THE EFFECTS OF TEACHING A MULTICOMPONENT READING STRATEGY ON UNIVERSITY ESL STUDENTS' READING COMPREHENSION AND REPORTS OF READING STRATEGIES

By

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A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Teacher Education

1991

ABSTRACT

THE EFFECTS OF TEACHING A MULTICOMPONENT STRATEGY ON UNIVERSITY ESL STUDENTS' READING COMPREHENSION AND REPORTS OF READING STRATEGIES

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Although extensive research has been conducted on the effects on comprehension of teaching reading strategies to native English speakers, research in this area has not been conducted with students in English as a Second Language (ESL) classes. This dissertation examined the effects of teaching SQ3R both with a focus on strategic reading and as a non-strategic study skills unit on university ESL students' reading comprehension and ability to report their use of reading strategies. Forty-five Malay students were divided into two treatment groups and one control group. One treatment group received instruction in SQ3R with additional instruction in strategic reading, while the second treatment group was instructed in SQ3R in a procedural, non-strategic manner. A control group received no treatment. The subjects were given posttreatment measures in reading comprehension and reporting reading strategies. The results indicated that the effects on comprehension of teaching SQ3R either strategically or procedurally were beneficial to comprehension. In addition, after treatment both treatment groups reported using more reading strategies than the control group.

ACKNOWLEDGMENTS

After grappling with this dissertation for almost four years, I have accumulated debts of gratitude to more people than I can do justice in a brief acknowledgment. My committee was particularly helpful and supportive. Gerry Duffy, aka "The Mentor", deserves combat pay for acting as my advisor. He frequently wondered which would arrive first: this dissertation or his retirement. Jim and Barb Gallagher gave me shelter, transportation, and working space during my pilgrimages to campus, and refrained from reminding me of Ben Franklin's advice that guests and fish smell after three days. Taffy Raphael and Perry Lanier took time away from their overwhelming workloads to read, reread, and again read drafts of this dissertation, yet despaired not. Bob Flagler, now back with the University of Minnesota in Duluth, deserves special thanks for assisting me with the testing and evaluation of the data. I also owe much to Bruce Burke and Laura Roehler for providing me with the means of supporting myself and family while at the same time gaining valuable experience during my residency on campus. And I am indebted to the Michigan winter for fostering within me a love of the tropics. Finally, of course, to my wife, Carol, who is undoubtedly relieved that she is no longer a dissertation widow.

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CHAPTER ONE

INTRODUCTION AND PURPOSE

Introduction

Universities in the United States accept a large number of foreign students into both undergraduate and graduate programs. Frequently, these students have severe deficiencies in English that must be resolved before they can succeed in academic programs. This remedial instruction is usually provided by English as a Second Language (ESL) components within the university. Since these components are usually within the English or linguistics departments, ESL instruction tends to be based on linguistic theories with a focus on the content of language structure rather than on the metacognitive processes of language.

ESL reading instruction at the university level is frequently devoted to drill and practice with grammar, word forms, and vocabulary toward the objective of improving the students' decoding skills but with little or no attention directed to the process of actively and consciously applying strategies to reading problems.

Research investigating reading comprehension of native English speaking students, for instance, has shown that effective readers have a knowledge of strategies and possess metacognitive awareness (Palincsar and Brown, 1989). In addition, research has shown that students show significant

gains in reading comprehension after instruction in reading strategies (Duffy, Roehler, Meloth, Vavrus, Book, Putnam, and Wesselman, 1986; Duffy, Roehler, Sivan, Rackliffe, Book, Meloth, Vavrus, Wesselman, Putnam, and Bassiri, 1987; Paris, Cross, and Lipson, 1984; Paris, Lipson, and Wixson, 1983) and in metacognitive training (Baker and Brown, 1984; Gundstone, 1988; Karabenick, 1987; Paris and Jacobs, 1984; Wade and Reynolds, 1989).

These studies have demonstrated the importance of being a strategic reader and have identified specific strategies that are particularly useful, such as setting purpose, predicting content, and generating questions. Despite the necessity of linguistic proficiency as a prerequisite, success with reading academic English requires more than competence with decoding linguistic structures and recognizing word forms. Moreover, Clarke (1980) has suggested that relying on the use of syntactic cues in reading may "short-circuit" effective reading systems used by students before ESL instruction, resulting in their reverting to poor reading behaviors when confronted with difficult reading.

Furthermore, it is unlikely that an ESL program can even develop linguistic competence in the limited time allocated for instruction. In short, teaching grammar and vocabulary is not enough; ESL students need instruction and practice in applying strategies to reading to help compensate for their linguistic weaknesses.

The purpose of this dissertation was to study the

effects that the explicit instruction of a multicomponent strategy has on the reading comprehension of students enrolled in a university level English as a Second Language A multicomponent strategy is an integrated system of self-regulated actions focused on developing the awareness and use of reading strategies. This means that readers were taught to regard strategic reading as an integration of several skills and activities that can be used together or independently to resolve reading problems. Included in a multicomponent strategy is the self-monitoring of reading, recognition of problems, and self-evaluation of reading comprehension.

The SQ3R (Survey-Question-Read-Recite-Review) method developed by Francis P. Robinson (1970) was selected as the basis for teaching strategic reading. SQ3R consists of five steps that direct the reader to (1) gain an overall orientation of a reading selection, (2) devise questions before reading, (3) read with the specific purpose of answering questions, (4) summarize what was read, and (5) review in order to confirm understanding. While using this method, students are engaged in using reading strategies such as questioning, summarizing, using headings and text structure, notetaking, and organizing information.

SQ3R was selected as the basis for a multicomponent strategy for this study because it is an integrated and systematic method that is useful in introducing several strategies. In addition, it encourages the students to

activate schema while giving them a sense of potential difficulty. SQ3R has been used successfully with all age groups and reading levels of native English speakers (Adams, Carnine, and Gersten, 1982; Donald, 1987; Durr, 1963), and has been found to be particularly effective with college level students (Simpson, 1986; Snyder, 1984; Tomilson, 1987).

Factors that have been considered in the development of this project include the nature of reading comprehension, the effect that strategic reading has on the reading comprehension of native speakers, the nature of reading instruction in ESL classrooms, and the potential role of teaching reading strategies in ESL classes.

The subjects used in this study were ethnic Malays who are enrolled in a Malaysian-American university cooperative program. These students came from a strict, prescriptive educational system that does not teach strategic reading.

The subsequent sections of this chapter will provide background information by describing the educational background of the subjects, some characteristics of Malay students, and the site of data collection.

Background

The Content of the Study

A Description of the Malaysian Education System. The education system in Malaysia was established by the British during the colonial era and continued to follow the British model after independence. The underlying philosophy is that

beyond the government's responsibility for providing literacy and basic skills necessary for functioning in society, education is not a right, but a privilege that must be earned. The education system operates on a prescribed national curriculum in which less promising children are screened out early (Inglis, 1979). Schools are crowded with an average class size of fifty students, and the majority of schools operate on daily split sessions (Robertson, 1984).

Children begin schooling at age six and are provided with six years of compulsory education designated as Standards One through Six. At the end of Standard Five, all students are given a general ability assessment to identify high achievers who are transferred to special government residential schools. Upon completion of Standard Six, all students are automatically promoted to the secondary level, which are called Forms. At this point, education is no longer compulsory and continued schooling depends entirely on student performance on a series of standardized government examinations given at various levels (See Appendix A).

Although the official medium of instruction is the Malay language, "Bahasa Malaysia" or "Bahasa" for short, Chinese and Indians are permitted to operate their own schools in Mandarin or Tamil at the Standards level as long as they follow the prescribed government curriculum. However, formal government testing is conducted in Bahasa and the medium of instruction at the secondary level is completely in Bahasa. All students are tested for proficiency in Bahasa at the end

of Standard Six and, if the results are unsatisfactory, are required to spend another year, called the "Remove Year", of intensive training in Bahasa.

The secondary level is divided into two sublevels: lower secondary, consisting of Forms I through III, and upper secondary, which includes Forms IV and V. The lower secondary curriculum is a prescribed general curriculum including science, math, and English. Students are permitted to study one vocational subject, such as industrial arts.

Upon conclusion of Form III, all students are required to sit for a government examination called SRP (Sijil Rendah Pelanjaran). Those who fail are dismissed from further education in government schools. The successful students receive the SRP diploma and, based on the examination results, are tracked by the government into one of two upper form streams: academic and vocational. The academic stream is further dividend into the Arts, Science, and Technical Tracks. The science track is considered to be the more desirable since these students have the best opportunity to continue with post-secondary education. At the end of Form V, students must sit for the SPM (Sijil Pelanjaran Malaysia) examinations which are patterned after the British General Certification (GCE) examinations. Tests are given in a variety of subjects and students must pass at least six exams, including English and Bahasa, to receive the SPM diploma. SPM examinations are graded as follows:

1 and 2	Pass with Distinction
3 through 6	Pass with Credit
7 and 8	Pass with No Credit
9	Fail

Depending on performance on the SPM examinations, the government selects students to attend either pre-university training (Form VI), an alternative diploma program, or sponsors students for study at universities in the United Kingdom, Australia, or the United States. The government determines who will be admitted to which program and what each student's major or specialty will be.

In the two year pre-university program, students continue to study academic subjects. At the conclusion of Form VI, they must pass the STPM (Sijil Tingli Persekolahan Malaysia) exam to be admitted to one of Malaysia's seven degree awarding universities. Students who do not move into Form VI have other options depending on their SPM scores. Those whose scores are inadequate for continued academic consideration may study at vocational or teaching training institutions.

Students with higher scores will either continue studying at any of a variety of diploma awarding public institutions or transfer to private programs. Many of these private programs have agreements with universities in the United States, the United Kingdom, and Australia that permit direct entry to degree programs if the student has maintained a sufficiently high GPA. The drawback with these schemes is

that students receive no government financial support.

However, the Malaysian government has established ethnic quotas for all government sponsored post-secondary education. Presently, 60% of all Malaysian university and diploma program admissions are reserved for Malays, with 30% reserved for Chinese, 9% for Indians, and 1% for "others", which refers to non-Muslim indigenous ethnic populations in the country. For government sponsored overseas study, 95% of the scholarships is reserved for Malays and 5% for non-Malays (Lim, Singh, Muzaffer, and Tan, 1985). One effect of this quota system is that Malays are under less pressure to score well on the SPM than are Chinese or Indians. A Malay with low SPM results has as good or better a chance of being admitted to a university than a Chinese or Indian with higher scores. In addition, Malays who have been selected for these programs have all academic expenses paid by the government and are provided with cash allowances to cover living expenses.

The largest public diploma awarding institution in Malaysia is the Institut Teknologi MARA (ITM) which offers over eighty degree and diploma programs. Entrance and graduation requirements for programs vary and some are designed for direct transfer to the United States or Australia. Admission to ITM is restricted to Malays and the total cost of education, both in Malaysia and overseas, is funded by the government.

A Description of the Malay Student. The majority of Malays live in rural areas and thus a high percentage of Malay students who enter post-secondary programs were graduated from rural areas and small towns. Because of this, the "classroom culture" of Malay students is substantially different from the American student.

To begin with, it is worthwhile to note that the least variable aspect of Malay life is religion. Islam is the focus of Malay consciousness and the Malaysian constitution formally defines "Malay" as a Muslim (Anwar, 1987). Islam is the official state religion of Malaysia, and standards of religious orthodoxy are established and enforced by the government. Conversion by a Malay to another religion is illegal, although conversion to Islam by non-Muslims is encouraged, and any variation from the government mandated doctrine is severely repressed.

Formal religious training begins at age six, the same age that the child enters school, and much effort is devoted to memorizing sections of the Qur'an, the holy book of Islam, in addition to instruction in Islamic doctrine and in each person's obligations as a Muslim and a Malay.

The teaching methodology in Malay schools complements the strict discipline of the religious training. A rigid and authoritarian teacher-student relationship and the preference for rote memorization of material has been transferred to the public school classroom (Coletta, 1977). Individualism is repressed and conformity is demanded; for example, in both

the Standards and the Forms students are required to wear the government mandated uniforms at all public functions.

Deference to authority becomes ingrained. Malays will not readily criticize any authority, not even a government official who is known to be corrupt (Fisk and Osman, 1982). In school, this unquestioned acceptance of authority is constantly reinforced. Malay children are taught to respect and obey teachers in silence, and corporal punishment in the form of beating is expected and freely administered. Students are not permitted to make their own decisions, but are expected to become obedient citizens (Fisk and Osman, 1982).

Malay students resist change, avoid being analytical and critical in thinking, and depend on unquestioned authority and absolutes. They dislike being presented with new ideas and new theories which might inspire doubt and uncertainty. They prefer the familiar and find satisfaction in a little knowledge that is based on tradition and authority (Anwar, 1987; Muzaffer, 1987 Provencher, 1982). Thus, in a classroom, a Malay student is reluctant to speak out at any instance for fear that a comment may be viewed as a challenge to the authority of the teacher. The most successful Malay student is the most passive.

Many Malay students have been accepted by a university or overseas program because of the quota system rather than for their academic success at the secondary level or high SPM scores (Anwar, 1987). Because they have come from rural

areas with poorly equipped schools, they are frequently ill prepared to cope with the demands of university work. Often they are unaware of the nature of their assigned majors and the requirements for completion of a degree. Their poor command of English, limited general knowledge, and demand for absolutes encourage them to rely on study habits that were successful in their village schools: rote memorization, unquestioning obedience, and passivity in the classroom (Anwar, 1987).

As a result, Malay students enter an overseas university program not only with deficiencies in English language proficiency, but with problems in higher conceptual skills. They lack ability in critical thinking, defined by Marzano and Brandt and their colleagues (1988) as reasonable, reflective thinking that is focused on deciding what to believe or do, but accept without question only that which is presented by an authority and which does not conflict with the doctrines of Islam, which to their minds is the ultimate authority.

They also lack critical reading skills, such as the ability to distinguish between fact and opinion. They are unable to evaluate support for an assertion or recognize the implications and logical conclusions that follow explicit statements. The students' reliance on the absolute authority of the printed page is such that they seldom, if ever, question the validity or consider the implications of what appears in textbooks or other class readings unless such

information is in conflict with their religious beliefs.

Furthermore, Malay students tend to perceive information in a text as unrelated, discrete points that must be memorized. They have difficulty recognizing the logical organization of paragraphs as well as the organization of information within larger sections of chapters or an entire textbook. Moreover, Malay students often are unable to relate concepts and information from different sources, and become particularly anxious and confused when reading material is contradictory.

Thus, Malay students have problems that do not generally occur with native speakers. Besides the anticipated difficulties in vocabulary and syntax, their experiences and attitudes further hinder the development of proficient reading. The rigid government system of testing in addition to strict Islamic influences encourage the Malay students to view their role in learning as passive acceptance.

A Description of the Research Site. This study was conducted within the University Preparation Program (UPP) of the ITM/MUCIA Project in Malaysia, which is a cooperative venture between ITM and the Midwest Universities Consortium for International Activities (MUCIA). The program, which permits selected Malay students to complete their first two years of undergraduate studies in Malaysia, is jointly administered by Indiana University and ITM, and the courses, which are taught primarily by American faculty, are accredited by Indiana University. Graduates of the project

may be granted an Associate of General Studies degree by Indiana University upon successful conclusion of study, then transfer to upper-division programs in the United States.

Although English is a required subject in the Malaysian secondary curriculum, students spend only two hours a week in English classes. Experience with students who initially enter the ITM/MUCIA program has shown that they need from one to two semesters of intensive English language instruction before they can assume a full academic course load. The students are provided this instruction through a two track curriculum called the University Preparation Program (UPP). Track 2 students receive instruction in English and study skills for one summer term and two academic semesters while the Track 1 students are in the program for one summer term and one academic semester.

Before entry into UPP, the students' English proficiency is assessed through two tests: (1) Indiana University's Comprehensive English Language Test (CELT), which tests for grammar and vocabulary, and (2) a writing sample evaluated by the UPP staff with the modified version of the Newbury ESL Composition Profile (See Appendix B).

During the preliminary summer session in UPP, students are placed tentatively into either Track 1 or Track 2 based on their performance on diagnostic English language tests. Upon completion of the summer term, the students' writing is reevaluated and final placement is determined based on this sample. Most students enter at Track 2 and remain in the

program for two full academic semesters.

While studying in the University Preparation Program, students take courses in reading, expository writing, listening, computer literacy, and English for academic purposes, which is a special course to provide students with experience in listening to lectures in social studies and the physical science. Students may be permitted to add a remedial mathematics course if necessary. All UPP courses are non-credit.

For both Track 1 and Track 2, a semester is divided into two eight week sessions separated by a midterm evaluation. This evaluation permits the staff to target students who are having difficulties.

Upon completion of the UPP study, students enter the final phase in which they must complete a three credit course in advanced ESL reading and composition that has been designed to prepare them for freshman English Composition.

The data for this study was gathered during the second academic semester. Since the Track 1 students were taking only the advanced ESL reading and writing course at this time, subjects were drawn from Track 2. Students are placed in Track 2 if their composite score on the modified Newbury Profile is lower than 70 points out a possible hundred and a language use (grammar) subscore of fewer than 18 points out a possible 25. A language use subscore below 18 points automatically places the student in Track 2 regardless of the composite score. The writing samples are evaluated by two

members of the ESL staff and the average of the two Newbury Profile scores is taken as the final score. If composite scores of the two evaluations are more than six points apart, a third ESL faculty member evaluates the sample and the student's score is the average of the two closest scores. Reading scores are not considered in the placement decision. The Track 2 schedule consists of reading, writing, English for Academic Purposes, listening skills, a remedial mathematics course, and a course in computer literacy.

In order to proceed to full academic work, students must have a minimum 2.0 average in ESL courses. Students who do not meet this requirement may be dismissed from the program.

Two basic textbooks are used during the second semester of Track 2 reading: Academic Reading and Study Skills for International Students by Rosenthal and Rowland (1986) and Critical Thinking, Critical Choices: Book 1, Reading and Writing by Aebersold, Kowitz, Schwarte, and Smith (1985). Academic Reading and Study Skills for International Students consists of eight chapters, each focusing on an academic discipline. Each chapter contains two readings from an introductory college-level textbook from a specific field.

These readings are placed in the center of the chapter, preceded by vocabulary, dictionary, and language skills sections and are followed by comprehension and discussion questions. One shortcoming of the textbook is that, although the reading selections have been taken from college-level textbooks, they are short sections of chapters taken out of

context. The UPP reading course uses the chapters on psychology, biology, anthropology, and literature as unit topics.

Critical Thinking, Critical Choices: Book 1, Reading and Writing is an advanced ESL reading textbook consisting of six units that focuses on the central theme of environmental problems. The readings, which range from moderate to extended length, have been selected from textbooks and academic journals, such as Natural History, that are directed toward an educated audience. The exercises in each unit are devoted to activities such as notetaking, speaking in seminars, and evaluating written material.

In addition to Academic Reading and Study Skills for International Students and Critical Thinking, Critical Choices, supplementary articles from other textbooks and journals have been included as part of the course curriculum (See Appendix C). Student progress is evaluated through performance on six quizzes, a midterm, and a final examination. The quizzes are given during regular class sessions while the midterm and final are given to all students at a common sitting. During the first session, quizzes are based on materials used in classroom instruction, but, during the quiz, the students are permitted access to notes they have taken. In the second session, students are not permitted access to these notes and the quizzes are designed to match the tests they will have in the academic program.

The Rationale for the Study

The students who are studying in the ITM/MUCIA program face a formidable challenge. Within two semesters, they must overcome severe weaknesses in English and comprehend academic texts in English with sufficient competence and independence to meet the requirements of university level courses. Many reading behaviors that have made these students successful within the Malaysian school system are not appropriate for American classes. The students have been taught to memorize and have not been taught how to use strategic reading.

This situation extends beyond the ITM/MUCIA program. University ESL programs generally face the dilemma of preparing non-native speakers with major language deficiencies for academic work within an academic year or less. Given the limited period of time allocated to ESL programs to prepare students, instruction is concise, structured, and intense.

Carrell (1987; 1989) has argued that ESL reading instruction must move away from the emphasis on linguistic methodology toward an interactive approach that includes strategy use. Yet, no research has been published that either supports or disconfirms that the explicit instruction of reading strategies is effective with non-native speakers of English.

Since research on the effects of direct and explicit instruction of reading strategies on ESL readers' comprehension is lacking, the results of this study will be a

step in providing evidence of the relationship between instruction of strategic reading techniques and improved comprehension for ESL students.

In addition, research has established that the active use of reading strategies is closely associated with the metacognitive awareness, which is defined as the conscious awareness of one's knowledge and abilities, how this knowledge and these abilities can be used, why they are important, and ways in which knowledge and abilities can be monitored and controlled (Baker and Brown, 1984; Brown, Palincsar, and Armbruster, 1984; Duffy, Roehler, Meloth, Vavrus, Book, Putnam, and Wesselman, 1986; Paris and Jacobs, 1984). However, the effects that explicit instruction of reading strategies has on the development of the metacognitive awareness of ESL students has not been studied.

Since strategic reading must be taught in ESL classes within a limited time, SQ3R was selected for this study as the means of introducing reading strategies within the existing structure of the ITM/MUCIA program. The method serves as a condensed and abbreviated strategic reading procedure that integrates several strategies into a unified instructional component.

Statement of the Problem

That strategic reading plays an essential role in the reading comprehension of native English speakers has been well supported through research. However, the effects of

explicit instruction of reading strategies to ESL students has not been investigated.

ESL reading programs face the problem of preparing students with severe language problems to read and comprehend academic texts within one academic year. Furthermore, ESL students frequently view reading and studying as memorizing as much material as possible in order to pass a test.

Despite the time limits imposed on ESL programs, an academic year of intensive language instruction should result in some positive benefits for the students' comprehension and use of English. Generally, however, ESL reading classes have responded to the problem by providing an intensive linguistically based curriculum. More effective objectives in ESL reading would be to introduce the students to the practice of being strategic in reading in order to develop the students' metacognitive awareness, the conscious awareness and use of knowledge and abilities, to the point that they will reflect on and evaluate their own reading.

The motivation underlying this study was to examine the possibility that the SQ3R method could be used as an concise multicomponent strategy to teach strategic reading.

The purpose of this dissertation was to determine (a) if ESL students who receive instruction in SQ3R as an multicomponent reading strategy with training in the self-regulated use of strategic reading exhibit better reading comprehension and report the use of reading strategies more often than their control-group counterparts, (b) if ESL

students who receive instruction in SQ3R as a study skills unit exhibit improved reading comprehension and report more awareness of reading strategies than their control-group counterparts, and (c) if ESL students who receive instruction in SQ3R as a multicomponent strategy exhibit better comprehension and report more awareness of reading strategies than students who have received training in SQ3R as a study skills unit.

Research Questions

Given the research supporting the necessity of conscious use of reading strategies for effective reading comprehension and the evidence that reading abilities improve from the explicit instruction in strategic reading, this dissertation investigated the following general research question:

> What are the differences in comprehension performance between ESL university students who receive instruction in SQ3R both as a study skills unit and with a focus on developing reading strategies, and those who do not receive such instruction, and what are the differences in the strategies they report after instruction?

Six specific questions were asked. The first three questions were concerned with differences in comprehension among groups after treatment while the remaining three questions regarded differences in students' reports of their use of reading strategies:

1. What are the differences in the reading comprehension performance of ESL students who receive instruction in SQ3R with a focus on developing their use of reading strategies and a control group that does not receive this instruction?

2. What are the differences in the reading comprehension performance of ESL students who receive instruction in SQ3R in a procedural method and a control group that does not receive this instruction?

3. What are the differences in the reading comprehension performance of ESL students who receive instruction in SQ3R with a focus on developing their use of reading strategies and those who receive instruction in SQ3R in a procedural method?

4. What strategies do ESL students report using after they have received instruction in SQ3R with a focus on developing their use of reading strategies?

5. What strategies do ESL students report using after they have received instruction in SQ3R in a procedural method?

6. What strategies do ESL students report using if they have not received instruction in SQ3R either with a focus on developing their use of reading strategies or procedurally?

Significance of the Problem

This study has significance for the teaching of reading to ESL students for the following reasons.

First, despite evidence that many ESL comprehension problems result from a lack of understanding of the nature of reading rather than from language deficiencies (Block, 1986), research on the effects teaching strategic reading to ESL students has been neglected.

This study examines whether ESL students who are explicitly taught strategic reading show significant improvement in their comprehension of English texts.

In addition, ESL instruction should be more effective in meeting the needs of international students. Instruction as it is usually given does little to prepare these students for

success in academic classes. This study examines the possibility that methods which have been proved beneficial for native English speakers are appropriate for ESL students.

Furthermore, while a few studies have found a positive correlation between awareness of text features, such as text organization, with improved ESL reading performance, no instructional study has examined whether direct instruction of reading strategies results in a significant difference in ESL students' awareness and use of reading strategies.

Definitions

Awareness: Knowledge that is either present or is accessible to conscious recall and can be demonstrated, verbalized or communicated.

Explicit instruction: Instruction which directly informs students of important content, reasons to learn the content, and how to use the information from the content.

Functional text: A text, such as a textbook or journal article, that has been designed for a utilitarian or practical purpose.

Metacognitive awareness: Conscious awareness of one's knowledge and abilities, how this knowledge and these abilities can be used, why they are important, and ways in which knowledge and abilities can be monitored and controlled.

Metacognition: Knowledge about cognition and the regulation of cognition. This knowledge affects the way in

which an individual establishes and meets objectives.

Multicomponent strategy: An integrated system of strategic reading with a focus on developing the awareness and use of strategic reading. In this study, SQ3R was presented to one of the treatment group as a multicomponent strategy. This means that the subjects were taught to regard SQ3R as an integration of several strategies that can be used together or independently to resolve reading problems. Included in this system is self-monitoring of reading, recognition of problems, and a self-evaluation of comprehension.

Procedural method: Subjects are taught how to use SQ3R as a study skill, and are given practice exercises with SQ3R, but are not taught to use SQ3R strategically.

Proposition: A unit of meaning consisting of a predicate (represented by a verb, adjective, or connector) and one or more arguments (represented by nouns, noun phrases, or prepositional phrases) which are related to each other. Within longer texts, superordinate propositions represent the main ideas while subordinate propositions act as supporting material.

Questioning: A procedure in which the reader devises questions before, during, and after reading to be answered from reading. The questions may range from the general "What's the point" to locating a specific name or date. Questions may be devised by using subheadings as a basis or through a sequence of "Who, What, Where, When, Why, and How"?

Regardless, devising questions gives the reader the means to concentrate on locating important information while reading.

Reading comprehension: The process of recalling and organizing information and ideas from a text in order to reconstruct meaning through a summary or retelling.

Strategy: A term used to indicate the specific activities that can be used to resolve a problem in reading or learning; for example, looking back to discover missed information.

Strategic reading: The process of using strategies while reading; for example, the conscious act of turning back to a section and rereading. Strategic reading is the flexible, adaptable, and conscious use of knowledge about reading to remove a blockage to meaning. The use of reading strategies is a conscious activity which involves an overt procedure on the part of the reader. As a prerequisite, the reader must be conscious of a problem and aware of strategies that can be used to resolve it.

Surveying: A systematic examination of a text before reading to gain a sense of the type of information presented in the text, to anticipate the level of reading difficulty before reading in depth, and to devise strategies to resolve potential problems.

Teaching: An intentional effort involving active planning, motivation, information giving, and mediation to create specific curricular outcomes in students.

Text: A document written to convey information or ideas.

Limitations

Limitation 1: Subjects' Ethnic and Linguistic Background

The subjects in this study come from the same ethnic and language population. No claim will be made regarding the effectiveness of the treatment for ESL classes of mixed nationalities and languages.

Limitation 2: Subjects' Educational Level

Since the study has been limited to university students, no claim will be made for the effectiveness of the treatment for secondary or elementary grade levels.

Limitation 3: Subjects' Level of English

Subjects used in this study are in the advanced levels of English as a Second Language. No claim will be made for the effectiveness of the treatment for beginning or intermediate level ESL students.

Limitation 4: Treatment Instructor

The fact that both treatment groups were taught by one instructor, the researcher, is also a limitation. More research in this area will need to be conducted with groups of a wider variety of language and cultural backgrounds and with different instructors.

Limitation 5: Subjects' Cultural Background

The subjects' cultural and religious background has emphasized a passive and submissive approach to learning that may affect their reactions to a system that emphasizes an active, self-regulated approach.

Limitation 6: Lack of Instructional Observation

Because of the restricted scheduling during the term, the treatment classes were not observed by a neutral instructor.

Summary of Chapter One

The purpose of this research was to investigate the effects of teaching strategic reading through multicomponent strategy on the reading comprehension of university ESL students. To investigate these effects, SQ3R was taught to an experimental group as a multicomponent strategy in conjunction with instruction in how and why reading strategies are used, and to a second experimental group as a procedural study skills system. A control group that received no instruction in strategic reading or SQ3R was included.

The study was conducted with Malay students enrolled in a special university training program. The educational background of these students encouraged rote memorization as the best method of learning. The objective of this study was to study the effects of introducing ESL students to an active, self-regulated approach to reading. Because of the time constraints, SQ3R was selected as the method for introducing this approach.

This dissertation has implications for future research in the effects of teaching strategic reading to ESL students as well as in the development of reading courses that better meet the needs of ESL students.

Organization of the Remainder of the Dissertation

The remainder of this dissertation will be organized into four chapters.

Chapter 2 discusses ESL instruction and reviews research in strategic reading and SQ3R.

Chapter 3 describes the design of the study, including the subjects, treatments, data gathering procedures, and the analyses performed on the data.

Chapter 4 presents the findings of the study.

Chapter 5 discusses the results and implications of the findings to reading instruction in university ESL classes.

CHAPTER TWO

REVIEW OF RELEVANT RESEARCH

This dissertation examined the effects of teaching reading strategies on the reading comprehension and the reported use of reading strategies by university ESL students. To investigate these effects, SQ3R was taught to one treatment group as a multicomponent strategy with a focus on the self-regulated use of strategic reading, and procedurally to a second treatment group as a study skills unit. A control group that received no instruction in SQ3R or strategic reading was included.

The study was conducted with a group of Malay students enrolled in a university cooperative program in Malaysia. The educational background of these students encourages rote memorization with no training in strategic reading.

The purpose of this dissertation was to study the effects of introducing ESL students to the use of reading strategies. While research conducted with native English speakers supports the necessity of explicit instruction in using reading strategies, research in this area has not been conducted with ESL students. SQ3R was selected as a multicomponent strategy to introduce this approach.

The remainder of this chapter surveys the research in reading instruction in ESL classrooms, strategic reading and comprehension, and the SQ3R method.

Section One

Reading Instruction in ESL

Introduction

Effective reading instruction operates from a theoretical model of the nature of reading comprehension and how reading should be taught which provides the basis for objectives and instructional procedures in curriculum design as well as the rationale for the type of materials and techniques that will be employed in the classroom.

ESL instruction has been based on a model that views reading as a decoding process in which the reader replicates an author's intended meaning through recognition of words and sentence structures (Carrell, 1988). The foundation for this approach was the linguistic theory that language acquisition is prerequisite to language learning. "Language acquisition" is the process of developing language through experience and imitation during which minimum attention is given to the "rules" of language. "Language learning" refers to the direct teaching of the rules which are consciously applied to language. With learning, one monitors language to correct errors (Krashen, 1987).

The original theoretical foundation of ESL was that language is a hierarchy of competencies in which reading is subordinate to speaking and listening; that is, whereas spoken language is acquired before rules have been learned, reading is a learned component which is based on the acquired language, and which cannot be introduced until competence in

spoken language has been developed.

The assumption in ESL has been that the focus in reading instruction is to teach vocabulary along with patterns of word form transformations, and to provide students with a means of systematically applying linguistic rules to a text to decode the written language. Therefore, ESL reading instruction has favored a "bottom-up" approach in which the essential classroom activities have been extensive practice with grammar and vocabulary. Reading comprehension has been viewed as the product of linguistic monitoring during which the reader applies knowledge of language structure and vocabulary to a text in order to decode meaning.

The role of the ESL reading instructor has been influenced by these assumptions. ESL teachers generally perceive their responsibility to be the dispensation of the rules of language and the introduction of vocabulary to the learner. Once the learner has the rules and the words, competent language use naturally follows. The priority in the ESL classroom, therefore, has been to focus on introducing vocabulary, practicing with word forms and English grammar, and on correcting learner errors.

While some ESL research has disputed this model and has recommended that reading instruction break away from the strict linguistic mode and incorporate instruction in reading strategies into the ESL reading curriculum (Clarke and Silberstein, 1978; Clarke, 1980; Carrell, 1987), ESL instruction remains devoted to form and linguistic accuracy.

Research on Classroom Instruction in ESL

Although research has been devoted to discovering the means by which students learn a second language, few studies have dealt with what actually occurs in ESL classrooms, particularly at the university level. Generally, the research suggests that ESL teachers at all levels focus instruction on linguistic forms, evaluate students on their ability to replicate language structures, and give limited opportunities for students to produce language (Brock, 1986; Brown, 1990; Long, 1983; Long and Sato, 1983; Mendelsohn, 1981; Schinke-Llano, 1983). Dinsmore (1985) concluded that ESL instruction involves mostly "time-passing" activities with little meaningful learning.

In a study of ESL instruction given to elementary level children in bilingual programs, Campoverde (1985) concluded that the underachievement of these children in English medium classrooms was a result of the inadequate language instruction during which linguistic structures of English were taught with no regard to the children's conceptual development.

Research also indicates that consideration of reflective thinking about language occurs neither explicitly nor indirectly in ESL classrooms. For instance, the type of questions given to students in a class can be a means of developing language awareness and use. Long and Sato (1983) conducted a study on the form and functions of teacher questions directed toward elementary level ESL students in

regular classrooms. They found that these questions significantly focused on display, calling for simple one or two word answers, for example:

Teacher: What color was the car?

Student: Blue

Teacher: Right

Referential questions, which call for contextual information about situations, events, actions, purposes, and relationships, were not directed to ESL students, both within and outside of formal classroom activities. Referential questions are usually followed by further related questioning, for instance:

Teacher: Why did he take the blue car?

Student: Because he liked it?

Teacher: How do you know he liked it?

Long and Sato conclude that, by encouraging the ESL student to go beyond a simplistic display, referential questions are a means of encouraging and developing active use of language.

Chan (1988) also suggests that referential questioning can be a powerful means of teaching strategic reading to ESL students, particularly when the instructor explains the function of the questions and shows students how they themselves can use self-generated questions as a strategy in independent reading.

In an observational study, Brown (1990) discovered that the reading instruction in the ESL classes of a large

American university was devoted to requiring students to memorize vocabulary lists and complete exercises in grammar based textbooks. Little actual instruction was observed, and no attention was given to strategic reading. The study also noted that the ESL instructors were primarily graduate assistants with minimal background or experience in teaching either ESL or reading.

Recent Research on Factors Affecting ESL Reading

While not disputing that students need knowledge of vocabulary and grammar to read successfully, recent research in ESL reading has been exploring other factors that affect successful reading comprehension, such as English text organization.

In a study investigating differences in the recall of expository English among native-English, Japanese, and Spanish speakers, Connor (1984) proposed that there may be patterns in a reader's awareness of text organization which correlates with the recall of important information, and that ESL students might not be aware of the organization common to English expository texts and, therefore, have difficulty recognizing, retaining, and recalling the content.

She reported that while native-English speakers performed better than all ESL students in total recall, no significant differences among the groups were found in the recall of main points; the differences were that native English speakers recalled more supporting details of the

passage than did any of the ESL subjects. Connor suggests that ESL reading courses include instruction in text organization and the relationship between main ideas and supporting details.

Carrell (1984) studied the effects of organization of different types of expository prose on the reading comprehension of university ESL readers of different language backgrounds. She proposed that the organization of expository text affects the reading recall of ESL students, that the effect of differences of various language backgrounds are related to differences in the organization of expository texts, and, finally, that a relationship exists between the ability of ESL readers to recognize and utilize organization and the amount of information that is recalled from an expository text.

Carrell assigned advanced ESL students from four language groups (Spanish, Arabic, Oriental, and Other) to read one of four versions of a text. The versions consisted of a passage on the effects of the loss of body water that had been written into four types of discourse: description, causation, problem/solution, and comparison. The students read the passage then wrote down everything in complete sentences that they could remember from the text. In the second session, 48 hours later, the students again wrote down everything they could remember from the text and were given a fill-in-the-blank quiz. The written summaries were scored according to the number of ideas recalled and were then

classified as to discourse type in order to compare each's subject's use of discourse with the discourse type in the text.

Her results showed that immediate recall of information was significantly higher than delayed recall for all groups except the Oriental, that recall was significantly better with description, causation, and problem/solution than with comparison, that various discourse types had different effects on the recall within the four groups, and that students who duplicated the discourse type of the text they read had better recall than those who used a different discourse type.

In a later study with intermediate level university ESL students, Carrell (1985) examined the effects that training in text structure has on ESL students' reading comprehension. A treatment group was given training in recognition and strategic use of four types of expository discourse (description, causation, problem/solution, and comparison) and practiced with sample texts. A control group worked through the same texts, but with no training in recognition and use of text structure. Testing consisted of reading a text, writing an immediate summary, and identifying text types.

After the training sessions, the experimental group were able to recognize and use text structure types showing that the training sessions were effective in increasing reading comprehension. In addition, Carrell reported that the

treatment group's test means were significantly higher for all levels of ideas units.

In 1987, Carrell reported the effects on ESL reading comprehension of cultural-specific schema and content schemata Carrell suggested that texts of culturally familiar content are easier to read and comprehend than are texts with culturally unfamiliar content (cultural specific schema), and that texts with familiar organization are easier to read than are texts with unfamiliar organization (formal schema).

Two samples of high-intermediate university ESL consisting of Muslim and Catholic students read two religiously oriented texts (Islamic and Catholic), each using the historical narrative structure. Each text was matched with an alternate text with modified chronological order. Each group was given two texts, one with Catholic orientation and the other with an Islamic focus. In addition, within each group, half of the subjects read the texts written in standard rhetorical structure, while the other half read the structurally modified texts. Students were given a multiple-choice test after reading each text.

The results supported Carrell's assertion that conditions of familiar content with familiar structure encourage successful reading comprehension, while unfamiliar content with unfamiliar structure result in poorer comprehension. In mixed conditions, familiar content with unfamiliar structure resulted in significantly better comprehension than unfamiliar content with familiar

structure. Carrell concluded that familiar content is generally more important for reading comprehension than text structure, except in situations that demand an understanding of structure, such as the correct sequence of events in a narrative.

Research on Strategic Reading in ESL

While the use of strategies by native speakers has been shown to improve reading comprehension, little research has been conducted to study the degree to which teaching reading strategies affects second language reading comprehension. Connor (1987) has observed that, as of 1987, only three studies dealing with teaching reading in ESL classes have been published while studies in this area with native English readers are numerous. No evidence exists that empirical research studying the effects of teaching SQ3R on the comprehension of ESL students has been conducted.

An observational study of elementary students by Knight, Padron, and Waxman (1985) indicated that monolingual English speakers use twice as many strategies while reading English as bilingual Spanish speakers. However, no attempt to teach strategies was used with this study. Interestingly, the two strategies cited by the bilingual students as being most important to them in reading were attempting to determine what the teacher wanted to know and using correct decoding techniques.

In a more recent study, Padron and Waxman (1988)

examined the relationship between Hispanic ESL students' reported use of cognitive reading strategies with narrative texts and their performance on measures of reading comprehension. According to the authors, the most frequently reported strategies were (1) asking questions about what was not understood, (2) reviewing after reading, (3) imagining the story after reading, and (3) looking for definitions of unknown words in a dictionary. The least reported strategies were (1) reading fast, (2) thinking of something else while reading, (3) writing down words, and (4) skipping difficult sections.

In their analysis, three variables were found that predicted posttest achievement. Pretest performance was the best positive predictor for posttest performance while thinking about something else and repeating the main idea were found to be negative predictors; that is, the more frequently students reported these two strategies, the lower their posttest achievement.

The authors concluded that ESL student perceptions of the cognitive strategies that they use have predictive validity for their reading comprehension. Furthermore, they state that the findings support previous research that has found that lower achieving students use less sophisticated and inappropriate cognitive reading strategies during reading. Finally, they conclude that the results support the use of self-report measures by classroom teachers to assess students' cognitive strategy use in reading.

O'Malley, Chamot, Stewner-Manzanares, Russo, and Kupper (1985) conducted a study to identify learning strategies associated with a range of ESL tasks, and to study the effects of learning strategy training on ESL students' vocabulary, listening, and speaking. The authors proposed that students who receive instruction in using a combination of metacognitive, cognitive, and/or socioaffective strategies would perform better than students who do not receive instruction in using metacognitive strategies, and that students who receive instruction in a combination of cognitive and/or socioaffective strategies would perform better than students in a control group. The results demonstrated that strategy training with ESL listening and speaking skills significantly improved students' abilities in these areas and that classroom instruction in strategies facilitated learning. The authors recommended that future research be directed at refining strategy training methods, determining specific metacognitive strategies for language tasks, and strengthening the effects of strategy training on student learning and transfer.

In a descriptive study by Block (1986), the reading strategies used by ESL students who had been designated as poor English readers were compared to those used by native English speakers who had been identified as poor readers. Block suggested that readers of any language background use two different modes of approaching reading. In the reflexive mode, the reader relates to the text personally and focuses

on one's own thoughts and feelings, rather than on the text. In the extensive mode, the reader attempts to deal with the information conveyed by the author and, therefore, focuses on understanding.

In Block's study, nine freshman university students, who had been placed in remedial reading courses, were used. Three of the students were native speakers of Chinese, three of Spanish, and three of English. All nine subjects were given two selections taken from an introductory psychology textbook and were asked to "think aloud" as they read the passages. They were directed to report exactly what they were thinking while reading and were cautioned against analysis or explanation. The subjects were then tested with two comprehension measures: an oral retelling and a multiple-choice test.

Block reported that the results indicated language background did not seem to account for differences strategy use or test performance. No patterns of strategy use were observed that distinguished native speakers from non-native speakers or one group of non-native speakers from the other. Moreover, performance on both the retelling and multiple choice test was not significantly different among language backgrounds.

Results of retellings followed a similar pattern as strategy use: stating a thesis, mentioning main ideas, and identifying support varied among the subjects, but with no distinction among language groups.

Block concluded that the differences among individuals were a reflection of an awareness of reading strategies rather than language background, and suggested that ESL students transfer their knowledge of strategies to reading in English.

These studies, while suggesting factors that affect ESL reading comprehension, do not deal with the instruction nor with independent use of reading strategies. In strategic reading, the student controls strategy use, but in each of these studies, student control of reading was compromised by assigning materials which aided comprehension. While Carrell's results, for instance, showed that an awareness of text structure and organization improves ESL reading comprehension, the subjects were not taught to use this knowledge independently as a strategy. Furthermore, Carrell recommends that the use of text organization in reading be a teacher initiated activity used as an advanced organizer for activating schema for a particular task rather than as a general independent strategy.

Summary of Section One

ESL reading has traditionally operated from a structured, linguistic model that views reading as being subordinate to the spoken language. ESL reading instruction has been devoted to teaching decoding skills. Classroom instruction in ESL reading has been devoted to practice and drill with vocabulary and grammar, and has ignored strategic

reading. Nevertheless, recent ESL research has disputed the traditional approach, suggesting that factors other than linguistic competence affect ESL reading comprehension.

While the research on the effects of teaching strategies to ESL students is limited, the few studies that have been conducted support the assertion that strategy use improves reading comprehension. Nevertheless, research on the effects of teaching strategic reading to ESL students has not been conducted.

Section Two

Strategic Reading and Comprehension

A theoretical model that is presently influencing reading research and instruction asserts that a reader, through active mental processes, utilizes the form and structure of text to interact with knowledge sources to generate meaning (Rumelhart, 1977; Samuels and Kamil, 1984; Garner, 1988). Reading is not a precise application of decoding skills focused on a sequence of words, spelling patterns, or sentence structure. Information from a text is processed through the reader's schemata, knowledge that has been stored in memory, and becomes in turn part of the reader's knowledge store.

Reading comprehension depends on the awareness and the appropriate use of strategies that permit the reader to effectively sort out, evaluate, and organize the information from a text (Beck, 1989). This means that, while reading is a

process of seeking meaning, the reader does not discover meaning in text: text is interpreted to arrive at meaning. The key to comprehension is the ability of the reader to apply experience, schemata, and knowledge of the language to the reading task in order to construct meaning. The application of these features is strategic reading (Duffy and Roehler, 1986; Paris, Lipson, and Wixson, 1983).

Strategic reading is an activity during which readers consciously apply what they know about reading to a text in a certain situation in order to construct comprehension. For example, a student recognizes that a chemistry textbook is written differently than Time magazine and consciously modifies reading behavior according to the content and purpose of each.

During the reading process, the reader organizes information from the text in relation to schemata and refers to this knowledge to predict outcomes and to confirm or reject these predictions. This interaction of new information with previously learned knowledge produces comprehension. Thus, comprehension depends on the amount of relevant topical information that is already known by the reader as well as the reader's competence with the language (Adams and Collins, 1979; Armbruster, Echols, and Brown, 1982).

A native English speaker's reading comprehension, therefore, is less dependent on linguistic analysis, such as word recognition and syntax transformation, than on

information processing in which the reader refers to knowledge and experience in order to make predictions which are then confirmed, modified, or rejected (Adams and Collins, 1979; Anderson and Pearson, 1984; Carroll, 1970).

Reading, therefore, is not a precise application of language skills focused on an exact and sequential perception of linguistic units, but is an interactive process between the reader and a text during which the reader attempts to correlate input with existing information. Comprehension involves organizing the information in a text in terms of the information that is available to the reader.

The Role of Metacognitive Awareness in Reading

Reading strategies are frequently discussed in the context of metacognition. This term refers to the knowledge and monitoring of one's own cognitive processes (Flavell, 1976; Wade and Reynolds, 1989).

Baker and Brown (1984) suggest that metacognition consists of two components: knowledge and self-regulation. Knowledge is the awareness of the skills and strategies needed for successful performance, while self-regulation refers to the effective use of these skills while performing the activities. In this context, strategic reading becomes a metacognitive activity that is characterized by (1) the recognition of a comprehension problem, (2) selection of a strategy to resolve the problem, (3) application of the strategy to the problem, and (4) the evaluation of the

results (Paris, Lipson, and Wixson, 1983; Nist, Simpson and Holgrebe, 1985; Pitts, 1983; Wade and Reynolds, 1989).

Metacognitive awareness is described as the conscious knowledge of one's thinking while performing specific activities, such as reading, and using this knowledge to control what one is doing (Brown, 1978).

Three types of knowledge have been identified that are relevant to metacognitive awareness (Marzano, Brandt, Hughes, Jones, Presseiren, Rankin, and Suhor, 1988; Paris, Lipson, and Wixson, 1983). First is declarative knowledge, which consists of the facts and concepts that one knows; in other words, the "what" of knowledge. Procedural knowledge is the awareness of activities that are needed to perform a task; in short, the "how". Finally, conditional knowledge is being aware of appropriate contexts and conditions during which one applies a certain procedure, that is the knowledge of "when" and "why".

Wade and Reynolds (1989) have identified three subcategories of metacognitive awareness: task awareness, strategy awareness, and performance awareness. Task awareness refers to the recognition of what to study during a reading task. Before reading, the student establishes a reading purpose and makes decisions about the type of information that is essential to learn in order to meet this purpose. For example, a student who is certain that information in a textbook chapter will be included in a unit test establishes "test preparation" as the reading purpose,

decides that type of information that is necessary to know for this test, and selects strategies that will effectively help the student find, understand, and remember the necessary information. The student realizes that attempting either to learn every item of information or recall only random items of information is ineffective.

Students are engaged in task awareness when they review their knowledge of the topic and survey a text to establish categories of important information on which they will focus attention, such as main ideas, definitions, and key examples. Wade and Reynolds note that it is important for students to distinguish between internal criteria of importance, information that is interesting or personally relevant to the reader, and external criteria of importance, information essential for a particular task. Effective readers consciously allocate time and attention to information that meets the external criteria of importance.

Strategy awareness refers to decisions of what specific strategies to use before and during reading, such as surveying to anticipate the various organizational signals an author uses or devising questions to be answered while reading. This type of awareness may be divided into subcategories of "Observable Study Methods", which would include underlining, highlighting, notetaking, and outlining, and "In-the-head Study Methods, such as previewing, predicting content, looking back, relating information to what is already known, and self-questioning.

With performance awareness, students monitor their reading to determine both the degree of comprehension and the success of the strategies that they are employing. Wade and Reynolds note that students may report using strategies, or even appear to be using strategies, without improving comprehension. This final subcategory directs the student consciously to monitor the extent to which reading has been successful.

Research suggests that good readers have different metacognitive awareness of the purpose of reading and the types of strategies used during reading than poor readers do (Brown, Palincsar, and Ambruster, 1984), and that poor readers' metacognitive awareness and reading comprehension can be improved by explicit instruction of reading strategies (Duffy, Roehler, Meloth, Vavrus, Book, Putnam, and Wesselman, 1986).

Efficient readers reflect on their purposes and objectives of reading, select and use strategies consciously while reading, and monitor their performance during and after reading. The essential element is self-activated and self-regulated activity. Thus, transition from other-regulated activities, those controlled by teachers, to conscious self-regulation is essential in developing effective readers.

An example of one type of metacognitive awareness is using text structure as a comprehension aid while reading. At the middle school level, Richgels, McGee, Lomax, and Sheard (1987) found that students who are aware of different

types of text structures, such as comparison/contrast, causation, and problem/solution, are likely to use this knowledge as an aid to comprehension while they are reading.

Similarly, Ohlhausen and Roller (1988) examined the operation of text structure and content schemata both in isolation and as they interact with both children and adults. They found that, in schema accessibility conditions, readers use the accessible schema to identify important information and, furthermore, that readers perform better with two accessible types of schemata, such as knowledge of text structure and familiarity with content, than they would with only one. In addition, they reported that structure and content schemata show a developmental trend based on age and, finally, that readers are aware of the type of schema they use.

In a study of a different area of metacognitive awareness, Rowe and Rayford (1987) reported that readers will activate their own background knowledge in response to questions given before reading. The authors found that a broad range of students from the elementary to the secondary school levels can use prereading questions as cues to activate background knowledge, but that these questions may differ in their value as cues depending on how they are written.

A means of developing metacognitive awareness in students proposed by Raphael (1984; 1986) is instruction in self-questioning. Rather than depend on teacher generated

pre- and post reading questions, students can be taught to formulate their own questions before and during reading. Raphael suggested using three processing levels for question-answer relationships (QARS): Text explicit, text implicit, and experienced based. Renaming each of the levels to aid student understanding, Raphael describes text explicit ("right there") questions as those in which answers can be found directly from the text. With text implicit ("think and search") questions, answers are available from text, but the wording of the questions differs from the language in the text. Finally, experienced based ("on my own") questions depend on information not found directly from the text.

Chan (1988) has recommended teaching self-questioning in ESL classes as a means of developing metacognitive awareness. She suggested that self-generated questions actively involve the student with text by (1) activating schema that is relevant to the text, (2) setting a purpose for reading, (3) directing attention to the important ideas in a text, and (4) anticipating difficulties and selecting strategies to deal with these difficulties.

The Role of Strategies in Reading

A Description of Strategic Reading. For this study, "strategy" is used to indicate a specific activity that can be used to resolve a problem in reading or learning; for example, looking back to discover missed information. "Strategic reading" will be used to indicate the process of

using these strategies; for example, the conscious act of looking back to clarify understanding.

Duffy and Roehler (1986) have defined strategic reading as the flexible, adaptable, and conscious use of knowledge about reading to remove a blockage to meaning. It is noteworthy that Duffy and Roehler, as well as Paris and Myers (1981), describe the use of strategies as a conscious activity which involves an overt procedure on the part of the reader. As a prerequisite, the reader must at least be conscious of a problem and aware of strategies that can be used to resolve them.

Since strategic reading is defined as the overt application of strategies to a reading problem which involves recognition of a difficulty, knowledge of the strategies that can resolve the difficulty, and conscious application of the strategies to the difficulty, spontaneous or unconscious actions of which the reader is unaware while reading are excluded. Under these circumstances, automatic corrections unconsciously made while reading would not be considered strategies.

The implication of this view is that strategies are overt and observable behaviors which can be taught and, since strategy use improves reading comprehension, teaching strategies is a means of improving comprehension (Baird and White, 1984; Cohen, 1985; de Klerk, 1987; Dermody, 1988; Gilbert, 1986; Palincsar, 1985; Rinehart and Platt, 1984; Simpson, 1986; Tei and Stewart, 1985).

One difficulty in discussing strategies is the number of activities that have been identified as strategies. A sample of the literature includes:

1. Outlining (Nist, Simpson, and Holgrebe, 1985),
2. Summarizing (Dermody, 1988; Knight, Padron, and Waxman, 1985; Nist, Simpson, and Holgrebe, 1985),
3. Self-generated questions (Palincsar and Brown, 1989; Rakes and Scott, 1983; Raphael, 1984; Tomlinson, 1987),
4. Use of text structure (Beck, 1989; Berkowitz, 1986; Chaffee, 1985; Tei and Steward, 1985),
5. Use of text organization, (Spyridakis and Standal, 1987),
6. Paraphrasing (Cioffi, 1986),
7. Consulting other sources (Davey and Porter, 1982)
8. Monitoring comprehension (Baker and Anderson, 1982; Gilbert, 1988; Paris and Myers, 1981),
9. Making predictions about content before reading (Dermody, 1988; Olshavsky and Kletzing, 1979; Palincsar and Brown, 1989),
10. Reviewing after reading (Knight, Padron, and Waxman, 1985; Palincsar and Brown, 1989),
11. Notetaking (Duffy and Roehler, 1986; Pitts, 1988),
12. Looking back while reading (Cioffi, 1986; Smith, 1985),
13. Focusing attention (Palincsar and Brown, 1989),
14. Mental imagery (Gambrell and Bales, 1986), and
15. Drawing inferences (Pearson and Gallagher, 1983; Wilson and Hamil, 1982).

The Distinction Between Study Strategies and Repair Strategies. One method of organizing strategies into a coherent system has been to classify them into two categories: study strategies and repair strategies (Armbruster, Echols, and Brown, 1982; Duffy and Roehler, 1986). Study strategies are used by students to facilitate text processing and memory. Examples of these include previewing, highlighting, notetaking, or summarizing. These are broad and general strategies that are used primarily to anticipate and avoid possible blockages to meaning before and during the reading activity.

Care must be taken, however, to be certain that these activities are strategies for the purpose of facilitating memory and comprehension, and are not merely techniques that have slight relevance to successful reading. For instance, the university student who highlights as a strategy must be conscious of the reason and propriety of highlighting. That is, the student highlights an item after consciously assessing the importance of the item to the overall reading task. Randomly highlighting sections of a text because they may "look important" would be considered a "technique" rather than a "strategy" (Armbruster, Echols, and Brown, 1982).

Research has shown that training in study strategies is effective in improving comprehension. A study by Rinehart, Stahl, and Erickson (1986), for example, concluded that training in writing summaries at the sixth grade level is an effective means of improving reading and study skills.

Researching the use of reading strategies at the university level, Spyridakis and Standal (1987) examined the effects of three signal devices, headings, previews, and connectives, on the reading comprehension of sophisticated readers. The authors found that all three signal types enhanced comprehension, but the extent depended on text length and difficulty. Shorter, easier passages produced higher scores than longer, more difficult ones. The passage that was most appropriate for the readers in length and difficulty produced the clearest effect for signals.

Repair strategies, which are also called "fix-up" strategies, are used when comprehension fails during reading. The reader consciously makes several decisions beginning with whether or not strategic action should be taken and then considers the available options. These options include "lookbacks", a quick skimming of relevant sections of the text, storing the problem as a potential question that will be answered later, or using available information to infer meaning, or consulting another source.

The Effects of Teaching Strategic Reading. In general, students at all academic levels, from elementary through university, have shown improved comprehension after instruction in the use of reading strategies. Furthermore, Paris, Cross, and Lipson (1984) have demonstrated that metacognitive awareness can be promoted by direct instruction, and that this increased awareness leads to better strategy use.

Simpson (1984) has suggested that students lack independent reading strategies because they either have not been taught these strategies or, if aware of strategies, they do not know how to apply them, and, therefore, students are unable to self-regulate their reading. Yet, ample evidence exists that direct instruction of both study and repair strategies has a positive effect on reading comprehension (Brown, 1981; Baumann, 1984; Hare and Borchardt, 1984; Roehler and Duffy, 1984; Smith and Dauer, 1984; Smith, 1985; Montague and Tanner, 1987). Several studies have been conducted that support the effectiveness of teaching strategic reading procedures (Hansen and Hubbard, 1984; Holmes 1983, 1985; McCormick and Hill, 1984; Paris, Wasik, and Van der Westhuizen, 1988; Short and Ryan, 1984). Generally, the literature recommends building adequate background knowledge, teaching the learner to relate this knowledge to text while reading, and instruction on how to make predictions and self-monitor while reading (Weinstein, 1987).

In a study on the effects of teaching text organization to 6th grade students, Berkowitz (1986) found that the subjects' recall and comprehension were significantly improved after instruction of use of organizing ideas as a framework for studying.

Armbruster, Anderson, and Ostertag (1987) studied the effects of teaching text structure on fifth grade students' ability to learn similarly structured material. They

reported that training in text structure improved recall of main idea information required for an essay test, but did not significantly improve a recall of specific information required by a short answer test. In addition, they found that training in text structure improved the subjects' ability to include more main ideas in a written summary and to write better organized summaries

In a study to examine the effect of teaching inferential strategies to fifth grade students, Dewitz, Carr, and Patberg (1987) reported significant improvement in both reading comprehension and comprehension monitoring after six weeks instruction. Furthermore, the effects continued for some time after instruction and transfer to unfamiliar texts.

Duffy, Roehler, Meloth, Vavrus, Book, Putnam, and Wesselman (1986) have shown that students do not intuitively acquire strategic reading and that teacher intervention has significant influence on student behavior. Teachers who were trained to be explicit while teaching elementary level children how to use reading skills produced significantly greater student awareness of what they were being taught and better student performance on achievement measures. Specifically, the teachers were trained to tell their students the strategy being taught, how the strategy is used, and the situation during which the strategy would be used.

In a study designed to investigate the effects of directly explaining the mental acts associated with strategic reading in classroom situations, Duffy, Roehler, Sivan,

Rackliffe, Book, Meloth, Vavrus, Wesselman, Putnam, and Bassiri (1987) reported that teachers can learn to be more explicit in explaining the reasoning associated with using basal text skills as strategies, that explicit teacher explanations increases low-group students' awareness of both lesson content and the need to be strategic while reading, and that explicit teacher explanations increases low-group students' conscious use of skills as strategies, leading to greater reading comprehension.

However, as Duffy and Roehler (1989) have pointed out, the act of explicitly treaching strategic reading is not a magic bullet that instantaneously resolves all reading problems. They observe that, while strategies can be effectively taught, strategy instruction is difficult for several reasons. First, students must restructure their own understanding of successful reading in light of the new information. Moreover, curricular demands may interfere with the objectives of strategy instruction. Finally, teachers' instructional behaviors must be sensitive both to student understanding and misunderstanding of the process. They conclude that successful strategy instruction demands not only teacher awareness and instructional consistency, but a long range of time for the students to integrate the process into their learning habits.

At the university level, Smith (1985) has concluded that when competent college level readers approach difficult and unfamiliar reading material, they employ strategies that they

have accumulated over years of successful study.

Lundeberg (1987) conducted a study to test the theory that university level students who are novices in their field of study can be taught to use reading strategies employed by experts and improve their reading comprehension of legal materials. Identifying six general reading strategies used by legal experts, but not by law students, when reading legal documents (use of context, overview, analytical rereading, underlining, synthesis, and evaluation), he conducted a series of experiments with law students to test the effects of teaching the experts' strategies on the reading comprehension of students with limited experience with legal documents. Lundeberg's results showed that instruction in the use of experts' strategies significantly improved reading comprehension of the novices.

Swafford and Alvermann (1989), in a survey of research on reading strategies conducted with postsecondary students, found that seventy percent of the studies involved prereading organizer strategies while twenty-five percent dealt with the use of text structure. The authors note that while the overall research indicates that teaching reading strategies to university level students is effective, serious weaknesses in many of the studies renders their conclusions questionable. First, in several studies the subjects were not told why they were using a strategy or how to use it. In addition, although university students are required to read extensive amounts of material over an extended period of

time, the passages used in the research were usually brief and the effectiveness of the strategies were measured only once, immediately after subjects had read the selection. Finally, few studies indicated the reading competence of the subjects.

Summary of Section Two

Research has shown that reading comprehension is improved by the conscious use of reading strategies. Despite some confusion over identifying specific strategies, studies have shown that reading strategies can be taught to students at all levels and that instruction in strategies usually results in improved comprehension.

Section Three

Using SQ3R as a Multicomponent Strategy

A Description of SQ3R.

SQ3R (Survey-Question-Read-Recite-Review), devised by Francis P. Robinson (1941; 1970) as a study system, has been shown to be useful with functional texts (Duffy and Roehler, 1986; Kopfstein, 1982; Reed, 1987; Simpson, 1986; Snyder, 1984; Tadlock, 1978; Tomlinson, 1987; Whittaker; 1981). The SQ3R method guides students to become actively involved in establishing the purpose for reading, provides them with an idea of the complexity of the material, encourages them to focus their attention while reading, and develops a habit of reviewing. With SQ3R, students are engaged in questioning,

summarizing, using headings and text organization, and review.

The SQ3R method consists of five steps: Survey, Question, Read, Recite, and Review. The survey is a systematic examination of a text during which the student first notes the title, the author, and the date of publication. This is followed by an examination of headings and subheadings, information in charts, graphs, and pictures, and sections in boldface or italics. Finally, the student reads the first paragraph, the first sentence in each subsequent paragraph, and the final paragraph. By surveying, the reader can gain a sense of the type of information presented in the text, anticipate the level of reading difficulty before reading in depth, and predict the information that will discovered in the text.

Questioning follows the survey. With this step, the reader produces questions that may be answered from reading. The questions may range from the general "What's the point" to locating a specific name or date. Questions may be devised by using subheadings as a basis or through a sequence of "Who, What, Where, When, Why, and How"? Questions may also come from the text itself or from study guides provided by the instructor. Regardless, producing and using questions give the student the means to focus on locating specific information.

While reading, students actively seek answers to their questions. When they have finished reading, the students

recite, by producing a summary of what they have read. Finally, the students review the text to confirm their understanding.

Research on SQ3R Effectiveness.

Although well received during the 1960's (Courtney, 1965; Durr, 1963; Johnson, 1964; Spache, 1963; Van Gilder, 1967), SQ3R has recently been a center of some dispute. Johns and McNamara (1980) contend that empirical evidence supporting the effectiveness of the method has been meagre. While not denying the usefulness of SQ3R, they conclude that more research should be conducted. Gustafson and Pederson (1984) concurred with Johns and McNamara, although in an update (Gustafson and Pederson, 1985), while retaining reservations about research methodology, modified their earlier concerns by conceding that the evidence supports the effectiveness of SQ3R at the university level.

More recent research has supported the effectiveness of the method. Studies by Adams, Carnine, and Gerten (1982) and Hodges (1982) found significant improvement in reading comprehension of intermediate grade students after instruction in SQ3R, while Whittaker (1981), Snyder (1984), Simpson (1986), Reed (1987), and Tomlinson (1987) have shown that instruction in SQ3R improves comprehension for university students. Kopfstein (1982) concluded that while SQ3R is a sound procedure, it has been so poorly taught that students fail to use it independently.

Teaching Strategic Reading with SQ3R

While SQ3R is an established study skills method, it has not been used specifically for teaching strategic reading. The method is typically introduced in developmental reading textbooks as a self-contained unit which is taught as a series of skills without reference to reflection or self-monitoring.

Nevertheless, SQ3R lends itself to being used as a multicomponent strategy if supplementary instruction and practice are provided that guide the student toward monitoring and evaluating reading performance. As Tomlinson (1987) observed, SQ3R provides an opportunity to enhance students' metacognitive awareness of the organization and demands of a text.

To develop a self-regulating approach to reading, Palincsar and Brown (1989) recommend six strategies that encourage metacognitive awareness in reading:

1. Clarifying purpose of reading to determine the appropriate approach to the task.
2. Activating background knowledge.
3. Focusing attention on major content.
4. Evaluating content critically for internal consistency and compatibility with prior knowledge.
5. Using monitoring activities such as self-questioning and paraphrasing.
6. Drawing inferences, such as predictions and interpretations, and testing them.

Each of these strategies can be addressed through SQ3R as a multicomponent strategy. First, during the survey step, the teacher can direct students to recall information they already know and to relate it to the text before reading, to look at text headings, charts, pictures, boldface and italicized items in order to predict the nature and difficulty of the content, and to reflect on the results of the survey to establish the purpose for reading.

With the questioning step, the teacher encourages readers not only to devise questions that will be answered while reading, but to focus their attention to the text structure and organization.

While reading, the students are directed to monitor their comprehension while referring to the questions they devised in the preceding step, to look back when they realize that comprehension has broken down, and to use text organization and structure as comprehension aids.

During the reciting step, the students produce a written summary which they use as a means of evaluating their comprehension. Finally, in the review step, the students skim the material to confirm their conclusions, to resolve remaining problems, and to evaluate their understanding.

When teaching SQ3R procedurally, the instruction is limited to informing the student of what to do, and does not address how, when, what, or why, nor does procedural instruction encourage self-monitoring and self-evaluation. As Kopfstein (1982) observed, for SQ3R to be most effective,

students must understand the purpose of each step, be given opportunity to practice and evaluate the method, and to accept SQ3R as a viable tool for enhancing comprehension.

Summary of Chapter Two

Although research has shown that teaching reading strategies facilitates comprehension and enhances the metacognitive awareness of native English speakers, research on the effects of these factors on the reading comprehension of ESL students has not been conducted.

Research does show that ESL reading instruction generally ignores strategic reading and metacognitive awareness while emphasizing drills in linguistic structures and word-attack skills, and frequently using materials that have little relevance to academic reading. Furthermore, since ESL teachers tend to evaluate ESL students on their facility with structures rather than their grasp of meaning, students are provided with few opportunities to learn or practice strategic reading techniques. This type of instruction limits learning to one dimension of reading, depriving students of other options that can improve comprehension. Effective reading in both native and second language calls for the student to be aware of the strategic options, such as reviewing what one knows about a topic before reading, or anticipating what types of information might be important, and to apply these options independently.

An established method of guiding students to establish

reading purpose, predict content, and actively monitor reading is SQ3R. Although SQ3R has been used with native English speakers since 1941, research on the effects of the method with ESL students has not been conducted.

SQ3R was not originally devised with strategic reading as an objective; however, the method may be used as a multicomponent strategy when taught with the objective of establishing strategic awareness and self-monitoring.

CHAPTER THREE

DESIGN AND METHODS

This dissertation examined the effects of teaching strategic reading on reading comprehension and the reported use of reading strategies by university level ESL students. Because of imposed time limitations, SQ3R was selected as the treatment method. The SQ3R method was taught to one treatment group with explicit instruction in how and why the method can be used strategically, and to a second treatment group as a study skills unit with no reference to strategic reading. A control group was included that received no instruction in either SQ3R or strategic reading.

The research was conducted with a group of Malay students who are participating in the ITM/MUCIA cooperative program in Malaysia. This program, which is jointly administered by Indiana University and the Institut Teknologi MARA (ITM), provides Malay students with two years of lower division undergraduate study which is transferable to American universities. This chapter details the data collection and analysis procedures for this dissertation. The first section describes the subjects who participated in the study. The next section details the instructional procedures for the treatment groups. Section three provides a description of the data collection, while the final section describes procedures used to analyze the data.

Subjects

A sample of thirty subjects was drawn randomly from a group of 283 students studying in the Track 2 ESL reading classes taught at the Shah Alam campus of the ITM/MUCIA program. At the time of data collection, the students had completed a summer session and one semester of ESL in the ITM/MUCIA program.

All subjects were ethnic Malays between 17 and 19 years of age who spoke Bahasa Malaysia as their first language. The subjects come from a wide range of geographical locales in Malaysia, both urban and rural.

The first treatment group of fifteen students, called the "strategic" group in this dissertation, was taught SQ3R with a focus on the conscious use of the six steps in SQ3R as reading strategies. The subjects were instructed to think about and evaluate the success of their reading.

The second treatment group of fifteen students, referred to in this dissertation as the "procedural" group, was taught SQ3R as a study skills unit. Instruction was given in a sequential, procedural manner with no reference to strategic reading.

A control group of fifteen subjects, who received training in neither SQ3R nor reading strategies, was selected randomly from the pool of remaining students.

The strategic group was made up of eight men and seven women, the procedural group consisted of nine males and six females, and the control group had ten males and five women.

Permission was secured from the ITM/MUCIA administration and the MSU Human Subjects Committee to conduct the study.

Instructional Procedures

Classes

The data were collected during an eight week period in the second semester. Both the strategic and procedural groups consisted of fifteen students randomly assigned to ESL reading classes that I taught as the regular classroom instructor. Both groups completed the required reading selections from semester curriculum in addition to supplementary instruction in SQ3R. The strategic group was taught how and why they should use SQ3R as a multicomponent reading strategy in order to enhance their awareness and use of strategies. The procedural group was taught SQ3R as a study skills unit with no instruction on using the method strategically. A log on both classes was kept to document that both groups have received an equal amount of instructional time in SQ3R.

A control group, which received training in neither SQ3R nor strategic reading, was drawn from the Track 2 pool. All subjects were given the same reading materials, and took the same unit quizzes and final examination established in the reading syllabus.

Strategic Group Instruction

At the beginning of the treatment period, the strategic class was taught SQ3R using a unit from a reading skills

textbook, Reading and Study Skills (Langan, 1982).

The SQ3R method was introduced sequentially during a five day period with each day devoted to a step and practice with previously introduced steps. The first day of instruction started with an overview of SQ3R that acquainted the students with each step and its purpose, then the specifics of surveying were introduced. The survey step in SQ3R follows this sequence:

1. Look at the title, author, and date of publication
2. Read the first paragraph
3. Read the first sentence of the subsequent paragraphs
4. Read headings and subheadings
5. Look at pictures, graphs, charts, and tables
6. Look for boldface or italicized items
7. Read the last paragraph.

On the second day, after a brief review and practice with surveying, the students were introduced to questioning:

1. Use headings and subheadings to form questions.
2. Form questions from boldface and italicized items.

The reading step was introduced the next day, after a review and practice with surveying and questioning. For this step, the student were told to:

1. Find answers to the questions devised in the previous step.
2. Use the headings and subheadings as a guide.

Reciting and reviewing were introduced at the beginning of the next class. Students were informed that immediately

after reading a text, they should:

1. Put the text aside and try to recall information.

2. Write a brief summary of what they recalled.

Finally, they were told to review the material by using their summaries as a guide, correcting misinformation, and adding important points they had missed.

The final day of the instructional week was devoted to a brief review of the entire sequence and a practice session.

On Monday of the next week, the students were given instruction in using SQ3R as a multicomponent strategy. First, the students were introduced to an explanation of strategic reading and how the six steps in SQ3R could be used as strategies.

For example, they were taught that the survey step is not limited to looking over headings, boldface words, and diagrams. They were taught that during the this step, they (1) established their purpose for reading, (2) wrote brief notes on what they knew about the topic, (3) estimated the difficulty of the text, (4) reserved an appropriate amount of time to read and study it, (5) predicted in writing what they would find in the content, (6) anticipated the likely problems, and (7) set up strategies to meet these problems.

Since the emphasis in the strategic group was to develop self-regulated use of reading strategies, the students were encouraged to consider the purpose of each part of the survey sequence. For example, the following sample is based on the log that was kept during the treatment period:

T: The first step is called "survey". Quickly skim through the selection, look at the title and any heading, look at boldface words and italics, pictures, and charts. Quickly read the first sentence of each paragraph.

Why should you read the title and headings?

S: Find out what the article is about.

T: Ok, you get general idea of what you will read. Why look at boldface words and italics?

S: They are important.

T: They are important. It's the author's way of telling you that you should remember something. Would you expect to find these things on a test?

S: Yes.

T: Sure, but do you know why would you want to look for them before you started reading?

(Silence)

T: You read a title and the subheadings to get a general idea of what the article is about. You look at the boldface words and italics to give an idea of what will be important to learn. This will also give you an idea of how difficult the article will be. This way, you can plan out how much time you will need to study the information

Let's repeat some reasons for surveying. First, you want to know what the article is about. Next, you want an idea of what will be important to understand and to learn. Third, you want to get a idea of how difficult it will be so you can plan on how you will read and study it.

Similarly, the objective with questioning was not only to provide the students with a procedure, but direct their attention to the purpose and usefulness of the procedure:

T: The title and each of the subheadings can be turned into questions. For instance, the title of this chapter is "Some Matter and Energy Laws". How can this be made into a question?

S: What are some matter and energy laws?

T: Sure, that is the obvious question. What other questions can you ask?

T: How about "What IS a matter law?" Anyone know?

(Silence)

T: Before you can really know what some of the matter laws are, you should what a matter law is, right? This is a question you should be asking yourself before you start to read. How about another question?

S: What is an energy law?

T: That makes sense, doesn't it? In fact, you should ask "What is energy?" and "What is matter?" You think you know what matter is, but will the article agree with you?

So, from the title, how many questions have you got?

S: Five.

T: Ok. Before you have begun to read the article, you already know five things you need to find out. Write them down.

The students were also given the following guide to help them in formulating their own questions to be answered while reading.

1. Select the best type of question to match information present in the reading selection: what, how, why, where, who, and when.
2. Look at questions at the end of the text. Check to see if the questions are in the same sequence as the information in the reading selection.
3. Which questions, if any, can you answer before you begin to read. Write down you answers.

The students were taught that, while reading, they should apply and modify the strategies they had previously set up,

look for answers to their questions and verify any answers they had written down in advance, devise new questions as necessary, relate the information in the reading selection to what they already knew, and monitor the extent to which they understood the material, noting both what they understood and did not understand.

The students were also instructed to mark sections that they believed would be covered in a test and to indicate why they thought this. They were told only items which were important and which they thought would be difficult to remember should be underlined or highlighted.

Reciting was presented as a means of comprehension monitoring. After completing a written summary, the students were told to evaluate and to reflect on how much they understood and recalled. They were advised to draft follow-up questions that would be answered during the review

Finally, the students were taught that a review does not mean simply rereading an entire chapter, but to verify the information they had written down during the previous four steps, evaluate their comprehension, and determine where their understanding had broken down. A key element in this step was for them to write down questions of what they had not understood, which could be used in discussions with other class members or brought up to the course instructor either in class or in a private conference.

The students in the strategic group were required to use SQ3R with each subsequent reading assignment. As part of

the class routine, the students met in small teams of three to discuss what each had done and why, and to compare notes, outlines, or summaries. In addition, they wrote test items that were distributed to other groups. A team leader would report a synopsis of discussion to the whole class.

Procedural Group Instruction

The procedural group was taught SQ3R from Reading and Study Skills (Langan, 1982) as a study skills method during the same week as the strategic group, but were not provided with the subsequent instruction in using SQ3R strategically.

Subjects in this group were taught SQ3R as a self-contained study skills unit and were not taught to be reflective about their reading. For example, when they were introduced to surveying, they were told the sequence without elaboration:

> T: The first step is called "survey". This means you look over the article quickly to get an idea what it's about.
>
> So, the first thing is to look at the title, the author's name, and the publication date.
>
> Next, look through the article and read the headings, look for boldface words and italics, and glance at any pictures or figures.

The instruction was heavily dependent on the SQ3R chapter from Reading and Study Skills (See Appendix D), and the subjects were provided with no information about the use of SQ3R that was not included in the chapter.

For the remainder of the term, the students were required

to apply SQ3R to all in-class assignments. They were not required to work in teams, but were permitted to do upon request.

Data Collection

Two types of data were gathered: a measure of comprehension and a measure of reported use of strategies.

Procedures for Collecting the Comprehension Measure

Data on comprehension were collected through student retellings of reading selections. A pretest was given before treatment to validate the equality in reading comprehension among the groups. The subjects read a section of Chapter 1, "The Origin of the Earth, Its Oceans, and Life in the Oceans" (See Appendix E) from Essentials of Oceanography (Thurman, 1983), drafted an outline of the chapter, and wrote a retelling of the chapter.

A section of Chapter 4, "The Origin of the Ocean Basins: Theory of Plate Tectonics" (See Appendix F) from the same textbook was used for the posttest to measure and compare posttreatment comprehension among groups.

These chapters were selected because both are early chapters of an introductory textbook that has been specifically written for the community college level and do not require extensive prerequisite knowledge of the topics. Moreover, the chapters are concise, with headings, subheadings, definitions of technical terms, and diagrams

included as reading guides.

Before gathering data, a colleague, who is presently teaching study skills in the ITM/MUCIA program, and I independently read the reading selections, drafted outlines, and wrote out retellings. We compared the results and reached an agreement on the main ideas, supporting details, and organization of both selections. We developed scoring instruments in which the main ideas were assigned two points each and supporting ideas were given one point each.

Scoring forms incorporating these main and supporting ideas with the points for each was developed for both the pretest (Appendix G) and the posttest (Appendix H).

Retelling was selected over discrete item testing because the subjects would be obliged to produce evidence of comprehension rather than recognize possibilities. Retelling is a widely used measure of both awareness and recall (Richgels, McGee, Lomax, and Sheard, 1987), while outlining permits the students to organize recalled information before attempting to write out a retelling.

In the research in ESL students' recall of expository text, Carrell (1984, 1987), Connor and McCagg (1983), and Connor (1984) used retelling as the preferred method of gathering information on ESL students' reading comprehension on the assumption that students recall and write down what they consider to be the most important aspects of a passage.

Pearson, Dole, Duffy, and Roehler (in press) observe that although discriminating between more important and less

important concepts or facts, such as distinguishing main ideas from supporting details, is useful, being able to integrate these ideas into coherent summaries or retellings is considerably more useful as a means retaining and expressing information. In a retelling, the students synthesize what they have read by deleting irrelevant and redundant information, creating superordinate labels for a list of things or activities, locating the topic sentences that are essential, and creating topic sentences that are not accessible from the text.

Establishment of Pretreatment Reading Comprehension Equality Among Groups

To confirm that the three groups were of equitable reading proficiency, a pretest was administered before treatment. This pretreatment test was given to the strategic and procedural groups as part of the two hour reading and writing block. The control group met in classroom on the same day for the specific purpose of taking the test.

The subjects were given a packet consisting of:

1. The reading sample: A selection from Chapter 1, "The Origin of the Earth, Its Oceans, and Life in the Oceans" from Essentials of Oceanography.
2. Instructions.
3. Three sheets of paper for writing the responses.

The first two sheets were blank except for the headings designations of "Outline" and "Retelling", plus a space for their ITM identification number. The subjects were told not

to write their names on any of the papers. The third sheet was for writing out the reports of strategies.

The subjects were given the following instructions which were also read orally to them before the test:

1. Study the attached article carefully. Pretend you have to read this article for a course and that you will have a test on it. You may mark on the article as much as you like.

2. After you have finished studying the article, raise your hand so that I can collect it. Then, on Sheet #1 draft an outline of what you remember from the article.

3. On Sheet #2, using the outline, write a brief retelling of what you recall from the article. Do not worry about grammar or spelling since these will not be considered when I evaluate the papers.

The subjects were then given verbal instructions to read and study the article for as long as necessary and were advised to use any reading techniques they wished. When they confident that they understood the selection, they were instructed to set aside the reading and draft an outline on the first sheet of blank paper. The purpose of the outlines was to give the students the opportunity to write down and organize the information before writing a retelling. When they had completed drafting the outline, they were told to write a brief retelling of the selection on the second response sheet using the outline as a guide.

Collection of Posttreatment Comprehension Data

The above procedure was repeated after the eight-week treatment period using a different reading sample, a selection from Chapter 4, "The Origin of the Ocean Basins:

Theory of Plate Tectonics". All procedures were identical to the pretest.

Procedure for Collecting Reports of Strategy Use

Reports of strategy use were collected by having the subjects write a description of their reading behaviors immediately after they had completed writing the retellings of the selection.

The subjects were provided with the following written instructions which were also orally read to them before they began the test:

> On the third sheet of paper, tell me what you did and what you were thinking while you were reading the article. Write down everything you can remember doing while you read the article and when you wrote the retelling. Try to think of everything you did, but only tell me what you did -- I am not looking for any particular "correct" answers.

In addition, the subjects were provided with following back-up instructions on the response sheet:

> You have just read part of a chapter of a textbook and have written out an outline and a retelling. Take a few minutes to think about HOW you read this selection.
>
> For example:
>
> * What did you do, if anything, before you began to read it?
>
> * What did you do while you were reading?
>
> * If you did not understand something, what did you do?
>
> * Did you do anything after you finished reading the article?
>
> Please write out a description of how you read this article. Tell me anything you remember of what you did

while reading. Do not worry about grammar, spelling, or neatness -- just write out what you did while you were reading the article.

Upon completing the report, the subjects handed in all papers and were permitted to leave the testing room.

Written reports were selected over verbal interviews to preserve anonymity during the gathering of data, to relieve student anxiety that might interfere with reporting if the students were being interviewed by an authority figure, and to accumulate quickly metacognitive data on all subjects rather than with a small sample.

An instrument to rate the subjects' reports consisted of the following categories:

1. Recall of general knowledge before reading
2. Surveying
3. Formulating Questions
4. Using text organization
5. Using general knowledge while reading
6. Using repair strategies
7. Taking notes
8. Underlining or Highlighting
9. Reviewing
10. Comprehension monitoring

A separate category was labelled "other strategies" to include reported strategies not covered by the other ten.

Using this instrument, my colleague and I read each of the reports and tallied the instances of reported strategy use, then compared the tallies.

Procedure for Maintaining Subject Anonymity

To protect objectivity, the subjects' ITM identification numbers were used during the data collection in lieu of names. These student numbers are assigned by ITM for their records, and are not used by Indiana University. The ITM student numbers of all subjects were kept sequentially in a computer database file so that there was no indication of which group any subject was in while the data was being collected and scored. The student numbers were resorted by group for analysis after the data had been collected and scored.

Data Analysis

To establish interrater reliability, a pilot sample was collected from a group of fifteen students from Track 1 who took the comprehension tests and wrote out strategy reports. Using an instrument developed before data was gathered, the samples were scored by a colleague and myself during a practice session. Interrater reliability was .93 for the retellings and .98 for the reports of strategy use.

Analysis of the Comprehension Measures

All retellings from both the pretest and posttest were scored by my colleague and myself.

Following the procedure described by Connor (1984), the retellings scored on the basis of the number of superordinate propositions (main ideas) and subordinate propositions

(supporting details) included in the retelling.

Analysis of the Pretest Comprehension Measures

The purpose of the pretest was to establish that there were no significant differences among the groups before treatment. Each of the pretest retellings were read independently by my colleague and myself and scored with the measure developed and refined before data had been gathered (See Appendix G).

A value for each recalled proposition was assigned depending on its category as either a main idea (superordinate proposition) or a supporting idea (subordinate proposition). Main ideas were assigned two points each, while supporting ideas were given one point each. For the pretest measure, a total of twelve points were possible for main ideas and eighteen points for supporting ideas for a potential total of thirty points. The raw scores were then converted to percentages.

The mean, standard deviation, and range were derived through the ABSTAT Statistical Program, an IBM compatible software package produced by Anderson-Bell (1982). The results were analyzed with the Mann-Whitney U Test, a nonparametric statistical procedure, to determine if there were significant differences in comprehension among the three groups. The .05 level of significance was selected.

A nonparametric statistical test was chosen over parametric testing because of the small samples and the type

of measures used to derive the scores.

Rather than analyzing the variance of means, the Mann-Whitney U Test determines if the distribution of scores of independent samples differ significantly from each other. The null hypothesis is that there is no significant difference among a distribution of scores between groups. If the U is significant, than a larger grouping of scores in one sample will higher or lower than that of the other sample (Borg and Gall, 1983).

Analysis of the Posttest Comprehension Measure.

The procedures described above for the pretest validation were followed with the posttest. The retellings were scored with the measure developed earlier with a pilot sample (See Appendix H).

As with the pretest, a value for each recalled proposition was assigned depending on its category as either a main idea or supporting idea. Main ideas were assigned two points each while supporting ideas were given one point each. For the posttest measure, a total of twenty points were possible for the main ideas and sixteen points for supporting ideas for a potential total of thirty-six points. The raw scores were converted to percentages.

To answer the comprehension research questions, each of the scores were compared with the Mann-Whitney U Test to detect significant differences between groups. The .05 level of significance was selected.

Analysis of the Reports of Strategy Use

The reports of strategy use were analyzed to provide answers for questions four, five, and six, the effects that teaching SQ3R has on ESL students' reports of their use of strategies in their own reading.

Upon completion of the both the pre-test and post-test retellings, the subjects were instructed to write a brief description of how they studied the reading selections. These reports were scored with the instrument listing the following strategies:

Strategy	Indicator
Recall of General Knowledge	Subject reports reflecting on previously known information about the topic before reading.
Surveying	Subject reports previewing the selection before reading and identifies previewing activities such as reading headings, looking at graphs, etc.
Formulating Questions	Subject reports generating questions to be answered while reading.
Using Text Organization	Subject reports using the organization devices included in the text to help ease reading, such as signal words, transitions, etc.
Using General Knowledge	Subject reports referring to knowledge and experience to explain, clarify, question, or extend information while reading.
Using Repair Strategies	Subject reports using a repair strategy, such as looking back, to resolve a reading problem.

Taking Notes	Subject reports making notes while reading
Underlining or Highlighting	Subject reports marking important items in the text by underlining or by highlighting with marker.
Reviewing	Subject reports systematically reviewing notes, underlined or highlighted items, recalling information, etc.
Comprehension Monitoring	Subject reports assessing reading comprehension throughout the task.

In addition to these specific strategies, space was provided to record reported strategies not listed in the instrument.

The reports were independently reviewed and the reports of strategy use were tallied by myself and my colleague. The tallies were scored on a two point scale:

0 = No reference to the specific strategy

1 = Specific strategy and its use is reported

The results of the posttest strategic reports were compared to determine if differences in the reported use of strategies were indicated by the three groups.

Summary

Forty-five subjects were divided into two treatment groups and one control group of fifteen participants each. The two treatment classes were taught by myself as the classroom instructor while the control was drawn randomly from the pool of remaining students.

One treatment group, the "strategic group" was taught SQ3R, but with additional instruction in actively using each of the SQ3R steps as reading strategies. The "procedural group", was taught SQ3R as a study skills unit with no reference to using the method strategically. The control received training in neither SQ3R nor strategic reading.

Data for comprehension testing was collected by having the subjects read a brief selection and write a retelling of what they recalled. Data on strategy use was collected by having the subjects write out a description of their reading activities during the collection of the comprehension data.

The comprehension data was analyzed with the Mann-Whitney U Test while the reports of strategy use were evaluated through a tally of the students' reports.

CHAPTER FOUR

RESULTS OF DATA ANALYSIS

The purpose of this study was to examine the effects of teaching strategic reading on university ESL students' reading comprehension and reports of strategy use after reading. To answer the research questions, one treatment group received instruction in the SQ3R method as a multicomponent strategy, while the other was taught SQ3R as a study skills unit. Data were collected on reading comprehension and reported use of reading strategies. The sources of data were written retellings of a textbook selection and written self-reports of a strategy use.

This chapter reports the results of the comprehension measures and the strategic reports.

Results of the Pretreatment Measures in Comprehension and Reports of Strategy Use

The purpose of the pretreatment measures was to establish that there were no significant differences in comprehension ability among the groups before treatment and to establish the number and type of strategies reported by the subjects.

Results of the Pretreatment Comprehension Test

The results of the pretreatment comprehension test are reported in Table 4.1. The percentages were used for data analyses.

Table 4.1

Results of the Pretreatment Comprehension Test

Raw Scores and Percentages

1 = Strategic Group 3 = Control Group
2 = Procedural Group

1		2		3	
RS	%	RS	%	RS	%
14	47	16	53	15	50
13	43	13	43	12	40
12	40	13	43	11	37
12	40	12	40	10	33
11	37	11	37	9	30
10	33	10	33	8	27
8	27	10	33	8	27
8	27	8	27	8	27
7	23	8	27	7	23
6	20	8	27	7	23
6	20	8	27	6	20
6	20	8	27	6	20
5	17	7	23	6	20
5	17	5	17	6	20
3	10	4	13	4	13

Group	n	Mean	SD	Range
Strategic	15	28	11.228	37
Procedural	15	31	10.554	40
Control	15	27	9.507	37

A comparison of the results by the Mann-Whitney U Test is reported in Table 4.2. The U obtained for the strategic group versus the control group was 112; for the procedural group versus the control group, U was 83; and for the strategic group versus the procedural group, U was 92. Since a U of 72 or less would have been significant for each comparison, no significant differences among the groups' reading comprehension was indicated before treatment.

Results of the Pretreatment Reports of Strategy Use

A summary of the reported strategy use by each group before treatment is presented in Table 4.3.

A review of the written reports of strategy use reveal that no group reported using significantly more strategies than the other two groups. The results do show frequent reports of surveying, underlining/highlighting, and use of repair strategies across all three groups. Comprehension monitoring was totally unreported, while reports of the remaining six strategies were limited.

Results of the Posttreatment Comprehension Measure

The three research questions directed specifically to comprehension were:

1. What are the differences in the reading comprehension performance of ESL students who receive instruction in SQ3R with a focus on developing their use of reading strategies and a control group that does not receive this instruction?

2. What are the differences in the reading comprehension performance of ESL students who receive instruction

Table 4.2

Results of the Mann-Whitney U Test Comparing Group Performance on Pretreatment Comprehension Test

Between Variable	Sample Size	U
Strategic Group	15	112
Control Group	15	113
Procedural Group	15	83
Control Group	15	142
Procedural Group	15	92
Strategic Group	15	133

Table 4.3

Summary of Reported Strategy Use by Each Group Before Treatment

Groups

1 = Strategic Group (n = 15)

2 = Procedural Group (n = 15)

3 = Control Group (n = 15)

Strategy Categories	Groups: 1	2	3
1. Underlining/Highlighting	13	13	14
2. Surveying	13	11	10
3. Using Repair Strategies	9	8	8
4. Reviewing	4	2	4
5. Taking Notes	3	2	2
6. Using General Knowledge	1	2	2
7. Using Text Organization	1	1	1
8. Recall of General Knowledge	0	3	1
9. Formulating Questions	0	1	0
10. Comprehension Monitoring	0	0	0
Total:	44	41	42

in SQ3R in a procedural method and a control group that does not receive this instruction?

3. What are the differences in the reading comprehension performance of ESL students who receive instruction in SQ3R with a focus on developing their use of reading strategies and those who receive instruction in SQ3R in a procedural method?

The results of the posttreatment measure are reported in Table 4.4.

A comparison of the comprehension scores between the strategic and control groups shows the strategic group's comprehension performance with the selection was significantly higher than the control group's. The strategic group's scores ranged from a high of 58% to a low of 17% while the control group's scores ranged from 39% to 6%. Moreover, the strategic group's mean of 32% was twelve points higher than the control group's. An analysis of the scores with the Mann-Whitney U Test indicated that the differences were statistically significant at the .05 level (See Table 4.5).

These results suggest that in answer to Question 1, which addresses differences in the comprehension performance of ESL students who receive instruction in SQ3R with a focus on developing their use of reading strategies compared to a control group that does not receive such instruction, students who have been taught SQ3R as a multicomponent strategy show a higher level of comprehension than students who have been instructed in neither SQ3R nor strategic reading.

Table 4.4

Results of the Posttreatment Comprehension Test

Raw Scores

1 = Strategic Group 3 = Control Group
2 = Procedural Group

1		2		3	
RS	%	RS	%	RS	%
21	58	17	47	14	39
21	58	16	44	12	33
20	56	15	42	11	31
15	42	13	36	9	25
15	42	12	33	9	25
11	31	10	28	8	22
10	28	10	28	7	19
10	28	9	25	7	19
8	22	9	25	6	17
8	22	8	22	6	17
8	22	7	19	4	11
7	19	6	17	4	11
7	19	5	14	4	11
6	17	5	14	2	6
6	17	2	6	2	6

Group	n	Mean	STD	Range
Strategic	15	32	15.234	41
Procedural	15	27	11.974	41
Control	15	20	9.841	33

Table 4.5

Results of the Mann-Whitney U Test Comparing Group Performance on the Posttreatment Comprehension Test

Between Variable	Sample Size	U
Strategic Group	15	58*
Control Group	15	167
Procedural Group	15	72*
Control Group	15	152
Strategic Group	15	94
Procedural Group	15	130

*p < .05

A comparison of the comprehension scores between the procedural and control groups shows the procedural group's comprehension performance with the selection was significantly higher than the control group's. The procedural group's comprehension scores ranged from 47% to 6% as compared to the control group's range of 39% to 6%. In addition, the procedural group's mean of 27% was seven points higher than the control group's mean of 20%. The difference in performance was found to be significant when analyzed with the Mann-Whitney U Test (See Table 4.5).

This indicates that the answer for Question 2, which is concerned with differences in the comprehension performance of ESL students who receive instruction in SQ3R as a study skills procedure and a group that has not been instructed in SQ3R, is that students who have been taught SQ3R show a higher level of comprehension than students who have not been taught SQ3R.

A comparison of the comprehension scores between the strategic and procedural groups shows the strategic group's comprehension of the selection was somewhat higher than the procedural group's. However, the statistical analysis of these scores with the Mann-Whitney U Test did not show that the differences were statistically significant.

These results, in response to Question 3 which addressed the differences in the comprehension of ESL students who receive instruction in SQ3R with a focus on developing the use of reading strategies with students who are taught SQ3R

as a study skills procedure, suggest that students who have been taught SQ3R as a multicomponent strategy do not show a significantly higher level of comprehension after treatment than students who have been instructed in SQ3R as a procedural method.

Summary of Comprehension Results

The research questions asked if significant differences in reading comprehension would result after providing ESL students with instruction in SQ3R as a multicomponent strategy and as a procedural study skills method.

The results of the posttreatment comprehension measure showed that both treatment groups scored significantly higher in comprehension than the control group. No significant differences were indicated between the performance of the two treatment groups.

These results indicate that teaching ESL students to use SQ3R either strategically or as a procedural method has a positive effect on their reading performance. While the results suggest that teaching SQ3R as a multicomponent reading strategy results in a higher level of comprehension than limiting instruction to using SQ3R as a study skills unit, the differences were not statistically significant.

Analysis of the Reports of Strategy Use

The three research questions directed to the reported use of reading strategies were:

4. What strategies do ESL students report using after they have received instruction in SQ3R with a focus on developing their use of reading strategies?

5. What strategies do ESL students report using after they have received instruction in SQ3R in a procedural method?

6. What strategies do ESL students report using if they have not received instruction in SQ3R either with a focus on developing their use of reading strategies or procedurally?

The focus of these questions was to determine if teaching SQ3R, both as a multicomponent strategy and as a study skills procedure, would have positive effects on ESL students' reports of strategy use.

The subjects wrote reports of their reading behaviors as part of the pretreatment measure, which was then analyzed to assess the extent to which they reported strategy use before exposure to SQ3R (See Table 4.3). After the treatment period, the subjects again wrote reports describing their reading behaviors as part of the posttreatment measure. A summary of the posttreatment reports of strategy use by each of the three groups is presented in Table 4.6.

As with the pretreatment measure, the three strategies most frequently reported by all three groups, with little change in the number of reports, were surveying, underlining/highlighting, and using repair strategies. Thus, the effects of teaching SQ3R as either a multicomponent strategy or a study skills procedure on reports of these three strategies cannot be reliably assessed and will be excluded in the general discussion of the results.

Question 4 was concerned with the strategies that the

Table 4.6

Summary of Reported Strategy Use by Each Group After Treatment

Groups

1 = Strategic Group (n = 15)
2 = Procedural Group (n = 15)
3 = Control Group (n = 15)

Strategy Categories	1	2	3
1. Underlining/Highlighting	13	12	10
2. Surveying	13	13	14
3. Using Repair Strategies	11	7	4
4. Reviewing	10	9	7
5. Comprehension Monitoring	10	5	0
6. Taking Notes	4	6	6
7. Recall of General Knowledge	4	4	1
8. Formulating Questions	4	4	0
9. Using General Knowledge	2	1	0
10. Using Text Organization	2	1	0
Total	73	62	42

strategic group would report using after they had received instruction and practice in SQ3R as a multicomponent strategy. The most notable gains in the number of strategies reported by the strategic group were in comprehension monitoring and reviewing after reading, while gains in the reported use of the remaining strategies were limited. Overall, the total number of strategies reported by this group increased by twenty-seven from nine reported strategies to thirty-six

A comparison of the remaining reports of strategies by the three groups before and after treatment is presented in Table 4.7.

Question 5 was concerned with the strategies that the subjects in the procedural group would report using after they had received instruction and practice in SQ3R as a study skills unit. The greatest increase in the number of strategies reported by the procedural group was with reviewing after reading and comprehension monitoring, while gains in the reported use of the remaining five strategies were limited. Overall, the total number of strategies reported by this group increased by twenty from eleven reported pretreatment strategies to thirty-one strategies after treatment.

Question 6 was concerned with the strategies that the subjects in the control group, who received neither instruction nor practice in either SQ3R or strategic reading, would report. This group showed a moderate increase in

Table 4.7

Summary of Reported Strategy Use by Each Group Before and After Treatment

Strategic Group

	Before	After
Comprehension Monitoring	0	10
Reviewing	4	10
Recall of General Knowledge	0	4
Formulating Questions	0	4
Taking Notes	3	4
Using General Knowledge	1	2
Using Text Organization	1	2
Total	9	36

Procedural Group

	Before	After
Reviewing	2	9
Taking Notes	2	6
Comprehension Monitoring	0	5
Recall of General Knowledge	3	4
Formulating Questions	1	4
Using Text Organization	1	2
Using General Knowledge	2	1
Total	11	31

Control Group

	Before	After
Reviewing	4	7
Taking Notes	2	6
Using General Knowledge	2	0
Using Text Organization	1	0
Recall of General Knowledge	1	1
Formulating Questions	0	0
Comprehension Monitoring	0	0
Total	10	14

the number of students reporting the use of reviewing and notetaking; however, with three strategies, the number of reports declined after eight weeks. Overall, the total number of strategies reported by this group showed a net increase of four, from ten to fourteen reports, at the end of the treatment period.

Summary of Reports of Strategy Use

The research questions were concerned with the strategies that each group would report after the treatment period. The results show that most commonly reported strategies by all three groups before and after treatment were surveying, underlining/highlighting, and using repair strategies.

With the remaining strategies, both the strategic and procedural groups showed an increase in the reported use of comprehension monitoring and reviewing, and both groups showed significant gain in the number of reported strategies.

The control group showed little change in the number of reported strategies after the treatment period.

Summary of Chapter Four

The results of the comprehension measure indicate that the strategic group showed the highest level of reading comprehension on the posttreatment selection, followed by the procedural and control groups. The comparison of scores indicated that both the strategic and procedural groups' scores were significantly different from the control groups'.

The difference between the strategic and procedural groups' scores were not found to be statistically significant.

The results of the reports of strategy use indicate that the strategic and procedural groups reported a significant increase in the number of strategies after the treatment period, while the control group showed minimal gains in reports of strategy use.

CHAPTER FIVE

CONCLUSIONS

Introduction

The purpose of this study was to examine the effects of teaching the SQ3R method as a multicomponent strategy on university level ESL students' reading comprehension and on their awareness of reading strategies. The general research question addressed in this study was:

> What are the differences in comprehension performance between ESL university students who receive instruction in SQ3R both as a study skills unit and with a focus on developing reading strategies, and those who do not receive such instruction, and what are the differences in the strategies they report after instruction?

The dilemma facing university level ESL reading programs guided the formulation of this general question. Within an academic year or less, an ESL program must help students overcome severe weaknesses not only in their language proficiency, but frequently in their study habits and attitudes toward learning, so that they will be able to comprehend academic texts with sufficient competence and independence to meet the requirements of university level courses in English.

Given the limited period of time allocated to prepare their students for academic classes, ESL programs usually cope by providing instruction that is concise, structured, and intensive, and with an emphasis on syntactic features. Specifically, an ESL reading curriculum focuses on teaching

reading as a decoding process in which the objective is to replicate information. The theoretical basis for this approach is that language development is a linear, hierarchical process in which reading is subordinate to the spoken language. Bluntly stated, reading is "parasitic on language" (Mattingly, 1972). Thus, providing students with extensive training in vocabulary and teaching them how to apply the rules of language systematically to a text in order to decode meaning has been viewed as the most efficient means to improve reading (Carrell, 1988). As noted in Chapter Two, ESL reading instruction frequently consists of extensive practice with grammar, word forms, and vocabulary under the assumption that language proficiency naturally follows (Carrell, 1987; Dinsmore, 1985).

Knowledge of the vocabulary and grammar of English is certainly essential for reading English texts, and appropriate instruction in these areas should not be neglected. The key word is appropriate; international students who plan to work toward undergraduate or graduate degrees in the United States should be competent in English before they are admitted to American universities. To expect an ESL program to develop a beginning English language learner into a successful American university student within two or three academic terms is unrealistic. Nevertheless, ESL programs frequently are organized as though the students were complete novices in the language.

A survey of the research in reading shows that for

native English speakers effective reading is a constructive process that requires awareness of the strategic options and the appropriate application these options to the reading task. Although one may intuitively assume that this is also true for non-native speakers, research has not been conducted to provide support this conclusion. Carrell (1984; 1985) and Connor (1984) have shown that schemata and knowledge of both text organization and text structure are important when considering the reading proficiency of university level ESL students, but these studies have not examined the effects of teaching strategic reading on either second language reading performance or on the development of ESL students' use of reading strategies.

Recognizing that knowledge of vocabulary and language structure is necessary in reading, limiting ESL reading instruction to these two domains restricts learning to a single dimension and deprives students of essential options for improving their reading comprehension. Expertise in English syntax and an exceptional knowledge of English vocabulary will not by themselves produce successful readers. Clarke (1980) has suggested that the reverse is true: ESL students who become overly reliant on their knowledge of grammar and vocabulary often ignore their own good reading skills while attempting to decode complex English texts.

The research in reading has established that explicit instruction in strategic reading with a focus on developing metacognitive awareness can transform a native English

speaking students into an active, self-regulated reader. Research is now needed to determine if similar effects occur after teaching strategic reading in ESL settings.

Summary of the Design and Procedures

This dissertation addressed the effects of teaching SQ3R on the reading comprehension and reported use of reading strategies by ESL students. First, the study examined whether instruction in SQ3R as either a multicomponent strategy or as a study skills procedure affects ESL students' reading comprehension, and, second, if instruction in SQ3R affects ESL students' reports of their use of strategies.

The study was conducted with students enrolled in the ESL program of the ITM/MUCIA project in Malaysia. After a summer session and a maximum of two academic semesters in the ESL program, the students spend two years at the Malaysian campus completing lower division requirements before transferring to universities in the United States.

These students come from an educational system that values rote memorization of information at the expense of reflection, analysis, and evaluation. As a result, testing in this system is based entirely on recall of information that has been mandated by the Ministry of Education. Students thus enter the ITM/MUCIA program not only with deficiencies in the language, but with little or no background in approaching reading either strategically or with metacognition. To these students, reading comprehension

is the quantitative measure of details that can be memorized in a limited period of time.

While memorizing sections of textbooks may get these student through some tests, the process is time consuming, inefficient, and is unlikely to result in learning. Thus, the objective ESL instruction should be to introduce the students to the practice of being strategic in reading and to develop the students' use of reading strategies so that they will reflect on and evaluate their own reading.

Recognizing that an ESL program is allocated limited time to meet these objectives, one purpose of this dissertation was to examine the possibility that the SQ3R method could be used as a multicomponent strategy to improve both the students' reading comprehension and their use of reading strategies.

To compile data for this study, a random sample of forty-five students was selected from a group of 283 enrolled in the ESL program of the ITM/MUCIA program in Malaysia. The students were randomly assigned to two treatment groups and a control group. One group, called the strategic group, received instruction in SQ3R with additional instruction on how and why the method should be used, while a second group, called the procedural group, studied SQ3R only as a study skills unit. A control group received no instruction in SQ3R.

All subjects participated in a pretreatment assessment to confirm the equity of their reading proficiency and to

analyze their reported use of reading strategies. The strategic and procedural groups then received instruction and guided practice in their respective treatments for eight weeks. The strategic group was taught SQ3R as a multicomponent strategy and the procedural group was taught SQ3R as a study skills procedure and was not provided with information on using the method strategically.

At the conclusion of the term, all subjects were given a comprehension posttest and wrote out descriptions of their use of strategies. The comprehension tests were analyzed to determine if significant differences in comprehension were indicated among the three groups, while the descriptions of strategy use were compared to determine differences in the reported use of strategies. The pre- and posttreatment measures were not compared because of the non-equivalence of the pre- and posttests. Moreover, such comparisons were irrelevant to the research questions which addressed the differences among the groups after instruction in SQ3R.

This remainder of this chapter discusses the findings, implications, and future directions of research on explicit instruction of strategic reading and improving use of reading strategies of students in university ESL courses.

Discussion of the Findings

Summary of the Posttreatment Comprehension Scores

Comprehension measures were obtained by having the subjects read a textbook selection and write a retelling.

The selection was taken from a chapter of a college textbook. The retellings were scored by myself and a colleague using instruments that had been tested and refined with a pilot sample before data was collected. Results of the scoring were computed into percentages and analyzed with the Mann-Whitney U Test.

The strategic group showed the highest level of comprehension with a mean of 32, while the procedural group had a mean of 27 and the control group showed the poorest performance with a mean of 20. A comparison of all scores with the Mann-Whitney U Test yielded significant differences between the comprehension performance of the strategic group and the control group, and between the procedural group and control group. However, no significant difference in comprehension was found between the strategic group and the procedural group.

Discussion of the Comprehension Findings

At the outset, the general research question asked if teaching SQ3R either as a multicomponent strategy or as a study skills procedure would have an effect on university ESL students' reading comprehension. Based on research conducted with both reading strategies and SQ3R, it seemed reasonable that either approach would result in higher comprehension scores for ESL students, and, furthermore, that those who had been taught SQ3R as a reading strategy would show a higher level of comprehension than those taught SQ3R as a procedure.

The data produced mixed results. First, both treatment groups did score significantly higher on the posttreatment comprehension measure than the control group. In particular, the data shows that the strategic group exhibited a significantly higher level of comprehension on the posttreatment test than the control group. The strategic group's mean of 32 was a full twelve points higher than the control group's 20, and the control group's highest individual score of 39 was only slightly above the strategic group's mean. The procedural group, with a mean of 27, also scored significantly higher on the comprehension posttest than the control group. Thus, teaching SQ3R to ESL students appeared to have positive effects on their reading comprehension.

These results provide evidence that successful reading approaches for native speakers are applicable to reading in English as a second language; teaching ESL students to be strategic in reading English improves comprehension. This supports assertions by Long and Sato (1985) and Carrell (1987) that effective ESL instruction need not be limited to the form and accuracy of linguistic structures, but must include practice in the active process of reading.

Based on the research described in Chapter 2, it seemed likely that the strategic group would exhibit a higher degree of comprehension than the procedural group. Studies have shown that explicit instruction of the how and why of strategic reading is a prerequisite for effective reading

comprehension (Duffy, Roehler, Meloth, Vavrus, et al., 1986; Duffy, Roehler, Sivan, Rackliffe, et al. 1987; Paris, Wasik, and Van der Westhizen, 1988; Weinstein, 1987). While SQ3R as a study skills procedure does encourage students to be active and thoughtful about reading, the method does not provide for metacognitive guidance into how, when, and why each step should be used. Thus, it seemed reasonable that teaching SQ3R as a multicomponent reading strategy would have a greater effect on comprehension teaching it as a study skills procedure.

However, this assertion was not supported by the data. A comparison of the results indicates that teaching SQ3R either with explicit instruction on using the method strategically or as a self-contained study skills unit has about the same benefits on ESL reading comprehension. Although the descriptive analysis suggested that the strategic group showed a higher degree of comprehension than the procedural group, these differences were not found to be statistically significant.

The question arises as to why no significant differences were found between the comprehension performance of the two treatment groups. While the research reviewed in Chapter Two suggested that teaching SQ3R as a multicomponent strategy would lead to more effective comprehension than teaching the method in a procedural approach as a study skills unit, the results of this study indicate that short term instruction with either approach results in equally beneficial effects on

reading comprehension. In short, significant differences in comprehension effects between the two approaches cannot be quickly accomplished. Duffy and Roehler (1989) have observed that changing reading habits is a lengthy, and often discouraging, process, and that students seldom undergo complete transformations in response to initial instruction. Thus, an eight week treatment period was too brief to affect a significant difference between the two treatments. While both approaches resulted in beneficial effects, the instructional period was not sufficient for the students to fully understand and utilize the complexities of strategic reading.

Summary of the Comprehension Findings

The purpose of the study was to determine the effects of two approaches of teaching SQ3R on university ESL students reading comprehension.

Results of the analysis indicate that both treatment groups performed significantly better than the control group in reading comprehension. However, while the strategic groups' means were higher than the procedural groups', they do not provide support for concluding that teaching SQ3R as a multicomponent strategy was significantly more effective than teaching SQ3R as a study skills method. This lack of significant difference between the two approaches may be due to the short term instructional period.

Summary of the Reports of Reading Strategies

The objective of Research Questions 4 - 6 was to determine the effects of teaching SQ3R as a multicomponent strategy and as a study skills procedure on university level ESL students' reports of strategy use.

All subjects wrote reports on their reading behaviors as part of the pretreatment measure. These reports showed no group stating a more extensive use of strategies before treatment than the other two groups; the strategic group had a total of forty-four reports of strategies, while the procedural group had forty-one reports and the control group had forty-two reports. Furthermore, the number of reports for each strategy was consistent across the three groups. For example, underlining/highlighting was the most commonly reported strategy in all three groups, mentioned by a majority of subjects in all three groups, while comprehension monitoring was completely unreported.

Results of the posttreatment measure showed the strategic group reporting seventy-three total instances of strategy use, the procedural group reporting sixty-two instances, and the control reporting forty-two. Thus, the strategic and procedural groups both showed a substantial increase in the number of reported strategies, while the control group's total of reports of strategy use remained virtually unchanged (See Table 5.1).

Table 5.1

Comparison of Reported Strategy Use by Each Group Before and After Treatment

Groups

1 = Strategic Group (n = 15)
2 = Procedural Group (n = 15)
3 = Control Group (n = 15)

	Before			After		
	1	2	3	1	2	3
1. Surveying	13	11	10	13	13	14
2. Underlining/Highlighting	13	13	14	13	12	10
3. Using Repair Strategies	9	8	8	11	7	4
4. Reviewing	4	2	4	10	9	7
5. Taking Notes	3	2	2	4	6	6
6. Using General Knowledge	1	2	2	2	1	0
7. Using Text Organization	1	1	1	2	1	0
8. Recall of General Knowledge	0	3	1	4	4	1
9. Formulating Questions	0	1	0	4	4	0
10. Comprehension Monitoring	0	0	0	10	5	0
Total	44	41	42	73	62	42

Discussion of the Reports of Reading Strategies

The professional literature underlying the development of native English speaking literacy asserts that explicitly teaching students about strategies substantially improves their awareness and active use of strategies (Pearson, Dole, Duffy, and Roehler, 1989; Paris and Wixson, 1987; Wade and Holmes, 1989). Based on this, it seemed likely that teaching ESL students the SQ3R method as a multicomponent strategy would increase their reports of strategy use, while teaching SQ3R in a procedural approach would have a less positive effect on the reports.

The posttreatment data provided some encouraging support for this assertion. In reference to Research Question Four, overall the strategic group produced the greatest number of posttreatment reports of strategy use. Before comparing the pre- and posttreatment reports, the data were adjusted to exclude surveying, underlining, and using repair strategies since these had been reported by a majority of subjects in all three groups before treatment. Surveying had been introduced in the first semester ESL curriculum and was emphasized throughout both terms, while underlining and using repair strategies have usually been adopted by students during secondary education. Hence the students had awareness and experience with these strategies before treatment.

After adjusting for the three excluded strategies, the strategic group reported a posttreatment total of thirty-six instances of strategy use, an increase of twenty-seven

reports over the pretreatment measure. The most substantial increase was in the area of comprehension monitoring, assessing one's own comprehension while reading, which was unreported in the pretreatment measure, but reported by ten subjects in the strategic group after treatment. This appears to be a clear case of treatment effect since the reciting step of SQ3R was taught to the strategic group as a means of comprehension monitoring.

A second strategy that showed an increase of reported posttreatment usage by the strategic group was reviewing. This, too, appears to be a result of treatment, but possibly more directly from SQ3R than from explicit strategy instruction since the procedural group experienced a similar increase in reports of this strategy. The remaining strategies showed a moderate increase in reported use by the strategic group.

At first glance, the results seem to be somewhat disappointing since each strategy had been emphasized as part of the treatment. However, as mentioned previously in the discussion of the comprehension results, the eight week treatment period was probably too brief to bring about a substantial transformation in the students' independent awareness and use of strategies. Thus, while the data do not indicate that the subjects became independent, self-regulated readers after eight weeks of strategy instruction, the results do indicate increased awareness and use of strategies on the part of the strategic group.

Research question five was concerned with the strategies reported by the procedural group after receiving instruction in SQ3R as a study skills unit during an eight week treatment period. Again adjusting for the three excluded strategies, the data showed an overall increase of 19 reports of strategy use over the pretreatment measure. Thus, although teaching SQ3R as a study skills procedure does not explicitly introduce strategic reading, exposure to the method did have beneficial effects on the subjects' reporting of strategies.

The highest increase of procedural group reports between measures was reviewing, with a gain of seven reports. Taking notes and formulating questions before reading also showed a moderate increase in reports. Since these three activities are part of the SQ3R method, the increase in reports are likely the result of treatment.

Interestingly, comprehension monitoring, which is not explicitly addressed by SQ3R and was completely unreported by all three groups before treatment, was reported in the posttreatment measure by five subjects in the procedural group. The reciting step of SQ3R does implicitly direct the reader toward comprehension monitoring and procedural groups' reports of this strategy are encouraging.

In reference to research question six, which was concerned with the strategies reported by the control group, the most interesting observation is that while this group showed moderate gains in the reported use of three strategies, they reported fewer instances of using four other

strategies after eight weeks. An overall posttreatment total of forty-two strategies reported by the control group was virtually unchanged from the pretreatment totals where forty-one strategies were reported. After the adjustment for the three excluded strategies, the control groups' total of reported strategies is fourteen instances.

From the evidence provided by these results, giving ESL students instruction and practice in approaching reading as an active and constructive activity enhances their reported use of strategies. In particular, explicitly teaching these students to be strategic in their reading seem to have the greatest effect on their strategy reports, especially with comprehension monitoring. However, it is also evident that instruction over a longer time frame is necessary for ESL students to become totally self-regulating readers of English.

Summary of the Reports of Reading Strategies

The purpose of these research questions was to examine university ESL students reported use of reading strategies after eight weeks of instruction in SQ3R.

The results showed that the strategic group had the greatest number of reports in strategy use, followed by the procedural and control groups. Furthermore, when comparing the posttreatment reports with those written before treatment, both the strategic and procedural groups showed a sizeable increase in the number of reported strategies. The

most encouraging development was the increase of reports by the strategic and procedural groups of comprehension monitoring.

Overall, these results indicated that teaching ESL students' to SQ3R both as a multicomponent strategy and as study skills procedure has a beneficial effect on their reported use of reading strategies. However, a longer instructional period is necessary for ESL students to become independently strategic in reading English.

Implications of the Findings

Implications for Teaching Reading to ESL Students

International students are often admitted to American universities with language deficiencies which place them at a severe disadvantage and, without supplementary instruction in English, these students can expect to experience difficulties in academic courses that emphasize learning from text materials. The responsibility for providing this instruction is usually delegated to English as a Second Language programs. While enhancement of ESL students' competence with English syntax and vocabulary may be necessary, teaching these students strategies to help them successfully and independently read academic textbooks should also be integrated into the ESL reading curriculum.

However, the ESL approach to reading instruction seems to have hardened into a linguistic dogma: language proficiency is a prerequisite to strategy instruction.

Hudson (1982), for instance, contended that teaching ESL students to use strategies before they have developed linguistic competence impedes their reading comprehension.

This dissertation does not completely dispute this view. Proficiency with the English language is necessary for successful reading in English. Yet, the professional ESL literature fails to provide guidance as to what constitutes language proficiency or competence. That is, if language competence is necessary before strategy instruction, what is the criteria for determining sufficient language competence? At the university level, placement in ESL automatically assumes lack of language competence. Thus, ESL programs see their responsibility as linguistic development; once students have demonstrated minimal language proficiency, they are dismissed from ESL. This approach thereby excludes any opportunity for strategy instruction since by definition linguistically competent students are not enrolled in ESL courses.

The viewpoint of this dissertation, however, is that while university level ESL students frequently have severe deficiencies in the English language, their competence is at a level of proficiency that is conducive to strategy instruction. Moreover, it is the contention of this researcher that teaching students to be active users of reading strategies can compensate for many of their linguistic weaknesses.

The results indicate that, at the university level at

least, teaching international students to be active and reflective in their reading improves both their comprehension and their use of reading strategies. These results have implications for the teaching of reading to ESL students.

First, the inability of international students to comprehend text may stem as much from their lack of effective strategies as from deficiencies in syntax and word forms. However, at present, little progress has been made toward developing ESL instructional methods that improve the awareness and use of reading strategies. Consequently, ESL students do not receive instruction in becoming independent and self-regulating readers who are fully engaged in the constructive aspects of reading. This results of this study suggest that university ESL students are not only capable of receiving instruction in strategic reading, but benefit from this instruction.

This implies a need to change the approach and design of ESL reading instruction. As discussed earlier in this dissertation, traditional approaches to reading in ESL have been based on the premise that comprehension is inherent in language and can be decoded through extensive familiarity with linguistic structure and enhanced vocabulary, which suggests that reading is a passive activity with the reader as a receiver of information. Such an attitude is not supported by current research in literacy, where the reading process has been shown to be an active and complex involvement of constructing meaning from text (Pearson, Dole,

Duffy, and Roehler, 1989). According to this viewpoint, a reader does not passively look at text, but must use several sources of information in the processing of constructing meaning. These include the reader's knowledge of the interrelated dynamics of the reading process, such as the immediate purpose for reading, text structure and organization, and background knowledge.

Despite extensive research supporting this view, much of the ESL reading instruction remains devoted to workbook exercises wherein the student is required only to discover discrete points of information. For example, Long and Sato (1983) concluded that despite two decades of language teaching literature encouraging ESL instruction to focus more, or even exclusively, on the communicative aspects of language, ESL teachers continue to emphasize form over meaning, accuracy over communication. Dinsmore (1985) concurred commenting that ESL lessons often pass from meaningless activity to silence as teachers and students work at passing the time, and recommended that both ESL teachers and teacher trainers question the basis of ESL instruction.

At present, university ESL reading instruction focuses on testing and practice, using paragraphs or short selections followed by lists of questions and with no attention directed toward the strategic processes of reading although these processes are essential for comprehension of text (Brown, 1990). This approach to teaching reading with contrived reading material does not transfer to academic reading

situations wherein texts are complex, usually sequential, and contain extensive amounts of novel information that the reader is expected to comprehend and remember.

The results of this dissertation provide evidence that university level ESL programs can successfully provide students with instruction and practice in dealing with lengthy and complex academic texts. Moreover, the results, particularly the increased reports of comprehension monitoring by both treatment groups, indicate that such instruction encourages students to be reflective and more active in their approach to reading tasks, exactly the behaviors they need when they are dealing with academic materials.

Another implication of this study is that, as a teaching field, ESL needs not only to address the content of the reading curriculum but also the training of ESL teachers to implement the curriculum. For a strategy based curriculum to work, the instructors must themselves be knowledgeable of the nature and use of the metacognitive processes in reading, and be capable of competently teaching these processes. This means educating ESL instructors to be actively engaged in a mediational role rather than merely monitoring student responses to textbook exercises.

In the traditional approach, ESL instructors act primarily as technicians who provide tools for decoding. A TESOL (Teaching English to Speakers of Other Languages) degree is usually a master of arts conferred through a

linguistics or English department. Few candidates enter the programs with formal background in education, and the programs are not concerned with cognitive learning theory. Frequently, the only experience in teaching that ESL teachers have before they take on classroom responsibilities is what they have done as graduate assistants.

However, if the ESL reading curriculum incorporated metacognitive instruction, the role of the ESL teacher would change. The goal would be to provide the learner with means of a becoming independent, self-regulating reader.

This suggests another implication to be drawn from this dissertation. The results indicate that a university level ESL student can be given responsibility for learning. In the ESL reading instruction, classroom activity is centered on the teacher with the students as passive respondents. While this may logical in an approach that assumes the teacher has the essential information need for success, in practice it provides a false sense of the nature of academic reading. With the primary class activity focused on responding to exercises, the ESL student assumes that successful reading is concentrating on discrete points of information, and is not provided with experiences in what he or she will be expected to do in academic coursework.

This study suggests that when university ESL students are given the responsibility and opportunity to engage actively in strategic reading, their perception of reading changes. However, the results also indicate that this

change in perception requires time and practice before the student becomes an independent, self-regulating reader. Yet, ESL programs have a limited amount of time to devote to their students before they transfer to their academic program, after which student access to ESL is curtailed. Recognizing this limitation, the design and implementing of the ESL reading curriculum should be directed to providing international students with worthwhile and relevant instruction that fosters their development as capable and independent readers of English.

To sum up, the implications of this dissertation for teaching reading to ESL students are:

1. Since instruction in strategic reading and use of reading strategies of the kind provided in this study have a positive effect on university level ESL students' reading comprehension and their reported use of strategies, instruction in the active use of reading strategies should be incorporated in the ESL reading curriculum.
2. ESL classroom activities should be directed toward active reading, not filling out exercises. Class situations should be organized to encourage active interaction of readers with text. University ESL students do not need to sit behind desks listening to the ESL reading teacher talk about word forms for fifty minutes. They do need opportunities to learn and practice reading within the classroom situation.

3. ESL instructors must have a background in cognitive learning theories in general and with metacognitive processes in particular. In addition, ESL teachers need goal directed and supervised teaching experience before they are awarded a TESOL degree.
4. ESL reading materials need to be longer and more complex and should reflect the real language of academic coursework.
5. International students should be given more responsibility for their own learning. ESL instructors need to shift their instructional approach to a mediational role that encourages students to be aware and active while reading.

Implications for Future Research

While this study suggested that instruction in strategic reading and use of reading strategies improves ESL students' reading performance, the results are inconclusive due to the brief treatment period.

Further research replicating and extending this study is needed. Larger samples are needed and students of different language and educational background need to be studied. In addition, improved measures of both comprehension and reports of strategy use need to be developed and tested.

Research is also needed to determine if certain strategies, such as comprehension monitoring, have more impact on ESL students' reading comprehension than others.

Finally, research investigating the effects of training ESL instructors in cognitive learning theories and teaching strategic reading is needed.

Summary of Chapter Five

The results of this study indicate that using SQ3R as a medium for teaching strategic reading and use of reading strategies is beneficial for ESL reading instruction. These results have implications for ESL curriculum development, training of ESL instructors, and the role of ESL students in classroom activities.

The findings of this dissertation suggest that future research needs to address three specific areas. First, the study should be replicated and expanded to include larger samples and subjects of different linguistic and educational backgrounds. In addition, measures need to be revised and improved to effective gather data. Additional research is also needed to identify specific strategies that would be particularly useful for ESL students. Finally, effects of training in strategic reading on ESL instructors should be investigated.

APPENDICES

Appendix A

STRUCTURE OF THE MALAYSIAN EDUCATION SYSTEM

Primary and Secondary Education

United States	Malaysia	Notes
1st Grade	Standard 1	
2nd Grade	Standard 2	
3rd Grade	Standard 3	
4th Grade	Standard 4	
5th Grade	Standard 5	
6th Grade	Standard 6	All students are given an assessment exam in Standard 5, but automatically move to Form I after completing Standard 6
7th Grade	Form I	
8th Grade	Form II	
9th Grade	Form III	All Form III students take the SRP examination. Students who pass continue on with Form IV and Form V. Those who do not pass are dismissed from public education
10th Grade	Form IV	
11th Grade	Form V	All Form V students take the SPM examinations. Those who fail receive a general certificate and are dismissed from public education. Those who pass are assigned to post-secondary options.

Post-Secondary Options

Program	Notes
Form VI	Intensive two year pre-university training. At the end of Form VI, students take the STPM examination. Those who pass are assigned to a local University for degree study.
Diploma Courses	Several programs of various length, including the two year teacher training program, technical training courses, and secretarial colleges. The largest number of diploma programs are offered by ITM, which is open to Malays only.

Program	Notes
Matriculation	One or two year programs sponsored by local universities. Students are admitted to a degree program if their grades are adequate.
Local University	Offer a variety of degrees. Eligible students are assigned to a university by the government. Sixty percent of all openings are reserved for Malays
Foreign University	Students are sponsored by the government and either sent directly to universities in Britain, Australia, or the United States or participate in a two year matriculation program, such as the ITM/MUCIA project, before entering the university. Ninety percent of sponsored openings are reserved for Malays. ITM programs are open to Malays only.

Appendix B

ESL COMPOSITION PROFILE

CONTENT

	Range	Description
(A)	25-23	EXCELLENT TO VERY GOOD Knowledgeable, thorough development of topic, relevant
(B)	22-20	GOOD TO ABOVE AVERAGE Some knowledge of subject, topic is developed, but lacks detail, mostly relevant
(C)	19-18	AVERAGE TO FAIR Limited knowledge of subject, topic not fully developed, lacks detail, some irrelevant support
(D)	17-15	POOR Little knowledge of subject, inadequate development of topic, mostly irrelevant support
(F)	14-1	VERY POOR No apparent knowledge of topic, topic undeveloped, irrelevant support or Not enough to evaluate

ORGANIZATON

	Range	Description
(A)	25-23	EXCELLENT TO VERY GOOD Fluent expression of ideas, logical organization and sequencing, unified
(B)	22-20	GOOD TO ABOVE AVERAGE Somewhat fluent expression of ideas, topic sentence supported, but may lack details

(C) 19-18 AVERAGE TO FAIR

Expression often lacks fluency, limited support of topic sentence, ideas may sometimes be confused, development may be illogical

(D) 17-15 POOR

Non-fluent, ideas are confused or disconnected, lacks logical development

(F) 14-1 VERY POOR

Does not communicate, no real attempt at organization
or
Not enough to evaluate

VOCABULARY

Range	Description
(A) 25-23	EXCELLENT TO VERY GOOD

Sophisticated range, effective word choice and usage, word form mastery

(B) 22-20 GOOD TO ABOVE AVERAGE

Fairly sophisticated range, may have occasional errors in word choice, meaning is clear

(C) 19-18 AVERAGE TO FAIR

Adequate range, some errors in word choice, meaning is occasionally unclear

(D) 17-15 POOR

Inadequate range, frequent errors in word choice, meaning is sometimes unclear

(F) 14-1 VERY POOR

Little knowledge of English vocabulary, little knowledge of word forms
or
Not enough to evaluate

LANGUAGE USE

	Range	Description
(A)	25-23	EXCELLENT TO VERY GOOD Effective complex constructions, syntax variety, very few errors in spelling, punctuation, and capitalization
(B)	22-20	GOOD TO ABOVE AVERAGE Effective simple constructions and few errors in complex constructions, few errors in negation, agreement, tense, number, word order, function, articles, pronouns, and prepositions, few errors in spelling, punctuation, and capitalization
(C)	19-18	AVERAGE TO FAIR Some errors in simple and complex constructions, some errors in negation, agreement, tense, number, word order, function, articles, pronouns, and prepositions, presence of fragments, run-ons and common splices, may have some errors in spelling, punctuation, and capitalization
(D)	17-15	POOR Frequent errors in simple constructions and no attempt at complex constructions, frequent errors of agreement, tense, number, word order, function, articles, pronouns, and prepositions, presence of fragments, run-ons and common splices, frequent errors in spelling, punctuation, and capitalization
(F)	14-1	VERY POOR No mastery of sentence construction, grammar, or rules of mechanics, dominated by errors or Not enough to evaluate

Appendix C

ESL READING SYLLABUS

Instructional Objectives

1. General Instructional Objective
   The student selects and employs the necessary language skills, and comprehension strategies that are necessary for comprehending academic materials that have been written in a variety of modes.

2. Learning Outcomes
   Upon completion of the course, students will
   1. apply pre-reading strategies before reading, including
      a. predicting audience, purpose, and content,
      b. identifying the thesis of a selection,
      c. using headings and subheadings,
      d. using key vocabulary to derive predictions,
      e. using pictures, charts, or graphs,
      f. using questions at end of a text to predict content,
   2. recall explicitly stated information,
   3. recall the main ideas of a selection by restating the logical sequence of ideas,
   4. infer information that is not explicitly stated,
   5. distinguish between explicit facts and implied information
   6. identify author's purpose by
      a. showing how the use of style, tone, and choice of vocabulary indicates purpose,
      b. detecting author's attitude toward topic,
   7. use critical reading skills such as
      a. distinguishing between facts and opinions,
      b. identifying cause-effect relations,
      c. formulating appropriate conclusions about information
      d. specifing content to support these conclusions, and
   8. independently use reading skills and strategies such as
      a. outlining and summarizing to discriminate between main ideas and supporting details,
      b. using the text organization as an aid to comprehension
      c. drawing inferences and conclusions,
      d. taking notes and marking text, and
      e. recognizing problems and developing strategies to solve the problems, such as rereading, checking another source, or writing questions to ask instructors.

Grading:

1. Class Tests 50% 2. Midterm 25% 3. Final 25%

Work will be assigned points according to the Indiana University system:

97-100	A+	83-86	B	70-72	C-
93-96	A	80-82	B-	67-69	D-
90-92	A-	77-79	C+	63-66	D
87-89	B-	73-76	C	60-62	D-

Instructional Schedule

Weeks 1 - 3 (Biology)

a. Textbook Sample: "The Chemical Background for Biology"
b. Articles:
   1. "The Natural History of AIDS"
   2. "The Cruel Logic of Our Genes"
c. Supplementary:
   1. "Molecules of Memory"
   2. "Junk Food Monkeys"

Weeks 4 - 6
(Sociology & Anthropology)

a. Textbook Samples:
   1. "The Scope and Method of Sociology"
   2. "What is Anthropology?"
   3. "Culture and Its Transmission"
b. Articles:
   1. "The Great Leap Forward"
   2. "The Thera Theory"
c. Supplementary:
   1. "The Education of a Samoan Child"
   2. "What Does It Take to Be a Meat Eater?"

Weeks 7 - 10 (Environmental Science)

a. Textbook Sample: "Some Matter and Energy Laws"
b. Critical Thinking, Critical Choices
   Unit 2, "The Ecosphere"
c. Articles:
   1. "You CAN Keep a Good Forest Down"
   2. "Rape of the Rain Forest"
d. Supplementary:
   1. Critical Thinking, Critical Choices
      Unit 3, "Peaceful Coexistence"
   2. "The Gripping Story of Paranthropus"
   3. "The Accidental Conquerer"

Weeks 11 - 13 (Business)

a. Textbook Sample: "Societal Challenges Facing Business"
b. Article: "Consumer Behavior: Basic Concepts"
c. Supplementary: "Key Business Decisions"

Weeks 14 & 15 (Psychology)

a. Textbook Sample: "Perception"
b. Article: "Depression at an Early Age"
c. Supplementary: "Intrinsic and Extrinsic Motivation"

Supplementary Articles:

Alper, J. 1986. "Depression at an Early Age," Science 86 7, 5:47-50.

Benderly, B. L., Gallagher, M. F., and Young, J. M. 1977. "What is Anthropology?" In Discovering Culture: An Introduction to Anthropology. Wadsworth Publishing: Belmont, CA.

Diamond, J. 1989. "The Accidental Conquerer," Discover 10, 12:70-76.

Diamond, J. 1989. "The Cruel Logic of Our Genes," Discover 10, 11:72-79.

Diamond, J. 1989. "The Great Leap Forward," Discover 10, 5:50-60.

Gonda, M. A. 1986. "The Natural History of AIDS," Natural History 95, 5:78-81.

Miller, E. T. 1987. "Some Matter and Energy Laws". In L. D. Latulippe (Ed.), Developing Academic Reading Skills, Prentice-Hall: Englewood Cliffs, NJ.

Montgomery, G. 1989. "Molecues of Memory," Discover 10; 12:46-55.

Shipman, P. 1988. "What Does It Take to Be a Meat Eater," Discover 9, 9:38-45.

Sapolsky, R. M. 1989. "Junk Food Monkeys," Discover 10, 9:48-51.

Uhl, C. 1983. "You Can Keep a Good Forest Down," Natural History 92, 4:70-79.

Appendix D

THE SQ3R STUDY SYSTEM

The SQ3R study system is taught by many reading instructors. The letters stand for the five steps in the process: (1) Survey, (2) Question, (3) Read, (4) Recite, (5) Review. Explanations of the five steps follow.

STEP 1 Survey

Survey or preview the selection before you begin reading closely. Quickly skim through the material, noting the title and main headings, the first and last paragraphs, words marked in boldface or italics, and pictures and charts.

* How long do you think a preview of a one-page article should take?

_____

* How long do you think a preview of a twenty-five page chapter should take?

_____

The length of the preview will vary with the nature of the material and your purpose in reading. In general, though, a preview of a one-page article might take a minute or so, and the preview of a chapter might take four or five minutes.

STEP 2 Question

As you start reading closely, ask questions about the material. Turn the title and subheadings and other key words into basic questions. Use simple question words such as <u>who</u>, <u>what</u>, <u>when</u>, <u>where</u>, or <u>why</u>. For example, if the first heading is "The Nature of Power," ask yourself, "What is the nature of power?" The look actively for the answer to the question. Keep asking questions and trying to guess what will come next all through your reading. The questions will help you concentrate on the material and make your reading an active rather than a passive process.

* What basic question could be made out of the chapter title, "Deviant Behavior"?

_____

* What question could be made out of the heading, "The Myth of the Southern Gentlemen"?

_____

STEP 3 Read

Read the selection carefully. Look for answers to your questions and change the questions when necessary. Try to spend more time with the material that seems most important and go quickly through material that seems less important. You may want to use a pen as you read to highlight key points.

STEP 4 Recite

Look away after you complete a section. See if you can recite to yourself the important points in the material. This recitation will make clear exactly what you know and what you don't. Go back and reread as necessary until you can recall all the important material in a section.

While carrying out this step, you may also want to write down all the information you feel you must remember on a separate sheet of paper. This information can be in the form of basic questions and your answers to the questions. It can also be in an outline form. Such study notes will help you with the last step of SQ3R.

* Do you study material mainly by reading and rereading or mainly by reading and reciting?

STEP 5 Review

Go back over all the material. You have already tested yourself on individual sections; now study until you can recite to yourself all the important ideas in the selection. If you have taken written notes from the start, the material will be much easier to review.

Appendix E

PRETREATMENT READING SELECTION

Selection from "The Origin of the Earth, Its Oceans, and Life in the Oceans"

Origin of the Atmosphere and Oceans

The solidification of the earth's crust marks the beginning of geologic history, and evidence indicates that this event occurred about 4.5 million years ago. At this time the earth had lost all but a small fraction of its original gas envelope. It would seem improbable that there would have been much of an atmosphere surrounding the earth at this time, if we consider the tremendous amount of energy that was being radiated from the earth as it cooled from its molten condition.

All of this heat energy was made available to the molecules of the atmosphere, and they undoubtedly would have been able to achieve a velocity well above that required to escape the earth's gravitational field. The lighter the molecule and the higher the energy of that molecule, the greater is the probability that a gas composed of such molecules will escape from the earth's surface. It has been calculated that when the average molecular velocity in an atmosphere exceeds one-fourth of the planet's escape velocity, which for earth is 11.4km/s, the atmosphere will be lost into space within a relatively short period of time. At present hydrogen and helium are rapidly lost from the earth's atmosphere, while gases such as oxygen and nitrogen, composed of heavier molecules, are retained.

The Atmosphere Forms

Where did the material to make the present atmosphere and ocean come from? Although the earth's surface had become relatively cool by this stage in its development, there was still much volcanic activity according to the geologic record. As volcanic gases bubbled up from the earth's upper mantle, they formed a new atmosphere as soon as the earth had cooled enough to retain one. This atmosphere was far different from the one that the earth had lost and from the one that it presently has. It contained little free oxygen and was composed of large percentages of carbon dioxide and water vapor. As the earth cooled to the point at which it could retain these gases, a vast envelope of clouds surrounded the planet, causing the earth to reflect about 60 percent of all the sunlight that was directed toward it. Most of the energy it absorbed from the sun remained in the thick envelope of gases and did not reach the surface of the solid earth.

Water vapor released from the surface of the earth was captured in the thick envelope and was forced to remain there as a vapor until sufficient cooling of the earth's crust would allow it to condense and begin to accumulate as a liquid. Eventually, cooling of the crust allowed the water vapor to condense and fall under the force of gravity to the earth's surface. Finally, with further decrease in the surface temperature, permanent accumulation of water began in depressions on the earth' irregular surface.

The Oceans Evolve

These accumulations were the initial oceans on planet earth, and it is assumed that this water has been permanently in existence since its formation. The oceans were probably somewhat less saline than the present oceans, but the primary crystalline rocks that made up the earth's crust were weathered and eroded. The inorganic compounds of which they were composed were dissolved in the waters that fell relentlessly upon their surfaces and were carried into the newly forming oceans.

The process of cooling the earth's surface, which allowed the water vapor to finally condense and accumulate to form the earth's first oceans, was accelerated by water's property of high heat capacity. The heat energy that prevented the water from accumulating on the earth's surface was being absorbed by that massive cloud of water vapor and carbon dioxide that surrounded the earth's surface. As the individual molecules of water absorbed the heat at the earth's surface and moved through the cloud to its outer edges where they were frozen into ice crystals, large quantities of heat were released into outer space. We might say that water vapor was working hard to achieve its ultimate goal of establishing for itself a permanent resting place on the earth's surface.

The Chemical Balance Sheet

As chemical weathering of the primary rocks that composed the original earth's crust was made possible by the appearance of water, the process of chemical weathering should be considered. As a result of chemical weathering, the elements that were contained in the primary crystalline rock were freed, dissolved in the water, and carried off to accumulate in the ocean. As the water carried these dissolved elements and compounds into the ocean, it also carried a great load of particulate material that had been weathered and eroded from the crystalline rocks and deposited this material as sediment. The components of the primary crystalline rock that were freed by chemical weathering must be found (1) dissolved in the ocean, (2) as components of the earth's atmosphere, or (3) chemically bound with the sediments that have been carried into the sea by the rivers.

The estimates that have been made for these various

amounts, of course, will not be exact. The estimate for the ocean is probably one of the most accurate, since the ocean volume is relatively well known and its composition is comparatively uniform because it is well mixed. The estimates are less accurate for crystalline rock, which is quite heterogeneous, and for the sediments, which are of various types. Nevertheless, geochemists have drawn up balance sheets for the various elements and those calculated by different individuals working on the problem agree fairly well. For those elements which are most common in crystalline rocks, the geochemical equations balance well within the limits set by the accuracy of the estimates.

Excess Volatiles

There are some components that do not balance in any of the attempts that have been made. These elements and compounds appear to be much more abundant in the atmosphere, the ocean, and the sediments than can be accounted for by the volume of crystalline rocks which have been estimated to have undergone chemical weathering. All of these substances that are found in excessive amounts compared to the products of chemical weathering are volatile (gaseous) at or slightly above the average temperatures found at the earth's surface and are therefore called excess volatiles. Most abundant of the excess volatiles are water vapor and carbon dioxide; also important are quantities of chlorine, nitrogen, sulfur, hydrogen, and flourine.

Volcanic activity is presently producing these gases and venting them into the earth's atmosphere. A great percentage of the gases that surface as a result of volcanic activity may simply be recycled volatiles that have been dissolved in groundwater and carried down from the earth's surface, but it has been determined that a small percentage of the total volatiles is always composed of new gases that have for the first time been released from the crystalline rock of the earth's crust. When molten magma cools, solid minerals are formed and some of the gaseous constituents of the magma are freed. These gases, freed during the crystallization process, represent the new material coming to the earth's surface from the mantle.

Appendix F

POSTTREATMENT READING SELECTION

Selection from "The Origin of Ocean Basins: The Theory of Plate Tectonics"

The fact that we live on a dynamic earth on which movement is the rule rather than the exception has long been accepted by geologists. Geologic processes responsible for the ever-changing landscape of the continents are believed to require long periods of geologic time to build such features as mountains. However, many geologists were not prepared until recent years to accept, along with the movements associated with the building of mountain ranges, a dynamic characteristic of the earth that was of a much broader scope -- the movement of continents. When geologists speak of the movement of continental masses across the earth's surface, they sometimes refer to this phenomenon as continental drift.

Marine geologists who have studied the ocean floor and recently developed theories concerning why the continents are moving relative ot one another may use the term sea floor spreading. The name for this theory is derived from evidence indicating the the new oceanic crust and rigid upper mantle material is being formed along the axes of a series of midocean ridges and rises. The newly formed material then moves down both slopes away from the axes. The continents float on this denser material and are carried along by the moving layer of denser rock.

A third term used to encompass the totality of the proces is plate tectonics. Study of the process has indicated that there are a number of major plates into which this rock sphere, or lithosphere, can be divided. The interaction of these plates as they move builds the structural features of the earth's crust that can be observed by geologists. Thus, tectonics refers to the building of the earth's crustal structure and is dervied from the Greek tektonikos, which means to construct.

The possibility that the continents may be moving across the surface of the earth is not new. Such a possibility was suggested early in the 19th century, and the first theory attempting to explain the movement was presented in 1912. With such a long history of awareness of the possibility of such movement, why has acceptance of theories related to the process been so long in coming?

Development of the Theory

The first scientific observations related to the possible breakup of the continents that moved to either side of the Atlantic Ocean were made by Antonio Snider-Pelligrini in 1858. He presented the first reconstruction of the continents as they may have existed prior to their

separation. He considered that the 300-million-year-old coal deposits so widespread in western Europe and eastern North America must have been deposited when these landmasses were united.

Also using geological evidence, particularly the origin and alignment of mountain ranges on opposite sides of the Atlantic, were two Americans, Frank Taylor and Howard Baker. Taylor, who included in his discussion the possible origin of these mountain ranges, presented in 1908 a well-developed argument for large-scale continental movements.

Alfred Wegener, however, is considered by most scientists to be the pioneer of the modern continental drift theory. This German scientist originally was drawn to the concept in an attempt to explain the ancient climates that were recorded in the rocks deposited in ocean basins and on landmasses of the past. Wegener's theory was published in 1912 and met a great deal of resistance from the scientific community.

Wegener considered that about 200 million years ago all of the continental mass of the earth was one large continent, Pangaea. About 180 million years ago, the continent began to break up and the various continental masses we know today started to drift toward their present position. Since it was impossible at that time to present evidence that would support a mechanism for such transportation, the theory did not receive wide acceptance.

It is interesting that John Joly, an Irish physicist, suggested that the heat generated in the interior of the earth by radioactive decay found its way to the surface through slowly moving convection cells that could carry the continents laterally across the earth's surface. Although we call on such a process today to account for the movement of continental masses, Joly's theory ran into great difficulty because there were no observational data that would indicate the presence of convection cells in the earth's interior. Such a theory was further developed by Arthur Holmes in 1927. Holmes, a strong proponent of continental drift as a geological reality, derived much of his supporting data from the radioactive methods of dating rocks, a field in which he was a pioneer.

Although many Southern Hemisphere geologists had accepted continental drift as a geological reality, it was not until the 1950's that geologists of the Northern Hemisphere began to give it serious attention. The impetus for the renewed attention arose from the study of the earth's ancient magnetism. The British geophysicist, S. Keith Runcorn, explained his observations of the magnetic properties of the rocks of Europe and North America in terms of continental movements.

On the basis of this study of the earth's ancient magnetic fields, convincing arguments could be made for the fact that the continents had drifted relative to one another. As study continued, more evidence was gathered to support this movement, and additional data suggested the mechanism by which the movement might have taken place. In the next

section, we will outline in some detail the early observations that led to the intial interest in the theory of continental drift.

Continental Jigsaw

We should consider how well the continents do fit together. Attempts were made by many of the early investigators to arrange the continents in a manner that would achieve a reasonable fit and support their data. Most of these attempts used the existing shoreline as the margin of the continent. However, the continental shelf and the continental slope should also be considered to be part of the continental mass. Studies of the magnetic intensity and gravitational attraction of the earth's crust support such a contention.

There is a distinct increase in the magnetic intensity of oceanic crustal rocks over that of the continental crustal rocks, and the gravitational attraction over the ocean is measurably greater than that at the same elevation on the continents. The increase intensity of the magnetism of the rocks is caused by higher iron content of oceanic crustal rocks, while the increased gravitational attraction indicates a higher average density of the oceanic crustal material as compared to that of the continent.

Sir Edward Bullard, an English geophysicist, constructed a computer fit of all the continents in 1965. The arrangement that produced minimum overlaps and gaps was found to be formed by continents outlined by the 2000-m-depth contour. This contour represents a depth that is approximately halfway down the continental slope. The greatest doubt as to the fit presently lies along the east coast of Africa, where the margin of the continent is not so easily defined. In general, the fit of the continents is remarkably good, and it is difficult to explain such a fit without having to consider very strongly the possibility that these continents were at one time united.

Appendix G

PRETREATMENT SCORING MEANSURE

Origin of Atmosphere and Oceans

(Solidifying of Earth's Crust)	Pts
Earth's crust solidified [about 4.5 billion years ago]	2
a. Tremendous amount of heat energy was lost	1
b. Hydrogen & helium molecules escaped from earth	1
c. Oxygen & nitrogen molecules remained	1
(The Atmosphere Forms)	
Material for atmosphere & oceans came from volcanic activity which released water vapor	2
a. As earth cooled, water condensed into rain	1
b. Further cooling cause water to form on surface	1
(The Oceans Evolve)	
The oceans evolved from water formed out of the atmosphere	2
a. Oceans were less salty than now	1
b. Crystalline rocks dissolved in waters	1
c. Cooling of earth was helped by water	1
d. Some heat was absorbed by clouds and released into space	1
(The Chemical Balance Sheet)	
[Because of chemical weathering], elements in crystaline rocks was dissolved & taken to oceans	2
a. Other materials became sediment	1
b. Material from crystalline rocks are found in ocean, atmosphere, or sediment	1
c. Amounts of material in each area can only be estimated	1
d. Amounts in ocean probably most accurate estimate	1
e. Estimates in rock least accurate	1
f. However, scientists have drawn up balanced estimates	1
(Excess Volatiles)	
Excess Volatiles are excess substances in a gaseous (volatile) state	2
Most abundant are water vapor & carbon dioxide	1
Excess volatiles come from volanos	2
a. Most excess volatiles are recycled	1
b. Some are new gases freed by volcanic heat	1

Appendix H

POSTTREATMENT SCORING MEASURE

Origin of Ocean Basins

Earth's continents are moving across the earth's surface 2

Three types of continental movement 2
- a. Continental drift -- movement of continental mass 1
- b. Sea floor spread -- movement of sea floor 1
- c. Plate techtonics -- movement of plates 1

Development of the Theory

First continental reconstruction was proposed [by Antonio Snider-Pelligrini in 1858] 2
- He suggested that coal was deposited in Europe and North America when continents were united. 1

Mountain ranges were used as evidence [by Frank Taylor and Howard Baker] 2
- Well developed argument presented by Taylor in 1908 1

Alfred Wegener is considered the pioneer of modern drift theory [1912] 2
- He tried to explain the ancient climates 1

Wegener's Theory: Continental mass was originally one continent, Pangaea 2
- a. 180 million years ago the continent broke up and parts began to drift 1
- b. Wegener's Theory was not well accepted 1

John Joly suggested that heat from earth's interior created convection cells 2
- a. Process explains continental movement 1
- b. Evidence provided by Arthur Holmes in 1927 1

Geologists in northern hemisphere did not give theory attention until 1950's 2
- a. Arose from study of ancient magnetism 1
- b. Magnetic properties explained by continental drift [by S. Keith Runcorn] 1

How well do continents fit together? 2
- a. Early attempts used shoreline 1
- b. Continental shelf and slope work better 1

Computer fit of continents constructed [in 1969 by Sir Edward Bullard] 2
- a. Best arrangement was at 2000 m depth 1
- b. Overall continental fit is good 1

Appendix I

STRATEGY USE EVALUATION FORM

1. Recall of general knowledge (RK) -- subject reports relecting on previously known information before reading.

2. Surveying (SV) -- subject reports previewing the selection before reading and identifies previewing skills such as reading headings and subheadings, looking at graphs and diagrams, etc.

3. Formulating questions (FQ) -- subject reports generating questions to answered while reading.

4. Using text organization (TO) -- subject reports using organizatonal devices included in the text to help ease reading, such as signal words, transitions, etc.

5. Using general knowledge (UK) -- subject reports referring to knowledge and experience to explain, clarify, question, or extend information from the text while reading.

6. Using repair strategy (RS) -- subject reports using a strategy, such as looking back, to resolve a comprehension problem.

7. Taking Notes (NT) -- subject reports making notes for later reference while reading.

8. Underlining or highlighting (UL) -- subject reports marking important items in the text by underlining or highlighting with a marker.

9. Reviewing (RV) -- subject reports systematically reviewing notes and marked items, recalling the information, etc.

10. Comprehension monitoring (CM) -- subject reports comprehension throughout the reading activity.

11. Other strategies (OT) -- subject reports using a strategy that is not covered by any of the above catagories.

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