According to a report in a South African newspaper, the Sunday Times (2000), at least 100 000 students drop out of tertiary institutions each year, and institutions have poor follow through rates (70% and below) and poor graduation rates (15% or below). There is, therefore, a critical need for institutions to be able to profile with some accuracy the learner variables that can affect the academic achievement of specifically their first-year students.

A key, but often overlooked, skill that is essential to academic and professional success is reading ability (cf. Rings, 1994; Strydom, 1997). This is surprising, since a majority of L2 learners need to read a vast amount of text for their academic courses, and may need help with reading of long texts and the assimilation of information from a variety of sources (cf. Blue, 1993; Sengupta, 2002). Pritchard et al. (1999:77) state that: "When it is recognised that reading is one aspect of the language continuum and also involves the development of speaking and writing ability, it is obvious that better business literacy cannot be fostered without serious attention to reading". According to Richardson et al. (1983) and Blue (1993), students at tertiary level are required to understand the overall content, distinguish main points from supporting detail, skim, scan, question, look for assumptions and intentions, analyse, synthesise and evaluate. However, research indicates that a small but significant number of first-year university students commence their studies with less than adequate reading comprehension abilities and reading strategy use (Dreyer, 1998; Van Wyk, 2001; Falk-Ross, 2001/2002). According to Strydom (1997), this has an adverse effect on their chances of academic success. Many first-year students, therefore, enter tertiary institutions unable to meet the expectations of the academic community (cf. Bartholomae & Petrosky, 1986; Strydom, 1997; Van Wyk, 2001).

Orndorff (1987) states that the inability of many students to read critically and with comprehension may be the single most important problem in tertiary education. Not only do students have difficulty selecting authors' main ideas and seeing how they have been developed into a coherent whole, but they are also unable to synthesise and restructure ideas, especially from complex texts (cf. Spring & Prager, 1992). In many
first language studies, the use of various strategies has been found to be effective in improving students' reading comprehension (Baker & Brown, 1984; Palinscar & Brown, 1984). A study by Brown et al. (1986) indicates that there is a relationship between the types of reading strategies learners use and proficiency level. Better readers also have an enhanced metacognitive awareness of their own use of strategies and what they know, which in turn leads to greater reading ability and proficiency (cf. Pressley & Aflerbach, 1995). Metacognition in reading, therefore, involves knowledge of comprehension strategies (cf. Garner, 1990; Nist & Holschuh, 2000).

Students who have problems with reading comprehension and do not use reading strategies optimally come unprepared for the academic literacy requirements that typically characterise university coursework (cf. Pugh et al., 2000), and that may very well be a part of their upcoming job responsibilities (cf. Conference Board of Canada, 1991; Department of Education, 1997; Kasper, 2000a; 2000b).

In order to meet the reading needs of students within the 21st century, educators are pressed to develop effective instructional means for teaching reading comprehension and reading strategy use (cf. Kasper, 2000b; Singhal, 2001; van Wyk, 2001). According to Moore and Kearsley (1996:102-123), an analysis of learner profiles is an essential step in the instructional design process. Silva (1994) states that course development should account for the proficiency levels, background, strategy use, and learner characteristics (e.g., learning styles) of each individual target group before deciding on the teaching approach and content. According to Schroeder (1996), the profiles of student populations are changing dramatically, and we need to respond to those changes. Research indicates that a "generic" profile of learners may not exist due to the dynamic nature of the individual learners and the continuously changing contextual factors (Dreyer, 2001; Dreyer & Bangeni, 2002). The knowledge gained from an analysis of learner profiles can then be applied to the designing and development of, for example, an English for Professional Purposes course.

Therefore, in order to help our students acquire the reading strategies and reading comprehension abilities deemed necessary for a successful academic experience, the Department of English at the University of Potchefstroom implemented a content-based strategic reading module. This module was offered to students via Varsite (technology-enhanced aspect of the module); a learning content management system
developed at Potchefstroom University. This system provides an integrated environment for developing, managing and delivering learning content.

The following research questions need to be addressed:

- What does the structure and format of a content-based strategic reading module as developed and implemented within a distributed learning environment (i.e., contact sessions enhanced by technology) look like?
- What does the reading comprehension and reading strategy use profile of first-year students at Potchefstroom University look like?
- Did the students in the experimental group, who completed the strategic reading component of the English for Professional Purposes course in a technology-enhanced environment, attain statistically as well as practically significantly different mean scores on their end-of-semester English, Communication Studies, and TOEFL reading comprehension tests, than did the students in the control group, who were not exposed to the technology-enhanced environment?
- Did the students in the experimental group differ statistically as well as practically significantly from the students in the control group in terms of their reading strategy use?
- What is the scope of the reading problem among the first-year students participating in this study?
- What are the strengths and weaknesses that can be identified in the reading assessment profiles of an efficient and an inefficient student?
- What recommendations can be made in terms of the reading support needed by these students?
- What factors affect first-year English Second Language (ESL) students’ acceptance and use of the technology-enhanced component of a strategic reading module offered via mixed mode delivery?
- What factors can be regarded as statistically significant predictors of technology acceptance and use by first-year ESL students?
- What are the implications of the above-mentioned results for the designing of technology-enhanced courses as well as the support that should be given to ESL learners who must use the technology?
1.2 Purpose of this study
The purpose of this study was to:

- discuss the structure and format of the content-based strategic reading module as developed and implemented for delivery within a distributed learning environment;
- determine what the reading comprehension and reading strategy use profile of first-year students at Potchefstroom University looks like;
- determine whether the students in the experimental group, who completed the strategic reading component of the English for Professional Purposes course in a technology-enhanced environment, attained statistically as well as practically significantly different mean scores on their end-of-semester English, Communication Studies, and TOEFL reading comprehension tests, than did the students in the control group, who were not exposed to the technology-enhanced environment;
- determine whether the students in the experimental group differed statistically as well as practically significantly from the students in the control group in terms of their reading strategy use;
- determine the scope of the reading problem among the first-year students participating in this study;
- identify the strengths and weaknesses in the reading assessment profiles of an efficient and an inefficient student;
- make recommendations in terms of the reading support needed by these students;
- identify the factors that can affect first-year English Second Language (ESL) students’ acceptance and use of the technology-enhanced component of a strategic reading module offered via mixed mode delivery;
- determine which factors can be considered as statistically significant predictors of technology acceptance and use by first-year ESL students; and
- discuss the implications of the above-mentioned results for the designing of technology-enhanced courses as well as the support that should be given to ESL learners who must use the technology.

1.3 Hypotheses
The following hypotheses were formulated for this study:
H₀: There is no difference in the reading strategy use profile of students exposed to a content-based strategic reading module, utilising Varsite, and the reading strategy use of students exposed to a content-based strategic reading module, not utilising Varsite;

H₀: There is no difference in the mean reading comprehension scores (English, Communication Studies and TOEFL) of students exposed to a content-based strategic reading module, utilising Varsite, and the achievement of students exposed to a content-based strategic reading module not utilising Varsite;

H₀: There are no significant predictors of technology acceptance and use by the first-year ESL students participating in this study.

1.4 Method of research

In this study a combined qualitative and quantitative research method was used. A Dominant-Less Dominant design was used (Creswell, 1994). The qualitative research approach was consistent with naturalistic case study methodology (Merriam, 1998). For the quantitative research component a quasi-experimental non-randomised pre-test post-test control group design was used.

The participants in this study included the entire population of one hundred and thirty-one students taking the English for Professional Purposes module. The students included speakers of Afrikaans and Setswana. These students majored in Communication Studies and Psychology.

Various instruments were used in this study:

- A Reading Strategies Questionnaire, based on the work of Oxford (1990), Pressley and Afflerbach (1995), Pressley et al. (1995), and Wyatt et al. (1993), was used to determine students' use of reading strategies.

- The TOEFL test was administered to determine the English proficiency of the students. The test consists of three sections that are separately timed: Listening comprehension, Structure and Written expression and Vocabulary and reading comprehension (reliability analysis - r=0.96 for total scores, N=215).

- Two reading comprehension tests, one within Communication Studies (drawn up in consultation with the lecturer teaching the specific Communication
module) and one within the English for Professional Purposes course, were used as a pre-test together with the reading comprehension section of the TOEFL in order to classify the students as "at risk" of failure or as "successful". Similar tests were used for post-test purposes.

- The vocabulary component of the ELSA Plus test for Higher Education and Training was used to measure the receptive vocabulary of the students.
- The Communication Vocabulary Test was used to test the students' Communication content-specific vocabulary.
- The Psychology Vocabulary Test was used to test the students' Psychology content-specific vocabulary.
- The Visagraph II eye-movement recording system was used to measure the efficiency of the fundamental reading process of students: visual/functional proficiency, perceptual development, and information processing competence.
- Section III of the TOEFL test, namely the Vocabulary and Reading Comprehension section, was administered to determine the vocabulary and reading comprehension of the students.
- The Reading Performance Test in English, Advanced Level, was used to determine the students' reading performance level in English within the range of Senior Secondary Performance Levels (i.e., Grades 10, 11 and 12).
- A survey questionnaire for determining the factors students' identified as having an affect on their acceptance and use of the technology-enhanced component of the strategic reading module was developed and used.

In addition to the above-mentioned instruments, various qualitative data collection methods were also used, namely semi-structured interviews, e-mail messages, informal conversations and the researcher's field notes.

The questionnaires were completed in scheduled tutorial periods within the first two weeks of the second semester of 2002. The TOEFL test was completed under testing
conditions as specified by Educational Testing Services. All background information was obtained from academic administration.

The data were analysed by means of descriptive (i.e., means, standard deviations) as well as multivariate statistics (i.e., Pearson product moment correlations; t-tests; factor analyses; and stepwise multiple regression).

1.5 Chapter division
Chapter 2 includes article 1 and focuses on teaching reading strategies and reading comprehension within a technology-enhanced learning environment.
Chapter 3 includes article 2 and focuses on an analysis of the reading profiles of first-year students at Potchefstroom University: A cross-sectional study and a case study.
Chapter 4 includes article 3 and focuses on factors affecting students' acceptance and use of the technology-enhanced component of a strategic reading module.
Chapter 5 contains the conclusion and recommendations for further research.
CHAPTER 2
Teaching reading strategies and reading comprehension within a technology-enhanced learning environment

Abstract
Research conducted in South Africa indicates that many South African students who register for undergraduate study each year are under-prepared for university education and that many of these students also have low levels of reading ability. This has an adverse effect on their chances of academic success. In order to meet the reading needs of students in the 21st century, educators are pressed to develop effective instructional means for teaching reading comprehension and reading strategy use. This paper outlines the format and structure of a strategic reading instruction component of an English for Professional Purposes course offered within a technology-enhanced environment. The results indicated that students who received strategic reading instruction in this environment received both statistically and practically significantly higher marks on three reading comprehension measures than did the students in the control group. This was true for successful students, as well as for those considered to be at risk.

1. Introduction

One of the most serious problems in higher education, but one which is often not recognized by either students or lecturers until some way into academic courses, is the problem of reading, perhaps because reading per se is not assessed. However, the results or outputs from reading are assessed.

Levine et al. (2000, p. 1) state: “The ability to read academic texts is considered one of the most important skills that university students of English as a Second Language (ESL) and English as a Foreign Language (EFL) need to acquire”. Reading comprehension has come to be the “essence of reading” (Durkin, 1993), essential not only to academic learning in all subject areas but also to professional success and, indeed to lifelong learning (Pritchard et al., 1999; Rings, 1994; Strydom, 1997). However, many students enter higher education under-prepared for the reading demands that are placed upon them. When pressed to read, they often select...
ineffective and inefficient strategies with little strategic intent (cf. Saumell et al., 1999; Wade et al., 1990; Wood et al., 1998). Often this is due to their low level of reading strategy knowledge and lack of metacognitive control (Dreyer, 1998; Strydom, 1997; Van Wyk, 2001). Another reason might be their inexperience coming from the limited task demands of high school and the fact that at the first-year level at Potchefstroom University 50% of the focus is still on knowledge reproduction.

This might not be so surprising when one considers that research conducted by Durkin (1979) revealed that teachers actually devoted only 2% of the classroom time designated for reading instruction to teaching students how to comprehend what they read. Twenty years later, not much seems to have changed (cf. Pressley et al., 1998). The situation in South Africa is not any different; in high school, reading comprehension instruction is limited to the assignment of a reading passage, accompanied by a number of short or multiple-choice questions relating to the passage (personal experience and observation). Even at the university level, it is often assumed that students have the skills and strategies needed to successfully comprehend expository text. Yet, there is little evidence to suggest that students at any level will acquire these skills and strategies if they have not been explicitly taught (Carrell, 1998).

Instruction can be effective in providing students with a repertoire of strategies that promote comprehension monitoring and foster comprehension. For students to become motivated strategic strategy users, they need “systematically orchestrated instruction or training” (Alexander, 1996, p. 90). In order to meet the reading needs of students within the 21st century, educators are pressed to develop effective instructional means for teaching reading comprehension and reading strategy use (Kasper, 2000a, b; Singhal, 2001; Van Wyk, 2001). The purpose of this article is, therefore, to address the following research questions: (a) What does the reading comprehension and reading strategy use profile of first-year students at Potchefstroom University look like? (b) Did the students in the experimental group who completed the strategic reading component of the English for Professional Purposes course in a technology-enhanced environment attain statistically and practically significantly higher mean scores on their end-of-semester English, Communication and TOEFL reading comprehension tests, and did they differ significantly in terms of their reading strategy use?
2. Strategic reading instruction within a technology-enhanced environment

A number of South African institutions (e.g., Potchefstroom University for CHE, Rand Afrikaans University, University of Pretoria and the University of South Africa) are using information and communication technologies (e.g., the internet) for the first time as part of the teaching and learning process (cf. Dreyer, 2001; Grobler and Henning, 2001; Jordaan, 2001; Heydenrych, 2001). A decision by the Senate of Potchefstroom University for CHE in 1998, namely that: “The PU for CHE wants to offer, with flexible learning (which encompasses all learning environments), cost-effective and accessible higher educational programmes of high quality in a learner-centred approach” and that “the judicious use of information technology will play an important role in reaching this objective” (Volschenk, 2002) has paved the way for the development of a number of courses offered within a technology-enhanced environment.

However, as Chun and Plass (2000:152) point out, “the use of a networked environment for learning in general and for second language acquisition in particular raises many questions regarding the design of these environments that differ from the traditional design of text-based and stand-alone systems”. On the one hand, there are numerous reasons in favour of integrating the Internet into a language curriculum (cf. Chun and Plass, 2000, p. 161), and on the other hand, several arguments can be made that ask for a more cautious approach when using the Internet (Brandl, 2002, p. 88).

Within the English for Professional Purposes course, offered at Potchefstroom University, the strategic reading instruction component consisted of the following: a printed interactive study guide, contact sessions (face-to-face), and the technology-enhanced feature, namely Varsite (i.e., a Learning Content Management System). Varsite was designed and developed by computer specialists at Potchefstroom University. The aim of this format was to try to ensure that we accommodated the learning style preferences of the majority of the students taking this course.

2.1. Interactive study guides

At Potchefstroom University printed interactive study guides are compulsory for all full time courses on campus. The authors of the strategic reading study guide tried to obtain a balance among three aspects: (1) the core information (i.e., the content on strategic reading), (2) the tasks and activities for learners to actively
interact with the various sections of the module in order to develop the application of knowledge and skills in terms of the outcomes, and (3) encouragement of learners to manage their own learning (cf. Harden et al., 1999; Van der Merwe et al., 2002).

The major focus in the study guide was on explaining the main features of a particular strategy and explaining why that strategy should be learned (i.e., the potential benefits of use). The benefit of use was linked to students' reading profiles. In this way, students could see the necessity of reading strategy use, as well as the link to their reading comprehension ability. Appendix A contains an outline of the content of the study guide, as well as the outcomes formulated for the strategic reading component. In the study guide, the following aspects formed a minor focus: (1) how to use the strategy, (2) when and where the strategy should be used, and (3) how to evaluate the use of the strategy (Anderson, 1991; Paris et al., 1984; Winograd and Hare, 1988). The study guide, therefore, contained sufficient explanation about strategic reading, but only a few practice activities.

2.2. Contact sessions

The purpose of the contact sessions (three per week) was to give the students additional information on the strategies, to model the strategies for the students, and to provide practice opportunities both individually and in groups. During the first two sessions, the students were given information on the importance of motivation, anxiety, and time management because of the important role these variables play in language learning (cf. Dreyer, 1995; Dreyer and Oxford, 1996; Oxford and Ehrman, 1993). In addition, the students and the lecturers brainstormed on reading strategies, and they discussed their prior experience with the use of reading strategies and the rationale for using them. At first, the discussion was linked to general topics (e.g., reading magazines, short stories, cookbooks, maps, etc.) and then specifically to content in their major (e.g., mass communication, non-verbal communication, communication theories, etc.).

During the contact sessions, a brief overview was given of what a strategy is and why it should be used (i.e., minor focus). The major focus during the contact sessions was on how to use the strategies, when and where to use them, and how to evaluate their use (cf. Anderson, 1991; Paris et al. 1984; Winograd & Hare 1988). The authors tried to build from the student's understanding of whatever strategies he/she was currently using to placing these strategies in question by testing their validity.
against the task demands placed upon them by higher education. During the course of
the 13-week semester, the students were given the opportunity to practise with simple
sentences, then with paragraphs, then with a variety of genres, and lastly, with the
content of their major (i.e., Communication Studies). Students were also shown how
to set a purpose for their reading and how to approach the reading of different texts
(e.g., narrative versus expository).

2.3. Varsite

Varsite is a Learning Content Management System (LCMS). A LCMS is a
multi-user environment where lecturers can create, store, reuse, manage, and deliver
digital learning content from a central object repository. A LCMS contains four basic
elements: (1) a dynamic delivery interface (providing links to related sources of
information, resources, the electronic study guide, and supports assessment with user
feedback), (2) an automated authoring system (used to create the reusable learning
objects that are accessible in the repository), (3) an administrative system (used to
manage student records, track and report student progress, and provide other basic
administrative functions), and (4) the learning object repository (serving as a central
database in which learning content is stored and managed, and made accessible to the
learners). The delivery interface and homepage of the strategic reading component of
the English for Professional Purposes course is given at Figure 1.

The students had access to the following features within the Varsite
environment: (1) electronic study guide, (2) announcement section, (3) assignment
and resource section, (4) assessment section, and (5) interaction with peers and
instructors. Each of these is described below.

The electronic study guide differed from the printed interactive study guide in
that it contained only the main points of emphasis on the reading process and the
various reading strategies. It did not contain detailed explanations or examples. The
purpose of the electronic study guide was to provide a quick reference for students
while they were completing tasks that required them to follow a number of
hyperlinks. For example, if the students wanted to know about text structure they
could simply click on the study guide link and they would be taken to the relevant
page in the electronic study guide.
The second feature was the announcement section. Here, the lecturers informed the students on a daily basis of assignments that had to be completed as well as due dates.

In the assignment and resource section students were given a detailed outline of the tasks to be completed; the resource section contained two sub-sections, one on general topics and one specifically for Communication Studies. The resource section also contained a number of hyperlinks that were updated on a weekly basis to ensure that students had access to a plethora of information on the specific topics being discussed in their Communication Studies class. The English lecturers coordinated their teaching schedules with that of the Communication Studies lecturer. During the first seven weeks of the semester, the lecturers provided the students with a variety of generic topics (e.g., current news, music, business reports, etc.), as well as a number of hyperlinks (i.e., scaffolding) that they had to use in order to gain access to the information needed for the completion of the tasks. During the last six weeks of the semester, the students were allowed to “surf” the Internet on their own, with only limited guidance from the lecturers, in order to find the information needed to complete the assignments. The assignments focussed on the use of reading strategies (e.g., predict what information the following website will contain; formulate a number of questions you want answered after reading an article on non-verbal communication, etc.).

The fourth feature, the assessment section, was used in order to set a number of online practice assessments. Students had to make use of a variety of reading strategies in order to complete the assessments (e.g., identify the purpose of a selected piece of text, identify the main idea, make inferences, predict, formulate questions, summarise, etc.).

The fifth feature was interaction with fellow students and also with the lecturers. This was accomplished via email.

In general, the Varsite environment exposed students to a variety of authentic information that increased their background knowledge and comprehension of topics they were also discussing in their Communication Studies class (e.g., small groups, conflict in small groups, etc.). Some of the sites included video and audio clips (e.g., interviewing, negotiation skills, etc.). Initially, the activities and tasks were lecturer-guided, but as the students gained confidence, they were allowed to make their own
choices. The rationale for using selected readings from the Internet was to surpass what the lecturers could offer in the contact sessions.
Figure 1: Delivery Interface and Homepage of the Strategic Reading Instruction Component
3. Research method

3.1. Design

A quasi-experimental non-randomized pre-test post-test control group design was used.

3.2. Participants

All first-year English as a Second Language (ESL) students (n=131) taking the English for Professional Purposes course participated in this study. The participants included speakers of Afrikaans and Setswana majoring in Communication Studies. Within the experimental and control groups, the students were divided into two additional groups, namely successful and unsuccessful or “at risk” for failure. The students were divided into these two groups based on their scores for reading comprehension tests in English, Communication Studies and the TOEFL. All those students who obtained percentages below 55% were categorised as “at risk,” whereas the students who obtained percentages above 55% were categorised as “successful”.

3.3. Instrumentation

The following instruments were used in this study:

- A Reading Strategies Questionnaire, based on the work of Oxford (1990), Pressley and Afflerbach (1995), Pressley et al. (1995) and Wyatt et al. (1993), was used to determine students’ use of reading strategies (cf. Chapter 3 for a detailed outline).

- The TOEFL test was administered to determine the English proficiency of the students. The test consists of three sections that are separately timed: Listening comprehension, Structure and Written expression and Vocabulary and Reading comprehension (reliability analyses r=0.96 for total scores, N=215).

- Two reading comprehension tests, one within Communication Studies (drawn up in consultation with the lecturer teaching the specific Communication module) and one within the English for Professional Purposes course, were used as a pre-test together with the reading comprehension section of the TOEFL in order to classify the students as “at risk” of failure or as “successful”. Similar tests were used for post-test purposes.
With regard to the reading comprehension tests, a combination of multiple-choice and short answer comprehension questions designed to tap higher-order reading skills were prepared (e.g., relating information, generalising, noting similarities, differences and contradictions, paraphrasing, making applications and cause-effect relationships). The length of the English reading comprehension passages were much shorter than that of the Communication Studies reading comprehension passages. For the Communication reading comprehension test, articles used by the lecturer in the Communication Studies course provided students with the opportunity to read specific content material in a format that they would encounter in their Communication Studies course.

3.4. Data collection procedure

The questionnaires were completed in scheduled contact session periods within the first two weeks of the second semester of 2002. All questionnaires were completed under testing conditions. The TOEFL test was completed under test conditions as specified by Educational Testing Services. All background information on the students was obtained from the university academic administration.

3.5. Analysis

T-tests were used to determine if there were differences in the mean scores of first-year students on selected variables. Cohen’s effect size $d$ was used to determine if the mean differences were practically significant. Cohen (1977) uses the following scale for the $d$ values:

- $d=0.2$ (small effect size)
- $d=0.5$ (medium effect size)
- $d=0.8$ (large effect size)

4. Results

An analysis of the reading comprehension scores (pre-test) of the students in the experimental and control groups indicated that there was not a statistically significant difference in their mean scores on any of the reading comprehension measures (cf. Table 1). The language proficiency scores, as measured by the TOEFL, of the students in both groups ranged from 400-599. These scores indicate that some of the students’ proficiency levels can be considered to be too low for academic work.
A closer analysis of the TOEFL scores indicated that the at-risk students in this study achieved the lowest score in the reading section of the TOEFL test. This is a major cause for concern, especially when one considers that students need to read and comprehend a large number of academic texts.
**Table 1: The reading comprehension profile of first-year students: Experimental group vs Control group**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Experimental (Pre-test) (N=89)</th>
<th>Control (Pre-test) (N=42)</th>
<th>Experimental (Post-test) (N=89)</th>
<th>Control (Post-test) (N=42)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>English reading comprehension</td>
<td>58.40</td>
<td>6.25</td>
<td>57.07</td>
<td>4.44</td>
</tr>
<tr>
<td>Communication reading comprehension</td>
<td>57.95</td>
<td>5.52</td>
<td>56.23</td>
<td>2.63</td>
</tr>
<tr>
<td>TOEFL reading comprehension</td>
<td>25.19</td>
<td>6.17</td>
<td>25.85</td>
<td>4.90</td>
</tr>
<tr>
<td>TOEFL total (Score range)</td>
<td>400-599</td>
<td>400-599</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Key:**

**Statistical significance**

*** \( p < 0.0001 \)

**Practical significance**

\( d = 0.2 \) (small effect size)

\( d = 0.5 \) (medium effect size)

\( d = 0.8 \) (large effect size)
In the English for Professional Purposes course offered at Potchefstroom University, 30.53% of the students enrolled in this course were identified as being “at risk” for failure or unsuccessful (cf. section 4.2). The mean pre-test reading comprehension scores, on the English, Communication and the reading section of the TOEFL test, for the at-risk students were all below 55% (cf. Table 2). The results indicated that the at-risk students differed statistically \((p<0.0001)\), as well as practically significantly \((d\geq0.8)\) (cf. Table 2), from the successful students on all the reading comprehension measures.

In terms of reading strategy use (pre-test), the results indicated that there was not a statistically significant or a practically significant difference in the reading strategies used by the students in the experimental and control groups (cf. Table 3). The post-test results, however, indicated that the students in the experimental group used certain strategies statistically \((p<0.05)\), as well as practically significantly (small to large effect sizes), more often than the students in the control group (cf. Table 3).
Table 2: The reading comprehension profile of first-year students: Successful vs At-risk

<table>
<thead>
<tr>
<th>Variables</th>
<th>Successful (Pre-test) (N=91)</th>
<th>At risk (Pre-test) (N=40)</th>
<th>Successful (Post-test) (N=91)</th>
<th>At risk (Post-test) (N=40)</th>
</tr>
</thead>
<tbody>
<tr>
<td>English reading comprehension</td>
<td>60.54 ± 4.34</td>
<td>52.12 ± 4.01</td>
<td>*** p&lt;0.0001</td>
<td>65.56 ± 5.51</td>
</tr>
<tr>
<td>Communication reading comprehension</td>
<td>59.40 ± 4.27</td>
<td>52.85 ± 2.35</td>
<td>*** p&lt;0.0001</td>
<td>63.82 ± 5.70</td>
</tr>
<tr>
<td>TOEFL reading comprehension</td>
<td>28.21 ± 2.98</td>
<td>19.00 ± 5.52</td>
<td>*** p&lt;0.0001</td>
<td>32.98 ± 4.47</td>
</tr>
<tr>
<td>TOEFL total (Score range)</td>
<td>500-599</td>
<td>400-499</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Key:

Statistical significance

*** p<0.0001

Practical significance

d=0.2 (small effect size)
d=0.5 (medium effect size)
d=0.8 (large effect size)
Table 3: The reading strategy use profile of first-year students: Experimental vs Control

<table>
<thead>
<tr>
<th>Variables</th>
<th>Experimental (Pre-test) (N=91)</th>
<th>Control (Pre-test) (N=40)</th>
<th>Experimental (Post-test) (N=91)</th>
<th>Control (Post-test) (N=40)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>I briefly skim the text before reading.</td>
<td>2.97</td>
<td>0.67</td>
<td>2.99</td>
<td>0.56</td>
</tr>
<tr>
<td>I skim/scan to get the main idea.</td>
<td>2.99</td>
<td>0.75</td>
<td>3.02</td>
<td>0.71</td>
</tr>
<tr>
<td>I pay greater attention to important information than other information.</td>
<td>2.67</td>
<td>0.54</td>
<td>2.66</td>
<td>0.56</td>
</tr>
<tr>
<td>I try to relate the important points in the text to one another in an attempt to understand the entire text.</td>
<td>2.36</td>
<td>0.64</td>
<td>2.43</td>
<td>0.65</td>
</tr>
<tr>
<td>I generate questions about the text.</td>
<td>1.78</td>
<td>0.70</td>
<td>1.70</td>
<td>0.68</td>
</tr>
<tr>
<td></td>
<td>2.23</td>
<td>0.54</td>
<td>2.17</td>
<td>0.56</td>
</tr>
<tr>
<td>------------------------------------------------------------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>While I am reading, I reconsider and revise my prior questions about the text based on the text's content.</td>
<td>1.74</td>
<td>0.56</td>
<td>1.80</td>
<td>0.60</td>
</tr>
<tr>
<td>I plan how I am going to read a text.</td>
<td>2.10</td>
<td>0.68</td>
<td>2.07</td>
<td>0.64</td>
</tr>
<tr>
<td>I often look for how the text is organised and pay attention to headings and sub-headings</td>
<td>2.54</td>
<td>0.76</td>
<td>2.49</td>
<td>0.72</td>
</tr>
<tr>
<td>I usually make predictions as to what will follow next.</td>
<td>1.98</td>
<td>0.50</td>
<td>2.00</td>
<td>0.54</td>
</tr>
<tr>
<td>While I am reading, I try to determine the meaning of unknown words that seem</td>
<td>2.02</td>
<td>0.48</td>
<td>2.10</td>
<td>0.52</td>
</tr>
<tr>
<td>Action</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>I try to underline when reading in order to remember the text.</td>
<td>3.45</td>
<td>0.76</td>
<td>3.39</td>
<td>0.70</td>
</tr>
<tr>
<td>I read material more than once in order to remember the text.</td>
<td>3.10</td>
<td>0.68</td>
<td>2.98</td>
<td>0.74</td>
</tr>
<tr>
<td>I make notes when reading in order to remember the text.</td>
<td>2.68</td>
<td>0.65</td>
<td>2.60</td>
<td>0.70</td>
</tr>
<tr>
<td>When appropriate, I try to visualize the descriptions in the text that I am reading in order to remember the text.</td>
<td>2.14</td>
<td>0.53</td>
<td>2.19</td>
<td>0.59</td>
</tr>
<tr>
<td>I summarize/paraphrase the material that I am reading in order to remember the text.</td>
<td>3.54</td>
<td>0.64</td>
<td>3.57</td>
<td>0.65</td>
</tr>
<tr>
<td>When reading, I ask myself questions about the text</td>
<td>2.00</td>
<td>0.45</td>
<td>1.99</td>
<td>0.50</td>
</tr>
</tbody>
</table>
content to better remember the text.

<table>
<thead>
<tr>
<th></th>
<th>2.41</th>
<th>0.69</th>
<th>2.37</th>
<th>0.71</th>
<th>3.82</th>
<th>0.68</th>
<th>3.48</th>
<th>0.63</th>
<th>*</th>
<th>0.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>When I think that I am not comprehending a text, I change my reading strategies (e.g. re-reading).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>As I am reading, I evaluate the text to determine whether it contributes to my knowledge/understanding of the subject.</td>
<td>2.32</td>
<td>0.52</td>
<td>2.34</td>
<td>0.54</td>
<td>3.44</td>
<td>0.56</td>
<td>3.38</td>
<td>0.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After I have read a text, I review it.</td>
<td>3.34</td>
<td>0.62</td>
<td>3.39</td>
<td>0.69</td>
<td>3.42</td>
<td>0.53</td>
<td>3.34</td>
<td>0.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After I have read a text, I try to interpret what I have read.</td>
<td>2.89</td>
<td>0.76</td>
<td>2.80</td>
<td>0.79</td>
<td>3.58</td>
<td>0.64</td>
<td>3.37</td>
<td>0.57</td>
<td>*</td>
<td>0.32</td>
</tr>
<tr>
<td>After I have read a text, I evaluate what I have read.</td>
<td>2.35</td>
<td>0.67</td>
<td>2.20</td>
<td>0.69</td>
<td>3.80</td>
<td>0.68</td>
<td>3.43</td>
<td>0.71</td>
<td>*</td>
<td>0.52</td>
</tr>
<tr>
<td>While reading, I jump forward and/or backward in</td>
<td>2.10</td>
<td>0.49</td>
<td>2.16</td>
<td>0.53</td>
<td>3.52</td>
<td>0.76</td>
<td>3.37</td>
<td>0.57</td>
<td>*</td>
<td>0.20</td>
</tr>
</tbody>
</table>
I vary my reading style depending on my reading goals.

<table>
<thead>
<tr>
<th></th>
<th>1.98</th>
<th>0.54</th>
<th>2.00</th>
<th>0.56</th>
<th>3.09</th>
<th>0.69</th>
<th>2.76</th>
<th>0.52</th>
<th>*</th>
<th>0.48</th>
</tr>
</thead>
<tbody>
<tr>
<td>After I have read a text I summarise it.</td>
<td>3.54</td>
<td>0.71</td>
<td>3.50</td>
<td>0.69</td>
<td>3.62</td>
<td>0.58</td>
<td>3.52</td>
<td>0.57</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Key

**Statistical significance**

* p<0.05

**Practical significance**

d=0.2 (small effect size)
d=0.5 (medium effect size)
d=0.8 (large effect size)
From the results presented above, it seems clear that the first-year students in this study who have problems with reading comprehension and do not use reading strategies optimally and strategically come unprepared for the academic literacy requirements that typically characterise university coursework (cf. Pugh et al., 2000), and that may very well be a part of their upcoming job responsibilities (cf. South African Department of Education, 1997).

An analysis of the strategies that discriminated between the students revealed that there was a difference in terms of the processes that occurred before reading, during reading, and after reading (cf. Caverly et al., 2000). The successful students in this study were active during all three phases of reading (post-test). Only the strategies where significant differences occurred are reported (cf. Table 4). The strategy use of the at-risk students, on the other hand, indicated that they lack sufficient, efficient, and effective strategically orchestrated use of the necessary higher order processes (i.e., metacognitive strategies), which would enable them to assess the different reading tasks and bring to bear the necessary strategies for their completion. The at-risk students mainly used metacognitive strategies that related to planning, whereas the successful students also seemed to monitor and evaluate their learning and reading comprehension. The successful readers, as reflected by the reading comprehension scores, were goal-directed, dealt with comprehension difficulties at several levels of analysis, and worked explicitly towards creating and retaining a lasting representation of the important points of the text.
**Table 4: The reading strategy use profile of first-year students: Successful vs At-risk (Post-test)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Experimental (At-risk) (N=25)</th>
<th>Control (At-risk) (N=15)</th>
<th>Experimental (Success) (N=64)</th>
<th>Control (Success) (N=27)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>I briefly skim the text before reading.</td>
<td>3.45</td>
<td>0.68</td>
<td>2.89</td>
<td>0.62</td>
</tr>
<tr>
<td>I relate important points in the text to one another.</td>
<td>3.79</td>
<td>0.72</td>
<td>2.52</td>
<td>0.60</td>
</tr>
<tr>
<td>I generate questions about the text.</td>
<td>3.56</td>
<td>0.66</td>
<td>2.77</td>
<td>0.59</td>
</tr>
<tr>
<td>While I am reading, I reconsider and</td>
<td>2.96</td>
<td>0.47</td>
<td>2.38</td>
<td>0.45</td>
</tr>
</tbody>
</table>
I revise my prior questions about the text based on the text's content.

<table>
<thead>
<tr>
<th></th>
<th>3.59</th>
<th>0.57</th>
<th>3.29</th>
<th>0.55</th>
<th>*</th>
<th>0.53</th>
<th>3.65</th>
<th>0.73</th>
<th>3.35</th>
<th>0.69</th>
<th>*</th>
<th>0.41</th>
</tr>
</thead>
</table>

I plan how I am going to read a text.

<table>
<thead>
<tr>
<th></th>
<th>2.70</th>
<th>0.48</th>
<th>2.00</th>
<th>0.42</th>
<th>*</th>
<th>1.46</th>
<th>2.85</th>
<th>0.64</th>
<th>2.05</th>
<th>0.60</th>
<th>*</th>
<th>1.25</th>
</tr>
</thead>
</table>

I usually make predictions as to what will follow next.

<table>
<thead>
<tr>
<th></th>
<th>3.40</th>
<th>0.60</th>
<th>2.91</th>
<th>0.57</th>
<th>*</th>
<th>0.82</th>
<th>3.31</th>
<th>0.71</th>
<th>3.35</th>
<th>0.73</th>
<th>n.s.</th>
</tr>
</thead>
</table>

When appropriate, I try to visualize the descriptions in order to remember.
<p>| | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>When I don't comprehend, I change my reading strategies (e.g.</td>
<td>3.77</td>
<td>0.68</td>
<td>3.21</td>
<td>0.63</td>
<td>*</td>
<td>0.82</td>
<td>3.86</td>
<td>0.80</td>
<td>3.52</td>
</tr>
<tr>
<td>re-reading).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After I have read a text, I evaluate what I have read.</td>
<td>3.60</td>
<td>0.69</td>
<td>3.38</td>
<td>0.62</td>
<td>*</td>
<td>0.32</td>
<td>3.89</td>
<td>0.78</td>
<td>3.49</td>
</tr>
<tr>
<td>I try to anticipate information in the text.</td>
<td>3.00</td>
<td>0.52</td>
<td>2.74</td>
<td>0.48</td>
<td>*</td>
<td>0.50</td>
<td>3.23</td>
<td>0.70</td>
<td>2.92</td>
</tr>
<tr>
<td>As I read along, I check whether I anticipated information</td>
<td>2.91</td>
<td>0.48</td>
<td>2.24</td>
<td>0.42</td>
<td>*</td>
<td>1.40</td>
<td>3.02</td>
<td>0.67</td>
<td>2.39</td>
</tr>
<tr>
<td>correctly.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
I set goals for reading.

| I evaluate whether what I am reading is relevant to my reading goals. | 3.50 | 0.73 | 3.24 | 0.67 | * | 0.36 | 3.59 | 0.76 | 3.33 | 0.65 | * | 0.34 |
| I vary my reading style depending on my reading goals. | 3.66 | 0.61 | 3.41 | 0.58 | * | 0.41 | 3.60 | 0.67 | 3.24 | 0.63 | * | 0.54 |

Key

Statistical significance

* p<0.05

Practical significance

d=0.2 (small effect size)
d=0.5 (medium effect size)
d=0.8 (large effect size)
After participating in the 13-week strategic reading instruction component of the English for Professional Purposes course offered in a technology-enhanced environment the following results were obtained:

- The experimental group differed statistically, as well as practically significantly, from the control group on all the reading comprehension measures (post-test scores) (cf. Table 1).
- Similarly, the successful students also differed statistically, as well as practically significantly, from the at-risk students on all the reading comprehension measures (post-test scores) (cf. Table 2).

A closer analysis of the reading comprehension scores (post-test) of successful and at-risk students in the experimental and control groups indicated that the successful students in the experimental group as well as the at-risk students in the experimental group achieved statistically (p<0.05), as well as practically significantly (small to large effect sizes), higher mean scores on the reading comprehension measures in comparison to the successful students as well as the at-risk students in the control group (cf. Table 5). A positive aspect related to the results is the fact that the at-risk students in the experimental group showed a significant increase in both their reading comprehension scores and in their use of reading strategies. It also seemed as if they were starting to pay attention to the metacognitive aspects of their reading (e.g., “After I have read a text, I evaluate what I have read”, “When I don’t comprehend, I change my reading strategies”).
It is also possible that the students’ comprehension of content knowledge and concepts (i.e., related to Communication Studies) was facilitated through graphic illustrations on the web pages, which helped to consolidate and concretize abstract content-based concepts by encouraging multi-modal processing of both visual and verbal cues as presented on the Internet page. This aspect would, therefore, have accommodated those students with a visual learning style. Similar studies conducted with first-year students at Potchefstroom University have indicated that the at-risk students tend to have visual learning styles which are rarely accommodated in teacher and lecture-dominated classrooms (cf. Dreyer, 1998, 2001). It is also possible that the Internet hypertext facilitated students’ learning of new information by providing access to multiple cross-references on related topics across several documents or screens, enabling a natural juxtaposition of ideas, and allowing students the freedom to access and explore these ideas at their own time and leisure without the pressure of, “I have to know this information for a test in the Communication Studies class”. At the beginning of the Strategic Reading component of the English course, the students were told that this component was meant to help them become effective and efficient readers for their academic majors. The attitude and the motivation of the students was very positive and the majority wanted more periods for this component. The motivational aspect can, therefore, not be ignored in the interpretation of the results.

5. Conclusion

The present findings suggest that students benefit from strategic reading instruction offered in a technology-enhanced learning environment. The integrated features of the printed interactive study guide, contact sessions with the lecturer and the added value aspect of Varsite appears to have facilitated the development of students’ reading comprehension and reading strategy use. The students who accessed the information technology resources available on Varsite have immediate access to a far wider variety of texts than is available in the university library. The students can also access these resources at their own time and within the comfort of their own rooms at the residence or at home. University students need to recognise more fully that developing and applying reading strategies could improve their reading comprehension in their content subjects and, therefore, also their academic performance.
However, students cannot be expected to acquire successful reading strategies incidentally, yet many come to our classes without a full realisation of what is expected of them. These students consequently continue to use inappropriate strategies with no awareness of the limitations of their habitual way of reading and learning or more productive options for completing academic tasks.

We must actively seek and share practices with colleagues that will help our students identify the obstacles that restrict their possibilities in university and equip all of the unique learners who fill our classes with the knowledge and strategies to take action towards transforming that which limits them.
Appendix A

Outcomes and an outline of the content of the interactive study guide

Outcomes

Students should be able to:

- Identify and plan the reading demands of the task;
- Formulate a purpose for their reading;
- Formulate appropriate questions to guide their reading;
- Select the most effective reading technique and reading rate for the identified purpose;
- Apply the most effective and efficient reading strategy/strategies to their reading;
- Read with comprehension at a level appropriate for first-year students;
- Monitor their comprehension; and
- Regulate their strategies if comprehension should break down.

Content

1. What is an active reader?
2. Reading purposes
3. Reading stances
4. Reading strategies as part of a reading process
   4.1 Asking beginning questions
   4.2 Setting a purpose by getting an overview or surveying
   4.3 Activating personal knowledge
   4.4 Making global predictions
   4.5 Read, check comprehension, reflect, think critically, monitor for difficulties and adjust
   4.6 Recite
   4.7 Review
4. Reading strategies in action
   5.1 Before reading
   5.2 During reading
   5.3 After reading
References


Durkin, D., 1993. Teaching them to read. (6th ed.). Allyn & Bacon, Boston, MA.


Wyatt, D., Pressley, M., El-Dinary, P., Stein, S., Evans, P., Brown, R., 1993. Comprehension strategies, worth and credibility monitoring, and evaluations: Cold and hot cognition when experts read professional articles that are important to them. Learning and Individual Differences 5, 49-72.
CHAPTER 3
An analysis of the reading profiles of first-year students at Potchefstroom University: A cross-sectional study and a case study

Abstract
Many South African students enter higher education under-prepared for the reading demands that are placed upon them. These students very often become part of the “revolving door syndrome”. An analysis of the reading assessment profiles of a group of first-year students at Potchefstroom University indicated that these students experienced problems across all aspects of the reading process (i.e., vocabulary, fluency, reading comprehension and reading strategy use). The reading assessment profiles of an efficient and an inefficient learner indicated that their profiles were diverse and that any one measure of reading achievement may not be sufficient to identify strengths and needs for instruction. Recommendations are made in terms of the reading support needed by these students.

Introduction
According to the South African government’s White Paper on Higher Education Transformation (Department of Education, 1997), student enrolment should be expanded and access should be broadened to reach a wider distribution of social groups and classes, including adult learners. This key recommendation is central to the framework underpinning the transformation of higher education in South Africa (Edrong, 2000). How higher education institutions have responded to these policy pressures varies across sub-sections and from institution to institution. However, there are indications that major improvements have occurred in student enrolment patterns in terms of race, gender and number (Harper & Cross, 1999; SABC, 2003). For example, Harper and Cross (1999) indicate that African student enrolments increased from 191 000 in 1993 to 332 000 in 1999, an increase of 74%.

These policies, although proactive, were not accompanied by adequate strategies to face the challenges that emanated from their implementation. We no longer have a homogenous group of students, possessing the fundamental skills necessary for higher education (cf. Harper & Cross, 1999; Van Wyk, 2001). Students from different social and cultural backgrounds, with different
experiences and varying levels of education bring with them different needs and academic potential (cf. Gardiner, 1994; Phillippe, 1995; Harper & Cross, 1999). A South African newspaper (Sunday Times, 23 July 2000) reports that at least 100 000 students drop out of tertiary institutions each year, and institutions have poor follow through rates (70% and below) and poor graduation rates (15% or below). A report submitted by the South African task team for the Council on Higher Education (Department of Education, 2000) states that institutions have to become accountable to taxpayers for the large amount of money that the government has spent on higher education, and that they have to answer to parents who spend their hard-earned money on tuition fees, only to see their children fail, drop out or leave unqualified for the jobs that the economy demands. One way of addressing this issue is by identifying (i.e., profiling) the learner variables that can affect the academic achievement of specifically first-year students in order to prevent them becoming part of the "revolving door syndrome".

Research indicates that a key, but often overlooked, skill that is essential to academic and professional success is reading ability (cf. Rings, 1994; Strydom, 1997; Pretorius, 2001). Reading is the skill upon which success in every academic area is based. According to Richardson et al. (1983) and Blue (1993), students at tertiary level are required to understand the overall content, distinguish main points from supporting detail, skim, scan, question, look for assumptions and intentions, analyse, synthesise and evaluate. However, research indicates that a small but significant number of first-year university students commence their studies with less than adequate reading comprehension abilities and reading strategy use (cf. Perkins, 1991; Strydom, 1997; Dreyer, 1998; Van Wyk, 2001; Falk-Ross, 2001/2002). Many first-year students, therefore, enter tertiary institutions unable to meet the expectations of the academic community (cf. Bartholomae & Petrosky, 1986; Strydom, 1997; Van Wyk, 2001; Pretorius, 2001).

The purpose of this article is to report on the reading assessment profiles of a group of first-year students at Potchefstroom University in order to a) determine the scope of the reading problem, b) assess the strengths and weaknesses of the reading assessment profiles of one efficient and one inefficient student (i.e., case study), and c) make recommendations in terms of the reading support needed by these students.
Reading at university
One of the biggest problems at university, but one which is often not fully recognised by either students or lecturers until some way into academic courses, is the problem of reading, perhaps because reading per se is not assessed. However, the results or outputs from reading are assessed. Reading for university courses is demanding. Some courses require 600 to 750 pages of reading each semester (Orlando et al., 1989). A typical first-year student (Faculty of Arts) at Potchefstroom University takes seven to eight modules (8 credits each) in the first semester (Potchefstroom University, 2002), each with extensive reading loads (approximately 600-1200 pages) serving several purposes.

Students, therefore, need to cope with a large quantity of reading in a limited amount of time. They need to use what they read for purposes such as absorbing, analysing and summarising information to use in writing or in seminars. They need to identify specific issues, questions or misunderstandings which they can raise in seminars, with subject tutors, or critique in oral presentations or in written work. They need to distinguish between facts and opinions, and make links between the known and what is speculation (cf. Carrell & Carson, 1997; Taraban et al., 2000). Taraban et al. (2000:284) state that: “In terms of cognitive processing, college reading is quite demanding considering the sheer amount, the range of topics, and the variety in the tasks”. The question is, therefore, whether first-year students have the reading skills to meet this challenge?

Components of a reading assessment profile
Reading assessment is used to gather data to understand students’ strengths and weaknesses in reading (Harris & Hodges, 1995). The information of tests of several components is then used to create profiles of students’ reading ability (cf. Chall, 1994; Chall & Curtis, 1990; Roswell & Chall, 1994; Strucker, 1997). Educators have traditionally used reading assessment to measure student growth in reading achievement and to diagnose individual strengths and weaknesses in reading in order to plan for instruction (Askov et al., 1997). Profiles result in a comprehensive view of students’ strengths and weaknesses across many aspects of the reading process and can be used to design a programme of instruction that addresses all aspects of the reading process during instruction. This ensures a balanced approach to reading instruction (National Reading Panel, 2000; Snow et al., 1998; Snow & Strucker, 2000). According to Kruidenier (2002), assessing
several components of reading in order to generate profiles of students’ reading ability give educators much more instructionally relevant information than any test of a single component can. In addition, the reading assessment profiles of English Second Language (ESL) learners may be so diverse that any one measure of reading achievement may not be sufficient to identify strengths, weaknesses and needs for instruction (Carver & Clark, 1998; Strucker, 1997).

The National Reading Panel (2000) identified four major components of reading instruction: alphabetics (phonemic awareness and word analysis), vocabulary, fluency and reading comprehension. In this study the focus is on three of the components, namely vocabulary, fluency and reading comprehension in order to obtain comprehensive reading assessment profiles of ESL first-year students. Alphabetics is not assessed because of its relevance for mainly beginning and intermediate readers (cf. Kruidenier, 2002).

Vocabulary
Vocabulary knowledge is fundamental to comprehending text (Nagy, 1998). Researchers distinguish between many different types of vocabularies. Receptive vocabulary is the vocabulary that we can understand when it is presented to us in text (i.e., reading vocabulary) or as we listen to others speak, while productive vocabulary is that vocabulary we use in writing or when speaking to others (i.e., oral vocabulary) (National Reading Panel, 2000: 4-15). The National Reading Panel (2000: 4-15) states that: “Oral vocabulary is a key to learning to make the transition from oral to written forms, whereas reading vocabulary is crucial to the comprehension processes of a skilled reader”.

Students must also learn to comprehend specific content-area information (West, 1978). Technical vocabulary includes words that relate specifically to each content-area subject or topic. Students must learn the definitions of these words to understand content-area reading text and to learn the language of the discipline. To promote comprehension, students need to develop an understanding of how words can be used across different contexts and be able to understand the meaning of words quickly while reading.

The ramifications of limited vocabulary knowledge include difficulties with reading and comprehending content-area text. The relationship between vocabulary knowledge and
comprehension is, however, extremely complex. Research shows that there is a strong positive correlation between vocabulary knowledge and comprehension (cf. Anderson & Freebody, 1981; Nagy et al., 1987; Beck & McKeown, 1991). It is possible, however, that this may be as a result of background knowledge, rather than isolated vocabulary recognition. Unless students have some relevant experiences (prior knowledge) to bring to a text, they are unlikely to be able to construct its meaning. The richer a student's background knowledge, the greater his or her potential for reading comprehension (Anderson & Pearson, 1984; Gaultney, 1995). Proficient readers acquire new words by wide reading and repeated exposures to words in varying contexts (Blachowicz & Fisher, 2000). Research also indicates that there is an equivocal relationship between teaching vocabulary and improving comprehension (Stahl & Fairbanks, 1986; Medo & Ryder, 1993; Tomeson & Aarnoutse, 1998).

Fluency and eye-movement analysis
Fluency in reading today is widely recognised as a critical need in terms of reading competency (cf. National Reading Panel, 2000; Kame’enui & Simmons, 2001). Harris and Hodges (1995) define fluency as “freedom from word identification problems that might hinder comprehension”. The development of fluent reading involves learning to look at each word more quickly or efficiently (National Reading Panel, 2000: 3-9).

Research on a student’s eye movements has provided a perspective from which to observe the fluent reading process (cf. Rayner & Duffy, 1988; Radach & Kempe, 1993; Rayner, 1998). A record of a student’s eye movements during reading provides objective evidence of his reading performance, or the way he/she habitually employs his/her eyes in reading.

Research into eye-movements in reading, conducted by a French ophthalmologist, Professor Emile Javal around 1879, revealed that rather than move in a continuous, sweeping motion, the eyes move in alternating jumps and pauses across a line of text. The jumping movements, called saccades, take approximately 20 milliseconds, while the pauses, called fixations, last approximately 150-300 milliseconds. The fixation can be considered the heart of the reading act, for it is during the fixation that perception takes place. The number of fixations is significant because it indicates the number of separate perceptions that must be made, sorted out, and added up to realise the meaning of the whole. Excess fixations and regressions (reverse fixations – eye
movements in a right-to-left direction) to recognise words results in the expenditure of more time and energy which in turn will reduce reading rate and inhibit ease and comfort in reading (Logan, 1997; National Reading Panel, 2000).

According to Taylor (2000), visual/functional efficiency, perceptual accuracy and word recognition automaticity, and information processing efficiency is a basic requirement for fluency in reading to emerge. It is essential that a student maintain both good binocular coordination and vergence (team use of both eyes), possess acceptable ocular motility (the ability to rotate the eyes and not the head) and track accurately (staying on the line and progressing sequentially across lines of print with good left to right directional attack) (Atzmon, 1993). Many struggling readers have difficulty moving to a level of automaticity and fluency that allows them to easily comprehend what they are reading (Hook & Jones, 2002). In essence, if word recognition is overly time consuming, and especially if multiple fixations are required to recognise words, there is little time and attention left to devote to the meaning of what is being read (LaBerge & Samuels, 1973; Lyon, 1995; Torgeson et al., 2001).

Research by McConkie and Rayner (1976) showed that the visual span of recognition is approximately 10 letter spaces. As a reader’s competence in word recognition grows, the average span of recognition will increase but typically not beyond one word or two (Rayner, 1986; McConkie & Zola, 1987). Poor readers, however, take in less with each fixation of the eyes on a text, and move backwards or skip words more often than good readers (National Reading Panel, 2000: 3-9).

The information processing capability of a student is highly dependent on the accuracy, speed and orderliness of the visual input process (Taylor, 2000). In usual silent reading, visual impressions are fed to the short-term memory three to five times per second. The ability of short-term memory to maintain and interpret the information is influenced by levels of attention and concentration, reading rate (time to receive visual information and store this in short-term memory) and the sequence of impressions (influenced by the nature of directional attack) which results in orderliness or lack of it in the word intake process as well as the ability to “chunk” information to decrease the number of units to be held in short-term memory (cf. Taylor, 2000). A slow reader is more likely to read with little understanding, as his memory is taxed by the inability to retain
information in sufficiently large chunks to progress through the text with adequate retention of the content in the message (cf. Taylor, 2000).

Reading comprehension

Reading comprehension is often called the "essence of reading" (Durkin, 1993). In fact, all reading interactions culminate in comprehension. Comprehension is a "construction process" because it involves all of the elements of the reading process working together (Harris & Hodges, 1995:39). For comprehension to occur, words must be decoded and associated with their meanings in a reader's memory. Phrases and sentences must be processed fluently so that the meanings derived from one word, phrase or sentence are not lost before the next one is processed. The reader must construct a writer's message without the benefit of live conversation, relying only on what is derived from the text and the reader's own prior knowledge or past experiences (cf. Taraban et al., 2000). The reader must monitor this construction process, solving problems and making repairs as needed (cf. Snow et al., 1998). This involves the conscious use of reading comprehension strategies (cf. Van den Broek, 1994; Carrell, 1998; Nist & Holschuh, 2000).

Reading comprehension strategies are planned and purposeful tools that strategic readers use to draw meaning from text (cf. Ellis & Lenz, 1990; Pressley, 1999). Strategies help readers to engage with the text, to monitor their comprehension, and to fix comprehension when it has failed (cf. Paris et al., 1991; Pressley & Afflerbach, 1995; Mastropieri & Scruggs, 1997; Nist & Holschuh, 2000). There is consensus among researchers that skilled readers have a plan for comprehending; they use a variety of reading strategies effectively to monitor their own comprehension before, during and after they read (Ellis & Lenz, 1990; Anderson, 1991; Carrell, 1998; Salembier, 1999). There is ample research evidence supporting the efficacy of strategy training during reading as a means to enhance students' comprehension (Pressley et al., 1989; Rosenshine et al., 1996; Dreyer, 1998; Taraban et al., 2000).

South African research indicates a bleak picture with regard to the reading comprehension levels of our students (cf. Blacquiere, 1989; Perkins, 1991; Pretorius, 2000; 2001; Dreyer & Nel, 2003). Orndorff (1987) states that the inability of many students to read critically and with comprehension may be the single most important problem in tertiary education. Not only do students have difficulty selecting authors' main ideas and seeing how they have been developed
into a coherent whole, but they are also unable to infer, synthesise and restructure ideas, especially from complex texts (cf. Sager, 1989; Brigham et al., 1995; Deshler et al., 1996; Pretorius, 2000; 2001; Dreyer & Nel, 2003).

Research, therefore, seems to indicate that students who have problems with reading comprehension and do not use reading strategies optimally come unprepared for the expectations of the academic community and that typically characterise university coursework (cf. Pugh et al., 2000), and that may very well be a part of their upcoming job responsibilities (cf. Department of Education, 1997; Kasper, 2000).

Method of research

Design

A one-shot cross-sectional survey and case design was used.

Participants

A total of sixty-two (n=62) randomly selected students taking the first-year English for Professional Purposes course (N=131) participated in this study. Students studying both full-time and part-time were included in the study. The age of the students ranged from 18-22 years. The participants included speakers of Afrikaans and Setswana majoring in Communication Studies (N=42) and Psychology (N=20).

Instrumentation

The following instruments were used in this study:

- The vocabulary component of the ELSA Plus test for Higher Education and Training (Business Enterprises, 2002) was used to measure the receptive vocabulary (i.e., the vocabulary we can understand when it is presented to us in text) of the students. The vocabulary component consisted of 30 multiple-choice items.
- The Communication Vocabulary Test was used to test the students’ Communication content-specific vocabulary. This test was devised by the researcher in consultation with the Communication Studies lecturer. The test consisted of 15 multiple-choice items and 15 give-the-meaning items. The test had content and face validity.
- The Psychology Vocabulary Test was used to test the students’ Psychology content-specific vocabulary. This test was devised by the researcher in consultation with the
Psychology lecturer. The test consisted of 15 multiple-choice items and 15 give the meaning of items. The test had content and face validity.

- The Visagraph II eye-movement recording system was used to measure the efficiency of the fundamental reading process of students: visual/functional proficiency (visual coordination, ocular motility and precision in tracking), perceptual development (accuracy in visual discrimination and word recognition automaticity) and information processing competence (efficiency in the use of short-term memory and language experience) (cf. Taylor, 2000).

- Section III of the TOEFL test, namely the Vocabulary and Reading Comprehension section, was administered to determine the vocabulary and reading comprehension of the students. (Educational Testing Service, 1989). The vocabulary and reading comprehension section measures the ability to understand nontechnical reading material and the contextual meaning of words; it is divided into two parts. Each reading comprehension passage is followed by a series of questions about the main and secondary ideas of the passage. For each vocabulary question, the student must choose the word or phrase that would best preserve the meaning of a given sentence if it were substituted for the underlined word(s) in that sentence. Section III consisted of 60 multiple-choice items.

- The Reading Performance Test in English: Advanced Level (Roux, 1996) was used to determine the students' reading performance level in English within the range of Senior Secondary Performance Levels (i.e., Grades 10, 11 and 12). The term “reading performance” in this context refers to the ability to get meaning from print (i.e., reading comprehension). This standardised test consists of 50 items. Questions are based on prose passages, advertisements, a film review, a cartoon and two cloze-test passages. All the questions are in multiple-choice form consisting of four options per item. The raw scores of the students were converted to a stanine scale. The stanine scale is a nine-point standard scale according to which raw scores are divided into nine intervals. It provides standard scores ranging from 1 (very poor) to 9 (very good) with a mean of 5 and a standard deviation of 1.96. The norms for second language speakers are specified in Roux (1996: 22).

- A Reading Strategies Questionnaire, based on the work of Oxford (1990), Pressley and Afflerbach (1995), and Pressley et al. (1995), was used to determine students' use of reading strategies. The reading questionnaire was divided into three sections:
Part A: Before reading strategies
Part B: During reading strategies
Part C: After reading strategies

Students answer in terms of how well a certain statement describes them. For example, a typical statement would be: “I briefly skim the text before reading”.

The student must then choose one of the following:

1. Never or almost never true of me
2. Usually not true of me
3. Somewhat true of me
4. Usually true of me
5. Always or almost always true of me

Each of the three parts is then summed to get the total for each part. The sum of each part is then divided by the number of items contained in each part in order to get the students’ average use of that particular group of strategies. The following guide was used to assess the frequency of strategy use:

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Always or almost always used</td>
<td>4.5-5.0</td>
</tr>
<tr>
<td></td>
<td>Usually used</td>
<td>3.5-4.4</td>
</tr>
<tr>
<td>Medium</td>
<td>Sometimes</td>
<td>2.5-3.4</td>
</tr>
<tr>
<td>Low</td>
<td>Usually not used</td>
<td>1.5-2.4</td>
</tr>
<tr>
<td></td>
<td>Never or almost never used</td>
<td>1.0-1.4</td>
</tr>
</tbody>
</table>

(Adapted from Oxford, 1990:300).

In addition to the above-mentioned questionnaires and tests, semi-structured interviews were conducted with the efficient learner and the inefficient learner. The purpose of the interviews was to determine the reading habits of the two students in terms of amount and variety as well as their knowledge of reading strategies.

Data collection procedure

The questionnaires were completed in scheduled contact session periods within the first two weeks of the second semester of 2002. All questionnaires were completed under testing conditions. The TOEFL test was completed under testing conditions as specified by Educational Testing Services. Special sessions were scheduled for testing students on the Visagraph at the Potchefstroom University reading laboratory. The two interviews were scheduled at a time convenient to both the primary researcher and the two students. All background information on the students was obtained from the university academic administration.
Visagraph recording functions
The student slips on goggles and they are adjusted to his/her inter-pupillary distance. The Visagraph requires no calibration or adjustment. A reading selection in the test booklet is then read silently. During the reading/recording, the Visagraph samples eye-movement positions 60 times per second and automatically computes various reading performance measures. Following this reading, a comprehension check determines whether or not the student read with reasonable comprehension.

Analysis
Descriptive statistics (i.e., means, standard deviations and percentages) were used to analyse the data. Pearson product-moment correlations were used to determine the direction and strength of the relationship between reading comprehension ability and academic performance in a course major (i.e., Communication Studies and Psychology). The interview data are reported as narratives.

Results and discussion
The results of this study are presented under the following headings:

- The scope of the reading problem
- Comparing two reading assessment profiles in terms of strengths and weaknesses

The scope of the reading problem
An analysis of the reading assessment profiles of the students participating in this study indicated that they experienced problems across all aspects of the reading components assessed (vocabulary, fluency, and reading comprehension and reading strategies) (cf. Table 1).

The mean score on the ELSA test was 14.66, indicating that the majority of the students in this study performed below the norm set for first-year students at the Potchefstroom University (cf. Table 1). The students majoring in Psychology achieved a mean score of 13.50 out of a potential maximum score of 30. The students majoring in Communication Studies obtained a mean score of 23.45 out of a potential maximum score of 30 (cf. Instrumentation section; Table 1). One reason for the difference between the mean scores of students majoring in Communication Studies and those majoring in Psychology may be the fact that Communication vocabulary, in general, is far more common than the Psychology vocabulary (i.e., greater exposure – television,
radio, newspapers, etc.). Research indicates that learning a word comes from multiple exposure over time in a variety of contexts (Ruddell, 1994). The ramifications of limited vocabulary knowledge, as revealed by these students, include difficulties with reading fluency and comprehending content area text. It is, therefore, important that instructional intervention be considered in order to help inefficient readers develop and apply vocabulary knowledge across a variety of contexts and to increase their repertoire of strategies for figuring out new vocabulary independently.

The fluency assessments indicated that the students performed below the norm required for first-year level on the following aspects: number of fixations, the average span of recognition of words, the average duration of fixations, reading rate and comprehension questions answered correctly (cf. Table 1). The results, therefore, indicated that the visual/functional proficiency of these students (i.e., their binocular coordination and vergence) is not what it should be for first-year students (cf. Table 1); there is a difference in the mean scores of the left eye and right eye in terms of the number of fixations and regressions. This indicates a lack of “teamwork” between the eyes and can affect the ease and comfort in reading. In addition, the results seem to indicate that the perceptual accuracy and word recognition automaticity of these students, as evidenced by the number of fixations per minute, and the average span and duration of recognition, is not what is expected for first-year students. In essence, if word recognition is overly time consuming there is little time and attention left to devote to the meaning of what is being read. Slowness in recognising words will, therefore, tend to increase the length of a student’s duration of fixation.

The students’ reading comprehension ability was also concerning. They obtained a mean raw score of 27 out of a potential maximum score of 60 on the Vocabulary and Reading Comprehension section of the TOEFL test, and their average stanine score on the Reading Performance Test was 5, indicating that their reading comprehension ability was “average” (cf. Table 1). This is roughly equal to a Grade 9 level (cf. Roux, 1996:20). Pearson product-moment correlations were calculated to determine the direction and strength of the relationship between the students’ reading comprehension ability, as measured by the Reading Performance Test, and their performance in their academic major, as measured by their first semester examination scores. A correlation of $r=0.81$ ($p<0.05$) was found between the reading comprehension scores of the students majoring in Communication Studies ($N=42$) and their performance in the
Communication examination. A correlation of $r=0.84\ (p<0.05)$ was found between the reading comprehension scores of the students majoring in Psychology ($N=20$) and their performance in the Psychology examination. Both these correlations are also practically significant ($r=0.5$) (cf. Cohen, 1977:77-81).

With regard to the frequency of their reading strategy use, the results indicated that the students only “sometimes used” before and after reading strategies. Their use of the “during reading” strategies group fell into the “usually used” category (cf. Table 1). On the whole, it seems as if this group of students has a very limited repertoire of reading strategies. An analysis of each strategy group indicated that with regard to the before reading, the students seldom activate prior knowledge, generate questions to guide their reading or identify a purpose for reading. During reading, the students’ main focus seems to be on identifying the main idea, underlining, making notes and paraphrasing. After reading, the students mainly focus on summarising and reviewing the text. The strategy results, therefore, seem to indicate that the students have a relatively poor knowledge base of reading strategies and lack metacognitive control.

<table>
<thead>
<tr>
<th>Instrumentation</th>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
<th>Norm for 1st year students</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VOCABULARY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ELSA Plus</td>
<td>Vocabulary</td>
<td>14.66</td>
<td>4.63</td>
<td>4</td>
<td>24</td>
<td>16</td>
</tr>
<tr>
<td>Communication Vocabulary Test</td>
<td>Communication content-specific vocabulary</td>
<td>23.45</td>
<td>3.24</td>
<td>13</td>
<td>28</td>
<td>-</td>
</tr>
<tr>
<td>Psychology Vocabulary Test</td>
<td>Psychology content-specific vocabulary</td>
<td>13.50</td>
<td>3.69</td>
<td>3</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td><strong>FLUENCY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visagraph</td>
<td>Fixations/100 words (Right eye)</td>
<td>105.08</td>
<td>20.89</td>
<td>68</td>
<td>134</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Fixations/100 words (Left eye)</td>
<td>104.78</td>
<td>21.95</td>
<td>51</td>
<td>134</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Regressions/100 words</td>
<td>13.72</td>
<td>10.56</td>
<td>1</td>
<td>33</td>
<td>15</td>
</tr>
<tr>
<td>TOEFL Section III (raw score converted to percentage)</td>
<td>Vocabulary and Reading Comprehension</td>
<td>27</td>
<td>5.23</td>
<td>22</td>
<td>54</td>
<td>-</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Reading Performance Test</td>
<td>Reading Comprehension</td>
<td>5</td>
<td>0.72</td>
<td>2</td>
<td>8</td>
<td>5 = Average 7 = Above average 8 = Good</td>
</tr>
<tr>
<td>Reading Strategies Questionnaire</td>
<td>Reading strategies: Before reading</td>
<td>2.77</td>
<td>0.49</td>
<td>1.80</td>
<td>4.17</td>
<td>High Usually used 3.5-4.4</td>
</tr>
<tr>
<td></td>
<td>Reading strategies: During reading</td>
<td>3.78</td>
<td>0.46</td>
<td>2.36</td>
<td>4.27</td>
<td>High Usually used 3.5-4.4</td>
</tr>
<tr>
<td></td>
<td>Reading strategies: After reading</td>
<td>2.59</td>
<td>0.60</td>
<td>1.24</td>
<td>3.78</td>
<td>High Usually used 3.5-4.4</td>
</tr>
</tbody>
</table>
Comparing two reading assessment profiles in terms of strengths and weaknesses

An analysis of the efficient student's reading assessment profile indicated that her profile is far flatter than that of the inefficient student; the efficient student has far fewer ups and downs in her profile than the inefficient student (i.e., the majority of the efficient student's mean reading assessment scores are scattered around or above the norm/guidelines for first-year students) (cf. Table 2, Appendix A, Appendix B).

The vocabulary assessments indicated that the efficient student had a score of 24 on the ELSA Plus test which is above the norm set for the first-year students at the Potchefstroom University. The inefficient student obtained a score of 16 on the ELSA Plus test indicating that her score was on par with the norm. The efficient student got a score of 26 out of a potential maximum of 30 for her Communication vocabulary test, whereas the inefficient student obtained a score of 7 out of a potential maximum of 30 on her Psychology vocabulary test. It is not really possible to compare the two content-specific vocabulary test scores because we are of the opinion that the vocabulary used in the Communication Studies course is far more common (e.g., television, newspaper, radio and magazine exposure) than that in the Psychology course. An analysis of the data recorded during the interviews indicated that the efficient student read far more frequently (daily) than the inefficient student (only when told to do so by the lecturer). The efficient student also read and/or skimmed/scanned a greater variety of texts (e.g., textbooks, articles, documents, websites, etc.). The possibility of the efficient student being exposed to new and more vocabulary words within a variety of contexts seems to be greater than that of the inefficient student. Although the relationship between vocabulary knowledge and comprehension is extremely complex (cf. Vocabulary section), there is little question that one component of proficient comprehension is the ability to cope with any unfamiliar words encountered during reading (cf. Caverly & Orlando, 1991).

A comparison of the fluency assessment profiles indicated that the efficient student was reading at a Grade 13.2 level (first-year level), whereas the inefficient student was reading at a Grade 6.9 level (cf. Appendix A and Appendix B). The reading level of the student is determined by the Visagraph system by taking the following aspects into consideration: fixations, regressions and reading rate with comprehension (words/min). The fluency profile of the efficient student
indicated the following strengths: fixations, regressions, average span of recognition and directional attack. The efficient student revealed weaknesses in the following areas: average duration of fixation (12% deviation from the grade norm) and his/her reading rate with comprehension (-7% deviation from the grade norm). The fluency profile of the inefficient student indicated weaknesses in the following areas: fixations (29% deviation from the grade norm), regressions (73% deviation from the grade norm), average span of recognition (-22% deviation from the grade norm), average duration of fixation (8% deviation from the grade norm), reading rate with comprehension (-29% deviation from the grade norm) and directional attack difficulty (7% deviation from the grade norm). The proficient student made relatively few fixation pauses and few regressions per line of print. This contrasted with the inefficient student who showed a relatively high frequency of fixations and regressions. The visual/functional proficiency as well as the perceptual accuracy of the inefficient student is below the norm required for first-year students. An analysis of the data recorded during the interviews indicated that the inefficient student had far greater difficulty getting through the required prescribed reading for her various modules than did the efficient student. This is particularly significant when one takes into consideration that the fluency assessment was done on a text of 100 words. It is, therefore, very possible that the reading fluency of this student may become progressively worse when confronted with a more demanding reading load. The results indicated that eye movement analysis can make a very significant contribution toward identifying students' basic fluency strengths and weaknesses. By making use of eye movement analysis it is possible to identify those students whose reading skills are not adequate to meet the reading demands required at first-year level. By using the Visagraph to analyse students' eye movements it is possible to prescribe and evaluate corrective instruction in the form of visual discrimination and reading fluency training. Knowledge about eye movement is important because this movement can reflect both cognitive processing and level of reading skill.

With regard to their reading comprehension assessment measure, the results indicated that the efficient student was reading at a Grade 12 level on the Reading Performance test, whereas the inefficient student was reading at a low average level (approximately Grade 7-8) (cf. Table 2). This finding seems to correlate with their reading rate with comprehension as measured by the Visagraph (cf. Appendix A and Appendix B). It is clear that the more efficient student, also the more fluent reader, read with greater comprehension than the inefficient student.
An analysis of the students’ frequency of reading strategy use indicated that there was a difference in terms of the processes that occurred before reading, during reading, and after reading (cf. Table 2). The efficient student was active during all three phases of reading. The strategy use of the inefficient student, on the other hand, indicated that she lacked sufficient and effective strategically orchestrated use of the necessary higher order processes (i.e., metacognitive strategies), which would enable her to assess the different reading tasks and bring to bear the necessary strategies for their completion. The results of the interviews indicated that the inefficient student typically failed to evaluate her understanding and apply strategies for adjusting her comprehension to different texts and purposes (e.g., I guess I know I didn’t understand when I get my test results back, and I failed). The inefficient student seemed to “stall” at the during reading stage, while the efficient student continued to process after reading by re-skimming to pinpoint important ideas and reflecting on the meaning of the passage or text. Thus, although the inefficient student has metacognitive knowledge about reading strategies, it seems to be much less elaborated than that of the efficient student. It is also possible that the systematic use of reading strategies, particularly metacognitive strategies, may be modulated not only by cognitive variables but also by affective and motivational variables (e.g., I always stress when I have to prepare for a test in this module; I don’t really know how to read/study for this module; I just need to pass this module).

Table 2: A comparison of an efficient and an inefficient reading assessment profile

<table>
<thead>
<tr>
<th>Instrumentation / Variable</th>
<th>Score/Average</th>
<th>Score/Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Efficient student</td>
<td>Inefficient student</td>
</tr>
<tr>
<td>ELSA Plus Vocabulary</td>
<td>24</td>
<td>16</td>
</tr>
<tr>
<td>Communication Vocabulary Test</td>
<td>26</td>
<td>-</td>
</tr>
<tr>
<td>Psychology Vocabulary Test</td>
<td>-</td>
<td>7</td>
</tr>
<tr>
<td>TOEFL Section III (raw score converted to percentage)</td>
<td>75%</td>
<td>40%</td>
</tr>
</tbody>
</table>
Conclusion and recommendations

Identification of the reading components that can have a potentially debilitating effect on academic performance is important at this point in the history of South African higher education. With the expanding of South African universities over the last few years to provide equal access for all, comes an increasing diversity of students' needs, skills and abilities. To embrace fully this equity initiative, universities must cater for this diverse student population and implement strategies and interventions based on sound research, to give all students a fair chance for academic success.

The results of this study, although conducted on relatively few students and based on the case study, indicated that students with different experiences and varying levels of education bring with them different needs and academic potential, specifically reading ability. The challenge for the Potchefstroom University, specifically, and for most South African universities, in general, is to recognise this diversity of reading needs and cater for this changing and heterogeneous population of students. The results also indicated a need for student reading support interventions. Specialised reading enhancement programmes need to be introduced and evaluated to provide students with the reading skills required to cope with first-year reading demands. Interventions could be aimed at highlighting the importance of the reading process for promoting academic achievement as an important part of integration into the university.

Based on a review of the literature and the results presented in this study, the following recommendations are made in order to support both efficient and inefficient first-year students with regard to the reading process:

<table>
<thead>
<tr>
<th>Reading Performance Test</th>
<th>Reading Comprehension</th>
<th>9</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Strategies Questionnaire</td>
<td>Reading strategies: Before reading</td>
<td>3.52</td>
<td>2.38</td>
</tr>
<tr>
<td></td>
<td>Reading strategies: During reading</td>
<td>4.45</td>
<td>4.24</td>
</tr>
<tr>
<td></td>
<td>Reading strategies: After reading</td>
<td>3.60</td>
<td>1.45</td>
</tr>
</tbody>
</table>
Lecturers at university, and specifically those responsible for teaching courses such as English for Academic/Professional Purposes, need to have knowledge of students' strengths and needs in reading in order to ensure the most effective instruction possible. Peterson et al. (2000:10) state that: “Educators should use the learners' reading strengths to approach and build the areas of difficulty”. Reading assessment profiles result in a comprehensive view of learner strengths and needs across all aspects of the reading process and should be used to design a programme of instruction that addresses all aspects of the reading process during instruction. This will ensure a balanced approach to instruction in which no one aspect of the reading process is over- or under-emphasised.

Lecturers should adopt a learning and learner-centred approach to teaching and learning. University students are, or should be, active participants in control of their learning; they are self-regulated, autonomous, and good strategy users. Common to all these labels is the operational definition of effective independent learners as those who plan, implement, and control the learning strategies that enhance learning. However, research indicates that most university students are not efficient and effective independent learners (Weinstein & Rogers, 1984; Dreyer & Bangeni, 2002), the most logical outcome for English for Academic/Professional Purposes courses would be to teach students a repertoire of reading strategies and tactics that will prepare them for the tasks and texts they encounter at university.

Research indicates that students have problems with transferring specific strategies to the particular academic literacy demands of each course. It is, therefore, recommended that a content-based approach be considered for English for Academic/Professional Purposes courses. The work of Kasper (1997; 2000; 2002) has reported both improved language and content performance among students exposed to content-based EAP programmes, higher scores on measures of reading proficiency, and higher pass rates on ESL courses. She also provides quantitative evidence that such students establish and retain a performance advantage over students exposed to non-content based EAP training. It is, therefore, the task of the lecturers to train students to be able to select, modify, monitor, evaluate and transfer a variety of strategies to their own learning tasks. To be effective independent learners, students need to be able to control and regulate the strategies they employ. Such control is a critical aspect of metacognition that involves learners in
planning, monitoring, and evaluating a plan of action across a variety of tasks and texts (Kluwe, 1987).

Electronic literacy now also counts among the basic skills necessary for success at university and within the workforce (cf. Warschauer, 1999). Finding ways to use technology to support course/module outcomes has, therefore, become increasingly important (cf. Falk-Ross, 2001/2002). According to Kasper (2000:109), content-based instruction "is inherently task-based, student-centred, and project-oriented and so offers a natural context for the integration of technology into instruction." It is recommended that the integration of technology into English for Academic/Professional Purposes courses be considered, specifically where reading is concerned. According to Taylor (2000), reading technology is the only direct and efficient means of developing fluency in silent reading.

Many first-year students underwent a secondary school experience that left them under prepared for the academic literacy demands of university learning. These students are often alliterate and suffer wide gaps in their prior knowledge, they are not generally prepared to read regularly, widely, or critically. It is possible that these students not only have problems with the ability to implement strategic reading or to draw upon metacognitive awareness, but that they also have deficiencies in conceptual background knowledge and reading vocabulary. It is also recommended that lecturers must provide experiences that immerse students in a) the "language of the academy", b) the advanced general vocabulary used by scholars as they communicate; and c) the specialised "languages of the disciplines" or those unique technical terms, symbols, etc. that permit scholars within a field to communicate effectively. Students must also understand that, learning these words means more than the rote memorisation of a brief definition; it implies conceptual understanding of words (Simpson & Dwyer, 1991). The focus of reading intervention programmes should be on multiple components instructions (all components of the reading process) that can lead to increased reading comprehension achievement and a strategic reading approach relevant to all academic courses.
References


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Appendix A: An efficient student’s fluency assessment profile

Reading Profile Visagraph version 4.2

<table>
<thead>
<tr>
<th>Grade/Goal</th>
<th>Grade</th>
<th>Left</th>
<th>Right</th>
<th>Norms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixations/100 words</td>
<td>83</td>
<td>83</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Regressions/100 words</td>
<td>5</td>
<td>4</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Av. Span of Recognition (words)</td>
<td>1.20</td>
<td>1.20</td>
<td>1.11</td>
<td></td>
</tr>
<tr>
<td>Av. Duration of Fixation (sec)</td>
<td>0.27</td>
<td>0.27</td>
<td>0.24</td>
<td></td>
</tr>
<tr>
<td>Rate with Comprehension (words/min)</td>
<td>260</td>
<td>280</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade Level Efficiency</td>
<td>19.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of Text Read</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Directional Attack Difficulty</td>
<td>8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate adj. for Rereading (words/min)</td>
<td>312</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comprehension Questions Correct</td>
<td>80%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross Correlation</td>
<td>0.939</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Countable lines in text: 10
Lines found: 10
Saccades in Return Sweeps: 13
Anomalies (Fix/Regr/Both): 2/0/2

Subject information
Name: Theron Carina
Class: 13
Sex: F
Grade: 13
Filename: THC-80-0.REC
Recorded: 04/24/2003 09:54
Directory: C:\WINVIS\rac

Text information
Filename: THC-80-0.REC
Title: Joho Holland 7-60
Answers: Y Y N Y Y Y Y N
No of questions: 10
Av. word length: 4.7

Countable part statistics
No of lines: 10
No of words: 100

Recording information
Total recording time: 28.15
Countable time: 25.00
Artifact time right eye: 0.00 (0%)
Artifact time left eye: 0.00 (0%)
Lines found: 10
Lines partially reread (> 30%): 2
Lines completely reread: 0
Comment: 12450545/7 B. Ed

Duration Standard Deviation: 84 ms
No. Saccade Start Diff. > 17 ms: 4
Events with Multiple Regressions: 0
Mean Regressions in Multiple Events: 

72
### Appendix B: An inefficient student’s fluency assessment profile

#### Reading Profile Visagraph version 4.2

<table>
<thead>
<tr>
<th>Grade/Goal</th>
<th>Grade</th>
<th>Left</th>
<th>Right</th>
<th>Norms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixations/100 words</td>
<td></td>
<td>115</td>
<td>116</td>
<td>90</td>
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- **Class:** 15
- **Sex:** F
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- **School:** Oppiwal
- **Examiner:** Joice Klapper
- **Filename:** LEK-86-0.REC
- **Recorded:** 04/24/2003 12:43
- **Directory:** C:\WINVISA\rec

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- **No of lines:** 10
- **No of words:** 100
- **Av. word length:** 4.7

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- **Countable time:** 39.22
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- **Lines partially reread (> 30%):** 0
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**Comment:** 12683174 / B.Ed
CHAPTER 4
Factors affecting students' acceptance and use of the technology-enhanced component of a strategic reading module

Abstract
We have entered an era in which technology is no longer an intimidating novelty. As the demand on faculty to design their English Second Language (ESL) courses for mixed mode delivery increases, the need to analyse the quality of these courses from the standpoint of both learner outcomes and learner acceptance and use grows more urgent. With the increased use of technology-enhanced courses on many campuses, it becomes important to facilitate student acceptance and use of computer technology. The students are crucial for the success or failure of the effective use of educational technology within ESL courses. The purpose of this article is to report on the factors that affect ESL students' acceptance and use of a technology-enhanced component (i.e., web-assisted) of a strategic reading module offered via mixed mode delivery, and to discuss the implications of the results for the designing of technology-enhanced courses as well as the support that should be given to the learners who must use the technology. The results indicated, based on qualitative and quantitative research, that computer self-efficacy, ease of use, enjoyment, outcome expectations, usefulness, and quality of resources are major factors affecting ESL students' acceptance and use of the technology-enhanced component of a strategic reading module.

Introduction
We have entered an era in which technology is no longer an intimidating novelty. Its use in business and industry is both accepted and expected (Willis, 1994; Daniel, 1997). Technology-enhanced courses form "a critical pressure point for challenging the dominant assumptions and characteristics of existing traditionally organized universities in the 21st century" (Hanna, 1998, p. 67). The result is that many contact universities are taking up the challenge, re-evaluating and restructuring the way educational programmes are designed and delivered to
students (Dreyer, 2001; Jordaan, 2001). According to Pajo and Wallace (2001), institutions that fail to do so may not survive.

With the increased use of technology-enhanced courses on many campuses, the need to analyse the quality of these courses from the standpoint of both learner outcomes and learner acceptance and use grows more urgent (Bayer Commission, 1998). Through our understanding of what students regard as being important in this changing teaching and learning environment, especially those brought on through the adoption of educational technologies, we can better plan, design and develop learning materials for appropriate delivery (Cameron, 2000). This may be especially important in developing countries where many students entering university for the first time may have had limited prior exposure to computers and internet technology. For cultures with high uncertainty avoidance, as found in South Africa, and Africa, in general, more structure and fewer complications when using a technology may provide more favourable perceptions about that technology (Anandarajan, Igbaria, & Anakwe, 2002). Hubona and Geitz (1997) state, “there must be a fit between technology and task and between individual characteristics and the technology” (p. 4). We need to stop looking at students “from the outside in, (and look) instead ... from the inside out” (Marshall, 1999, p. 314).

Naturally, students are not all equally satisfied with the introduction of technology-enhanced learning environments; some are positive (Petracchi, 2000; Kendall, 2001), while others express frustration (Hara & Kling, 1999; Carr, 2000). According to Sanders and Morrison-Shetlar (2002), student attitudes toward the Internet and web-based or web-enhanced courses can influence the future use of the web-based instructional materials and how educationally beneficial web-based resources are for students.

Students are more and more Web-savvy (Kibirge & DePalo, 2000), many of them having been brought up around computers and the Internet. Tapscott (1998, p. 190) states, “technology does not dazzle” this generation. However, they matriculate with a diversity of computer and Web-searching skills and experience. In many developing countries, students may be required to use technologies with which they are not always familiar (e.g., computer and Internet technologies) and to adapt to new modes of interaction with the lecturer (e.g., interaction through electronic mail) (Warschauer, 1998; Brown, 2002). Research indicates that the level of computing and Internet experience with which students enter higher education
might influence whether or not they will use electronic resources (McGuigan, 2001).

The purpose of this article is, therefore, to report on the factors that affect English Second Language (ESL) students’ acceptance and use of the technology-enhanced component of a content-based strategic reading module offered via mixed mode delivery. The implications of the results for designing technology-enhanced courses as well as the support that should be given to ESL learners who must use the technology are discussed.

**Review of the Literature and Theoretical Framework**

In this study we have drawn on theories from several reference disciplines in order to better understand the phenomenon of technology acceptance and use by ESL students learning English in a developing country. All of these theories accord salience to aspects of the individual as well as the social and environmental context within which technology acceptance behaviour is likely to be exhibited. A review of the literature indicated that two theories have immediate relevance to the purpose of this study, namely Davis’s (1986, 1989, 1993) Technology Acceptance Model, used in the field of Management and Information Science, and Bandura’s (1978, 1997) Social Cognitive Theory, used in the Educational Psychology field. The use of individual acceptance and use of Internet and Computing Technology (ICT) has been researched from multiple theoretical perspectives using a wide range of constructs and definitions. The main research stream attempts to understand and explain the determinants of the behaviour of accepting and using ICT innovation.

The Technology Acceptance Model (TAM) was developed by Davis (1986) to explain computer-usage behaviour. The theoretical basis of the model was Fishbein and Ajzen’s (1975) Theory of Reasoned Action which belongs to the field of Social Psychology. These theories are based on intentions as the direct antecedent of actual behaviour. Davis, Bagozzi, and Warshaw (1989) state that the “goal of TAM is to provide an explanation of the determinants of computer usage that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations” (p. 983). The TAM theorizes that an individual’s actual system usage is determined by behavioural intention, which is in turn jointly determined by perceived usefulness and perceived ease of use. Behavioural intention is defined as the extent to which an individual intends to
perform a specific behaviour (Davis et al., 1989). Perceived usefulness is the extent to which a person believes that using an application will increase his/her performance, and perceived ease of use is the extent to which a person believes that using the technology will be free of effort (Davis, 1989). The TAM posits that the impact of other external variables on behavioural intention is fully mediated by these two beliefs of usefulness and ease of use (see Figure 1). Davis (1989) also hypothesises that perceived ease of use has a significant direct effect on perceived usefulness. One of the underlying assumptions of TAM is, therefore, that the easier technology is to use, and the more useful it is perceived, the more positive the intentions to use that technology. These relationships have been examined and supported by many prior studies (Davis, 1989; Davis et al., 1989; Venkatesh & Davis, 2000).

Social Cognitive Theory is a widely accepted and empirically validated theory of individual behaviour (Igbaria & Iivari, 1995). Social cognitive theory has been utilized recently by researchers not specifically to predict acceptance behaviours but to provide additional insights into the determinants of acceptance behaviours. Social cognitive theory (Bandura, 1986, 1997) posits that people are neither driven by inner forces, nor simply by external stimuli. Instead, human behaviour is explained via a model of triadic reciprocity in which behaviour, personal factors, and environmental events all operate interactively as determinants of each other (see Figure 2).

Social cognitive theory incorporates two specific expectational dimensions: outcome dimensions and self-efficacy. Individuals are more likely to undertake behaviour they believe will result in valued outcomes (i.e., outcome expectations - the consequences expected from one’s own actions); however, outcomes in themselves may be insufficient in influencing behaviour if individuals doubt their capabilities to succeed (self-efficacy) (Compeau & Higgins, 1995). For example, an efficacious student may believe that he/she has the capability to use the computer for language learning. Nonetheless, he/she may also believe that despite his/her perceived capability he/she will not earn a good grade in the English class because the instructor does not like him/her.

Self-efficacy is a comprehensive summary or judgment of perceived capability for performing a specific task. It is a dynamic construct that changes over time as new information and experiences are acquired. Efficacy beliefs involve a mobilisation component (i.e., a belief that one can assemble and orchestrate the
application of expertise and effort necessary to solve a problem) that is future-oriented. Self-efficacy is not concerned with what one has done in the past, but rather with judgments of what could be done in the future. Self-efficacy is not concerned with the skills one has but with judgments of what one can do with whatever skills one possesses (Bandura, 1986, 1997; Pajares, 1997).

Self-efficacy beliefs influence task choice, effort, persistence, resilience, and achievement (Bandura, 1997; Schunk, 1995). Many empirical studies have validated this proposition in a wide variety of settings such as complex decision-making (Wood & Bandura, 1989), computer skill acquisition (Mitchell, Hopper, Daniels, George-Falvy, & James, 1994), and user acceptance of technology (Venkatesh, 2000). Bandura (1997) synthesises the relation between self-efficacy and outcome expectations by saying that “people take action when they hold efficacy beliefs and outcome expectations that make the effort worthwhile” (p. 24).

Research has also focussed on exploring the relationship between enjoyment (i.e., intrinsic motivation), computer self-efficacy, and technology adoption (Compeau & Higgins, 1995; Igbaria & Iivari, 1995; Marakas, Yi, & Johnson, 1998; Venkatesh, 2000; Venkatesh, Speier, & Morris, 2002).

Enjoyment refers to the extent to which the activity of using ICT is perceived to be personally enjoyable in its own right aside from the instrumental value it may have (Davis, Bagozzi, & Warshaw, 1992). In some research studies, enjoyment has been proposed as a determinant of behavioural intention (Davis et al., 1992; Venkatesh et al., 2002), and as a determinant of ease of use (Venkatesh, 2000). Venkatesh (2000) showed that the effect of enjoyment on ease of use became stronger as users gained more direct experience with ICT.

Computer self-efficacy is defined as a judgment of one’s capability to use a computer in the accomplishment of a specific task (Compeau & Higgins, 1995; Marakas et al., 1998). It should be distinguished from general self-efficacy by its focus on a specific computer-mediated task. Research has shown a strong relationship between computer self-efficacy and ease of use ($\beta=0.43$) (Agarwal, Sambamurthy, & Stair, 2000). This indicates that users regard ICT easier to use when their conviction in their own efficacy regarding ICT is higher. Two additional studies found strong correlations between computer self-efficacy and ICT use at $r=0.45$ (Compeau & Higgins, 1995) and $r=0.43$ (Compeau, Higgins, & Huff, 1999).
Description of the Technology-Enhanced Component of a Strategic Reading Module

A large body of research conducted over the past decade (Kasper, 1997; Grabe & Stoller, 1997; Pally, 2000) has shown that content-based instruction is highly effective in helping ESL students develop the literacies they need to be successful in academic and workforce environments. The work of Kasper (2000a; 2000b; 2002) has reported both improved language and content performance among students exposed to content-based EAP programmes, higher scores on measures of reading proficiency, and higher pass rates on ESL courses.

Research indicates that a small but significant number of first-year university students in developing countries commence their studies with less than adequate reading comprehension abilities and reading strategy use (Dreyer, 1998; Perkins, 1991; Pretorius, 2001; Van Wyk, 2001). In order to meet the strategic reading needs of students within the 21st century, educators are pressed to develop effective instructional means for teaching reading comprehension and reading strategy use. The result is that the Department of English at Potchefstroom University implemented a content-based strategic reading module, as part of the English for Professional Purposes course, offered via mixed mode delivery. The strategic reading module consisted of the following: a printed interactive study guide, contact sessions (face-to-face), and the technology-enhanced component, namely Varsite.

Varsite is a Learning Content Management System (LCMS) accessible via the Internet. A LCMS is a multi-user environment where faculty can create, store, reuse, manage, and deliver digital learning content from a central object repository. A LCMS contains four basic elements: (1) a dynamic delivery interface (providing links to related sources of information, resources, the electronic study guide, and supports assessment with user feedback), (2) an automated authoring system (used to create the reusable learning objects that are accessible in the repository), (3) an administrative system (used to manage student records, track and report student progress, and provide other basic administrative functions), and (4) the learning object repository (serving as a central database in which learning content is stored and managed, and made accessible to the learners).

The students had access to the following features within Varsite: (1) electronic study guide, (2) announcement section, (3) assignment and resource section, (4) assessment section, and (5) interaction with peers and instructors. Each of these is described below.
The electronic study guide differed from the printed interactive study guide in that it contained only the main points of emphasis on the reading process and the various reading strategies. It did not contain detailed explanations or examples. The purpose of the electronic study guide was to provide a quick reference for students while they were completing tasks that required them to follow a number of hyperlinks. For example, if the students wanted to know about text structure they could simply click on the study guide link and they would be taken to the relevant page in the electronic study guide.

The second feature was the announcement section. Here, the lecturers informed the students on a daily basis of assignments that had to be completed as well as due dates.

In the assignment and resource section students were given a detailed outline of the tasks to be completed; the resource section contained two sub-sections, one on general topics and one specifically for Communication Studies. The resource section also contained a number of hyperlinks that were updated on a weekly basis to ensure that students had access to a plethora of information on the specific topics being discussed in their Communication Studies class. The English lecturers coordinated their teaching schedules with that of the Communication Studies lecturer. During the first seven weeks of the semester, the lecturers provided the students with a variety of generic topics (e.g., current news, music, business reports, etc.), as well as a number of hyperlinks (i.e., scaffolding) that they had to use in order to gain access to the information needed for the completion of the tasks. During the last six weeks of the semester, the students were allowed to “surf” the Internet on their own, with only limited guidance from the lecturers, in order to find the information needed to complete the assignments. The assignments focussed on the use of reading strategies (e.g., predict what information the following website will contain; summarise an article on non-verbal communication, etc.).

The fourth feature, the assessment section, was used in order to set a number of online practice assessments. Students had to make use of a variety of reading strategies in order to complete the assessments (e.g., identify the purpose of a selected piece of text, identify the main idea, make inferences, predict, formulate questions, summarise, etc.).

The fifth feature was interaction with fellow students and also with the faculty. This was accomplished via email.
In general, the Varsite environment exposed students to a variety of authentic information that increased their background knowledge and comprehension of topics they were also discussing in their Communication Studies class (e.g., small groups, conflict in small groups, etc.). Some of the sites included video and audio clips (e.g., interviewing, negotiation skills, etc.). Initially, the activities and tasks were faculty-guided, but as the students gained confidence, they were allowed to make their own choices. The rationale for using selected readings from the Internet was to surpass what faculty could offer in the contact sessions.

Method of Research

Design

In this study a combined qualitative and quantitative research method was used. A Dominant-Less Dominant design was used (Creswell, 1994). The qualitative research approach was consistent with naturalistic case study methodology (Merriam, 1998). The quantitative feature of the study included testing the themes that emerged from the qualitative part of the study by means of an exploratory factor analysis.

Participants

All first-year students (N=131) taking the English for Professional Purposes course at a university in South Africa participated in this study. The participants included speakers of Afrikaans and Setswana majoring in Communication Studies and Psychology.

Instrumentation

Qualitative

Semi-structured interviews were conducted with the students in order to obtain data on their perspectives with regard to their experience of the technology-enhanced component as well as their perspectives on variables that affected their acceptance and use of the technology-enhanced component of the strategic reading module. E-mail messages sent to the lecturers were analysed for possible themes affecting their acceptance and use (e.g., difficulty in finding information). Informal conversations were conducted with students during contact sessions and researchers' field notes were also used to identify and confirm developing themes.
Quantitative

A survey questionnaire for determining the factors students' identified as having an affect on their acceptance and use of the technology-enhanced component of the strategic reading module was developed (cf. Appendix A). The survey instrument consisted of 27 items and was based on the underlying themes identified in the qualitative part of the study as well as on a review of the literature. All items used a seven-point Likert scale with 1 representing strongly disagree and 7 representing strongly agree.

Data collection procedure

The qualitative component of the study was completed during the second semester of 2002. The questionnaire was completed in a scheduled contact session period at the end of the second semester of 2002. All background information on the students was obtained from the university academic administration.

Analysis

The qualitative data were analysed by identifying underlying themes using the constant comparative method and triangulation (Lincoln & Guba, 1985; Miles & Huberman, 1994).

An exploratory factor analysis was used to detect and assess sources of variation and covariation in observed measurements (Joreskog, Sorbom, du Toit, & du Toit, 2000). The factors were created using the extraction method of principal component analysis, with the rotation method of Varimax with Kaiser normalization. Cronbach's alpha was used for determining the reliability of individual scales (Cronbach, 1961). Coefficient alpha is a general formula for scale reliability based on internal consistency. It provides a lower bound for the proportion of test variance among construct indicators that may be attributed to a single common factor.

A stepwise multiple regression analysis was conducted using the factors identified in the factor analysis as independent variables and technology acceptance and use as the criterion measure (Seliger & Shohamy, 1989).

Results and Discussion

The results of the qualitative part of the study are presented under the categories that emerged while collecting the data. During the interviews, the informal conversations, and the email messages the students made the following comments:
Ease of use

“I’ve never used a computer before and I didn’t do the compulsory first semester course on the introduction to information technology (RINL111) so I found it a bit difficult to find my way”.

“It was easy to use Varsite because our RINL 111 course was presented in the same way”.

“It was easy to use the links and hyperlinks, because our lecturer first guided us and then she allowed us to ‘surf’ on our own”.

“This is the first time I’ve used a computer for learning and it wasn’t easy”.

“I found it a bit difficult because there were too many buttons, menus and things to click”.

“It was easier and faster to use and get information than the library, and I could also do it at 12 o’clock at night in my own room”.

The researchers’ field notes indicated a similar trend:

“We need to make sure that there are only a few menus for the students to choose from so that they don’t become confused”.

“Those students with no prior computer skills or exposure to the Internet and WWW have a lot of difficulty mastering the environment”.

“It seems as if students experience problems when they want to open multiple windows, especially when trying to take notes while doing a task or reading the electronic guide”.

Usefulness

“I liked using Varsite because I could get a lot of relevant information for the completion of my tasks”.

“Using Varsite was very useful because the content was clear and well structured”.

“The feedback I received while doing the assessments was very useful, and I could also follow links to a particular section that I was having trouble with in the electronic guide”.
Enjoyment

"Using Varsite was a lot of fun, especially to practise our reading strategies without any stress".

"It was a pleasant change to just listening to lectures".

"It was very enjoyable because we got to do a lot of authentic tasks that were relevant to our majors”.

"It was fun practising the reading strategies on cool websites”.

Computer self-efficacy

"I didn’t really master Varsite because my computer skills are not good”.

"I’m not good with using the links”.

"I’m good with computers and I surf the web everyday, so I’ll handle Varsite”.

Outcome expectations

"Knowing how to use Varsite has helped me to improve my performance in my English course as well as in my Communication Studies course; this was great!”.

"I think if I really get stuck into Varsite, my performance in my major and in my English course will improve”.

Quality of resources

"The video and audio clips were good; I didn’t get bored”.

"The text in the electronic guide was easily readable and I didn’t have to scroll for pages to get the most important information”.

"I found the links to the websites really cool; they were well selected and helped me with my work in my major as well”.

"I think the pictures/animations should have been put closer to the text so that I could see the explanation while looking at the picture”.

The results of the qualitative part of the study indicated that students commented on issues such as their beliefs in their computer skill abilities, the ease of using Varsite, the usefulness of the learning materials provided via Varsite, the enjoyment of being able to access and practise their reading strategies on “cool” and “relevant”
websites, that using Varsite fulfilled their outcome expectations which were mostly linked to performance in exams and assignments (i.e., assessments), and they also commented on the quality of the resources provided within Varsite. Overall, the results seem to indicate that attention needs to be given to the design of technology-enhanced language courses as well as the support that should be given to the ESL students, especially proper training sessions on the use of the technology, and also creating awareness among students as to their individual learner differences and how these affect their language learning.

The principal component analysis with varimax rotation yielded six distinct factors (see Table 1). These factors correspond to the themes identified in the qualitative part of the study. Factor loadings for all variables are greater than 0.55 and are thus considered high (Nunnally & Bernstein, 1993). The scree plot verifies the presence of the six distinct factors having eigenvalues greater than 1 (see Figure 3).

The constructs were assessed for reliability using Cronbach's alpha (see Table 2). These values are all greater than the minimum of 0.7 required for constructs to be deemed reliable (Cronbach, 1961; Hair, Anderson, Tatham, & Black, 1992).

The results of the multiple regression analysis indicated that approximately 71% of the total variance of Varsite acceptance and use was explained by computer self-efficacy, ease of use, enjoyment and outcome expectations. Usefulness and the quality of the resources also contributed to the total variance, but the contribution was not statistically significant (see Table 3).

Research indicates that students are generally more interested in performing activities in which they have high self-efficacy (Ren, 2000). It is, therefore, possible that students with high computer self-efficacy will be more likely to take advantage of what is around them. That is, if they are familiar and feel comfortable with computers, they will use them, and if they feel that learning within the Varsite environment will enhance their strategic reading performance as well as their performance in their majors, they will learn to use Varsite. Research has demonstrated that college students' computer use and their technology acceptance are positively related to computer self-efficacy. Ren (2000) states: "Computer self-efficacy has a direct effect on a person's perception of the ease of computer use, which, in turn, affects the frequency and time of computer use" (p. 324). Similarly, Nahl and Tenopir (1996) found that higher self-efficacy translated into higher search efficiency, success, and satisfaction. It is, therefore, important to consider
not merely how capable learners are, but how capable learners believe themselves to be.

The results also seem to support the view that ensuring students are comfortable with the technology, and making the learning experience enjoyable may have salutary outcomes. Similarly, the more valued the outcome expectations, the more likely the students will be to accept and use ICT. In addition, language course developers need to ensure that the technology-enhanced components of a course are easy to navigate and that the links are easy to follow. This is especially important when the course is being designed for ESL students in developing countries, where their previous experience with working with ICT may be very limited. There needs to be an awareness of the individual learner difference profile of potential users. Assumptions cannot be made as to their ICT skill level, especially where the student body is highly diverse.

Conclusion

The results of this study indicate the important role that variables such as computer self-efficacy, ease of use, enjoyment, outcome expectations, usefulness, and quality of resources play in determining ESL students’ acceptance and use of a technology-enhanced component of a content-based strategic reading module offered via mixed mode delivery. Knowing how students feel about using ICT can help educators establish a learning environment that addresses the students’ needs. An examination of computer self-efficacy beliefs may be helpful to both the student and the educator. Self-knowledge of abilities serve as a stimulus to attain ICT skills relevant for language learning. Understanding students’ perception of their capability to master ICT competencies allows the educator to compensate for individual differences by tailoring instruction. Therefore, through our understanding of how students respond to the technology-enhanced features of ESL courses we can better design these courses and support the students who have to use these technologies.

Successful acceptance and use of technology-enhanced ESL courses may depend on:

- The provision of an integrated instructional design;
- The use of a consistent framework and nomenclature;
- Capitalising on the best that both methods (contact and technology-enhanced features) have to offer ESL students;
- Providing maximum flexibility and variety to the ESL students;
- Making ESL students feel comfortable with the technology;
- Ensuring that enjoyment is a constant feature;
- Addressing individual differences (e.g., self-efficacy, outcome expectations) with regard to technology acceptance and use;
- Providing training for ESL students to ensure a short learning curve with regard to the use of the technology-enhanced component (i.e., ease of use).

From a theoretical viewpoint this research study has the potential to contribute significantly to the accumulated research base examining factors affecting technology acceptance and use by providing a perspective from English Second Language learning, specifically content-based strategic reading, an area where little research into this topic has been conducted. Future research should further test the identified factors by using a structural equation model.

As is true with virtually all studies trying to offer explanations of behavioural phenomena, the current study is almost certainly incomplete. The possible inclusion of other motivational variables to further assess the complex relationship of factors affecting ESL students’ acceptance and use of technology-enhanced teaching and learning environments for language learning, and specifically strategic reading, should be actively pursued by future research.
References


Appendix A: Technology Acceptance and Use Questionnaire

Ease of use
1. Learning to use Varsite was easy for me.
2. Learning to navigate within Varsite was easy for me.
3. Using and following the links and hyperlinks provided within Varsite was easy for me.
4. I find Varsite flexible to interact with.

Usefulness
1. Using Varsite is useful in exposing me to a variety of material that enhances my background knowledge.
2. Using Varsite is useful as it allows me to access the latest and greatest variety of information.
3. Using Varsite is useful as the content is logically structured and the feedback is effective.

Enjoyment
1. I had fun using Varsite.
2. Using Varsite was pleasant.
3. Using Varsite was enjoyable.

Computer self-efficacy
I believe I have the ability to:
1. take a test using Varsite's assessment section.
2. use the electronic study guide in Varsite effectively.
3. check the announcements on Varsite.
4. move between Varsite's components quickly and easily.
5. download information from Varsite to my stiffie/floppy disk.

Outcome expectancy
1. Knowing how to use Varsite will help improve my performance in the English class.
2. Knowing how to use Varsite will help improve my performance in the Communication class.
3. Knowing how to use Varsite will ensure that I do well in my assignments.
Quality of resources
1. The graphics, animation, sound and video used in Varsite are appropriate.
2. The text in the electronic study guide was readable.
3. The links provided in the material are appropriate, clearly visible and logical.
4. The Varsite interface and layout are appropriate.
5. The selection of websites was appropriate.

Acceptance and Use
1. I use Varsite a lot to do my course work.
2. I use Varsite whenever possible to do my course work.
3. I use Varsite frequently to do my course work.
4. I use Varsite whenever appropriate to do my course work.
Table 1: Factor analysis

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Table 2: Reliability analysis

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Table 3: Summary of stepwise multiple regression analysis

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<th>Step</th>
<th>Predictor variable</th>
<th>Multiple R</th>
<th>Multiple $R^2$</th>
<th>Beta</th>
<th>Std. Err. of Beta</th>
<th>T(125)</th>
<th>p-level</th>
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Adjusted $R^2=0.71$
Figure 1: Davis' Technology Acceptance Model
Figure 2: Bandura's Triadic Reciprocity
Figure 3: Scree Plot of Eigenvalues
Chapter 5
Conclusion and recommendations for future research

5.1 Introduction
An important goal of research on strategic reading (e.g., fluency, vocabulary, reading comprehension, reading strategy use, etc.) is the larger goal of improving students’ reading proficiency. This goal, however, is mediated by at least two critical variables. First, the research must be translated into appropriate instruction. Second, teachers at primary and secondary levels, and lecturers, at tertiary level, must enact that instruction. Regardless of the quantity and quality of research-based knowledge about strategic reading, unless teachers and lecturers use that knowledge to improve their instruction, students’ reading achievement will not improve. In addition, the goal of providing content-based strategic reading instruction within a technology-enhanced environment is to stimulate and steer the innovative and appropriate use of technology for ESL course-support purposes within the faculty, in order to make educational delivery more efficient, more enriched, and more flexible. The purpose of this chapter is to provide a summary of the results obtained in this study as well as to indicate recommendations for future research.

5.2 General conclusion
The ability to read academic texts is considered one of the most important skills that university students of English as a Second Language need to acquire. It should be noted that for the most part reading instruction in ESL university courses tends to focus on text processing; on the student’s understanding of the language of the text. In the current technological age, however, with its proliferation of information needed for academic purposes, students are exposed not only to conventional text presentation but also to electronic texts. The type of skills students require in order to cope with academic reading of both conventional and electronic texts comprises basic academic reading skills and strategies as well as strategic reading skills and strategies.

To help ESL students meet increasingly stringent academic demands, specifically strategic reading demands, educators must redesign and implement programmes and courses that will facilitate the reading and academic success of these students. Thus, fulfilling the academic as well as the reading needs of the ESL student...
population must become a priority of English language instruction. While no one questions the need for teaching strategic reading skills and strategies, there is no consensus as to the learning environment in which these skills may be developed by ESL learners. The research presented in this study suggests that a content-based strategic reading module offered within a distributed learning environment (i.e., contact sessions enhanced by technology) may be an effective and efficient way of addressing both of these needs.

5.3 Research questions and hypotheses

Based on the research questions and the hypotheses formulated in chapter one, the following results were obtained:

The strategic reading module of the English for Professional Purposes course was designed for mixed mode delivery. The structure and format of the strategic reading module consisted of an interactive study guide, contact sessions, and Varsite (i.e., a learning content management system) (cf. Chapter 2).

With regard to the students' reading comprehension and reading strategy use profiles, the results indicated that the at-risk students differed statistically \( (p<0.0001) \), as well as practically significantly \( (d\geq0.8) \) from the successful students on all the reading comprehension measures. The TOEFL scores indicated that some of the students' language proficiency levels can be considered to be too low for academic work. In terms of reading strategy use, the post-test results indicated that the students in the experimental group used certain strategies statistically \( (p<0.05) \), as well as practically significantly (small to large effect sizes), more often than the students in the control group. The successful students in this study were active during all three phases of reading. Based on the results obtained in this study it is possible to reject the null hypothesis formulated in chapter 1.

The results indicated that the students who received strategic reading instruction in the technology-enhanced environment received both statistically and practically significantly higher marks on three reading comprehension measures than did the students in the control group. This was true for successful students, as well as for those considered to be at-risk. Based on the results obtained in this study it is possible to reject the null hypothesis formulated in chapter 1.
An analysis of the reading assessment profiles of the students participating in this study indicated that they experienced problems across all aspects of the reading components assessed (vocabulary, fluency, and reading comprehension and reading strategies). An analysis of the successful student’s reading assessment profile indicated that his/her profile was far flatter than that of the at-risk student; the successful student had far fewer ups and downs in his/her profile than the at-risk student (i.e., the majority of the successful student’s mean reading assessment scores were scattered around or above the norm/guidelines for first-year students) (cf. chapter 3).

The results of an exploratory factor analysis indicated that computer self-efficacy, ease of use, enjoyment, outcome expectations, usefulness, and quality of resources were major factors affecting ESL students’ acceptance and use of the technology-enhanced component of a strategic reading module. In addition, the results of the multiple regression analysis indicated that approximately 71% of the total variance of Varsite acceptance and use was explained by computer self-efficacy, ease of use, enjoyment, and outcome expectations. Usefulness and the quality of the resources also contributed to the total variance, but the contribution was not statistically significant (cf. Chapter 4). Based on the results obtained in this study it is possible to reject the null hypothesis formulated in chapter 1.

5.4 Recommendations for future research
A core problem for researchers interested in the issue of content-based strategic reading is the absence of an adequately rich set of theories and models to provide a coherent foundation for their work. This set of theories needs to be sufficiently complex to encompass the array of factors involved in proficient reading at university level; simultaneously, it needs to be informed by the multiple perspectives (including educational, cognitive, linguistic, sociolinguistic, discourse analytic, and cultural perspectives) that have been brought to bear in the design and conduct of literacy research. Considerable research has been directed at issues of reading comprehension, but those research efforts have been neither systematic nor interconnected. In addition, the research-based knowledge about comprehension does not simultaneously attend to the demands of reading to learn during content-area instruction, and it does not incorporate responses to the reading profiles of many of the students in today’s lecture halls.
What still remains rare are models and guidelines that are based on theoretical or empirical research findings to guide lecturers towards pedagogically sound practices. The use of a distributed or technology-enhanced learning environment for teaching strategic reading at university raises many questions regarding the design of these environments that differ from the traditional design of text-based systems.

The following research questions deserve further attention:

- In order to help the student organise visual and verbal information into coherent internal mental representations, can the use of graphic representations of knowledge structures, such as overview maps, facilitate learning?
- How can prior knowledge be activated by multimedia prereading activities in order to help students build external connections, such as advance organisers in verbal (textual, audio) form and visual (graphic, photographic, or videographic) form?
- For whom are certain types of multimedia information helpful for each of the processes of text comprehension?
- How do different learners respond to different modes of information presentation?
- What is the relative power of various instructional delivery systems for helping lecturers acquire the knowledge and skills they need to successfully teach strategic reading to a diverse population of students?

Understanding the nature of the reading problem requires having available good data identifying which learners can successfully undertake which activities with which texts. Such data are very scarce, in part because the widely used assessment instruments are inadequate. Lecturers also need valid and reliable assessments tied closely to their curricula so that they can see which students are learning as expected and which need extra help.

The following research questions, therefore, need to be addressed:
• How can lecturers/researchers measure strategic, self-regulated reading, including a student's use of such strategies as questioning, comprehension monitoring, and organising the knowledge gained from text?

• To what extent are performance-based assessments of reading sensitive to a student's competencies in such processes as vocabulary, cognitive strategies, writing ability, reading fluency, domain content knowledge of the texts, and such dispositions as motivation and self-efficacy for reading?

• How do we design valid and reliable measures of self-regulated, strategic reading that lecturers can administer in the lecture halls to inform their instructional decisions?
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