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RATCHFORD, DONALD LEE

READING ABILITY OF ENTERING FRESHMEN INTERNATIONAL STUDENTS AT A SOUTHWESTERN STATE UNIVERSITY: SOME IMPLICATIONS

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A

DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

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degree of

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BY

DONALD LEE RATCHFORD

Norman, Oklahoma

1981

READING ABILITY OF ENTERING FRESHMEN INTERNATIONAL STUDENTS AT A SOUTHWESTERN STATE UNIVERSITY: SOME IMPLICATIONS

APPROVED BY:

Caryl L. Adams
Dr. Caryl L. Adams, Chairperson

Dr. William H. Graves

Edmund C. Nuttall
Dr. Edmund C. Nuttall

Chipman G. Stuart
Dr. Chipman G. Stuart

Donald S. Udell
Dr. Donald S. Udell

DISSERTATION COMMITTEE

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CHAPTER I

THE PROBLEM

Introduction

There are great expectations placed on an individual to acquire the skills necessary to succeed in a society. The educational institutions are given the responsibility of insuring the acquisition of those skills. Of the many skills to be acquired, reading receives the greatest attention. In fact, American schools have been called "reading" schools. "In large part this appellation results from the dominant role ascribed to the content area textbook in the American educational setting. There can be little doubt that textbooks have been a convenience for both educator and student. It has been used to simplify decisions on matters of budget, curricula, course objectives, course content, methods of instruction, and student evaluation" (Kingston, 1967); and "it has served as a source for student catechism, hostility, and narcosis" (Hill, 1979).

This significant position of the textbook emanates from two key assumptions and their resulting practices. "The first is that the form of the textbook should be a scholarly, encyclopedic, yet concentrated survey of the

facts and ideas, pertinent to the content area. The second and related assumption is that such a textbook provides the greater majority of students with an adequate source and mode of learning" (Kingston, 1967).

The American content area textbook presents a formidable reading-learning task even when the student has some mastery of reading and study procedures. It is lengthy, densely filled with concepts, extremely difficult in general vocabulary, and written in a generalized impersonal manner (Hill, 1967). For the international student the reading-learning task is compounded.

International students are present at almost every university or campus, and in nearly every classroom. Carlson (1971) reports that in the 1969-1970 school year some 135,000 international students were attending institutions of higher education in the United States. The university which this researcher attends is no exception. Of the approximately 21,000 students enrolled, some 1,800 are international students, a ratio of approximately twelve to one.

Some international students in an English speaking university are frequently called upon to read far more material than they are capable of handling in the time allotted; that is, they can not read the material rapidly enough, comprehend it well enough, nor retain it long enough to keep up with the native speakers in the same classes (Jordan, 1975). Often this lack of reading "competency" is a result of the student's training, having been limited to reading "general" English so that he has not been taught to cope with the complex structures of scientific and technical English; or it may be the result of training not stressing the special nature of the linguistic act of reading complex and dense material (Eskey, 1975).

Studies by Trimble (1976) show that while many international students can understand every word in a sentence and every sentence in a paragraph, they cannot grasp the function of that paragraph rapidly enough for the reading process to be efficient. This may occur because reading involves the interaction of language and thought as language is decoded and meaning is reconstructed (Goodman, 1968). In light of Goodman's definition of reading, it can be hypothesized that the limited knowledge of the structure of the English language by many international students is a causative factor in their performance on varied reading materials.

It is apparent that many international students experience academic difficulty. A large percentage of the difficulty can be attributed to poor reading skills and the inability to communicate effectively in English. These factors may contribute to a vast communication gap between students, instructors, and instructional materials. How to successfully bridge the communication gap for international students is a major concern of instructors in American institutions of higher learning (Whittaker, 1977).

Statement of the Problem

Stated concisely, there is a need to explore the relationship of international freshmen students' reading ability to the readability of college material. Such an exploration should provide instructors and administrators with a comparison of various reading levels and the reading ability of international students. The exploration may supply administrators with a new dimension for evaluating the potential of international students entering the university, with reference to their predictive success in college.

"Educators [should] have a valid method of finding out whether instructional materials are understandable to their students, for students should acquire much of their knowledge by reading written instructional materials" (Bormuth, 1968). Currently, institutions of higher education use three main tests to evaluate the reading ability of international students: (1) a standardized reading test, (2) tests using the cloze procedure, and (3) a standardized language proficiency test. Perhaps the most used method for this purpose has been the cloze test. The cloze test, as devised by Taylor (1953), briefly, is a procedure in which a 250 word passage has a ten space blank substituted for every fifth word, producing a fifty-item test. The examinee's task is to fill in the exact missing word. Regardless of how effective this procedure has been, it would be nearly impossible, mechanically as well as financially, to construct such tests on each institution's textbooks and to administer the tests to all entering international students. Thus a more efficient means must be found.

Purpose of the Study

The purpose of this study was to determine to what degree international undergraduate freshmen students can read their textbooks, and what implications this may have for international students seeking admission to a Southwestern state university.

One intent of this study was to determine which test, Test of English as a Foreign Language (TOEFL), the Nelson-Denny Reading Test, or tests using the cloze procedure, can best predict the reading ability of international students.

Another intent of this study was expressed in the TOEFL Bulletin of Information and Registration Form (1978):

> Because institutions vary widely in the kinds of students they admit and the language demands they place upon them, each institution should attempt to determine those TOEFL score ranges that can be used most reasonably to direct foreign students to one course of action or another. This can best be done following the academic careers of the foreign students admitted. If admission standards are set excessively high for competency in English, limitations in English will not be a factor in determining the academic success of enrolled foreign students. However, excessively high requirements in English proficiency may prevent otherwise highly qualified applicants from gaining admission. If the standards are too low, students will not be able to perform at the required level. For these reasons, institutions should attempt to set standards that are consistent with their own requirements and reflect the services they are willing to provide foreign students; these standards should be altered when empirical evidence shows change is in order.

Stated briefly, this study was an attempt to investigate those standards set by this university concerning admission of international students, and to determine if those set standards are adequate or in need of change.

In summation, the purpose of this study was to provide answers to the following questions:

1. In predicting the general and content reading ability of entering international freshmen, which test used (TOEFL, Nelson-Denny Reading Test, or tests using the cloze procedure) is the most valid instrument when compared to a reading grade level determined by the professional judgment of a panel of reading experts?

2. To what extent are international students, seeking enrollment at a Southwestern state university, able to read general textbooks and those of their designated major (as determined by cloze tests and the professional judgment of a panel of reading experts)?

Definition of Terms

In order to standardize the terminology of this study, each of the following terms has a specific meaning:

Content Textbooks - A textbook in a specified major content area such as: Electrical Engineering, Computer Science, or Special Education; as determined by the faculty of the content field.

Entering freshmen international students - This phrase is used throughout the study to refer to those international students used in this study who are currently enrolled as freshmen at the University of Oklahoma or who are potential candidates with TOEFL total scores less than the 550 required for entrance to the University of Oklahoma.

General Textbooks - A textbook of a required lower level core course (Freshman and/or Sophomore) as determined by the Regents of Higher Education and the faculty of the content field.

He, Him, His - To maintain the continuity of this writing, he is used solely in the generic sense.

Readability - The level of difficulty of reading materials or the reading ability one needs to read the material.

Reading - Reading is not extracting meaning from printed sources in various typographical arrangements, it is taking meaning to the print. This process includes the purposeful integration of reader motivation, personal resources, and learned behaviors necessary to the location of, interpretation of, and reaction to printed media.

Cloze Test Levels - as determined by Rankin and Culhane (1969).

1. Independent Level - student correctly replaces sixty-one percent or more of the deleted words on the cloze test.

2. Instructional Level - student correctly replaces forty to sixty percent of the deleted words on the cloze test.

3. Frustration Level - student correctly replaces thirty-nine percent or less of the deleted words on the cloze test.

Reading Competency - Independent level of reading as determined by sixty-one percent or above on the cloze test.

Hypotheses

Ho_1: There is no relationship between entering freshmen international students' general reading ability (as measured by the General cloze test) and the readability of their general textbooks (as determined by the Dale-Chall Readability Formula), and TOEFL Total scores.

Ha_1: There is a relationship between entering freshmen international students' general reading ability (as measured by the General cloze test) and the readability of their general textbooks (as determined by the Dale-Chall Readability Formula), and TOEFL Total scores.

Ho_2: There is no relationship between entering freshmen international students' ability to read material or their major field (as measured by the Non-Science and Science cloze tests) and the readability of their designated content area textbooks (as determined by the Dale-Chall Readability Formula), and TOEFL Total scores.

Ha_2: There is a relationship between entering freshmen international students' ability to read material of their major field (as measured by the cloze test) and the readability of their designated content area textbook (as determined by the Dale-Chall Readability Formula), and TOEFL total scores.

Ho_3: There is no relationship between entering freshmen international students' general reading ability (as determined by the professional judgment of a panel of reading experts) and scores on the Nelson-Denny Reading Test, (subtests: vocabulary, comprehension and total), general cloze test, and the Total score on the TOEFL examination.

Ha_3: There is a relationship between entering freshmen international students' general reading ability (as determined by the professional judgment of a panel of reading experts) and scores on the Nelson-Denny Reading Test (subtests: vocabulary, comprehension, and total), General cloze test, and the total score on the TOEFL examination.

Ho_4: There is no relationship between entering freshmen international students' content (Non-Science and Science) reading ability (as determined by the professional judgment of a panel of reading experts) and those scores on the Nelson-Denny Reading Test, (subtests: vocabulary, comprehension, and total), content cloze test, and the Total score on the TOEFL examination.

Ha_4: There is a relationship between entering freshmen international students' content (Non-Science and Science) reading ability (as determined by the professional judgment of a panel of reading experts) and scores on the

professional judgment of a panel of reading experts) and scores on the Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension and Total), Non-Science and Science cloze tests and the Total score on the TOEFL examination.

Assumptions

The study was based on several assumptions. The first assumption was that those international students randomly selected for this study were representative of the population of international students currently attending this Southwestern state university, as well as representative of those potential international students seeking admission to this university. The second assumption is that the cloze procedure is a valid means of determining an international student's ability to read college level materials. The third assumption is that the Nelson-Denny Reading Test is a valid means of determining international students' general reading ability. The fourth assumption is that the general and content textbooks analyzed in this study are representative of the general and content textbooks utilized at the University of Oklahoma.

Limitations

The textbooks used in this study were limited to those used by the Southwestern state university where this study took place. The sample of international students was limited to those who were enrolled or seeking enrollment at the same university, who had four to six years of English instruction, and who had not been in an English speaking country for more than eight months. Another limitation of the study concerned the construction of the

cloze tests. Content areas for use in constructing the cloze tests were selected according to the number of international freshmen students enrolled in major areas (See Appendix I). For example, a large portion of international freshmen students have indicated as their major a field of engineering. Therefore, a cloze test was constructed from a representative textbook in the field of engineering.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

There are two primary reasons for a review of related literature. The first reason is to identify what research has and has not been conducted on a problem and the second reason is to explain the theoretical base of a problem (Kerlinger, 1973).

An extensive review of the literature failed to reveal a study concerning the reading ability of international students with reference to admission policies and success in course work at an institution of higher education. However, studies in related areas do merit consideration and are reviewed.

The review of related literature examines six areas which are listed as interdependent parts of the research study.

Part I reviews the literature for textbooks and consists of: the importance of the textbook, use of textbooks, and the limitations of textbooks.

Part II reviews the literature for readability formulas and consists of: reliability, validity, limitations, selection of Dale-Chall Readability Formula, and its limitations.

Part III reviews the literature for the cloze procedure and consists of: construction of the cloze test, scoring, and studies using the cloze procedure.

Part IV reviews the literature from the Nelson-Denny Reading Test and consists of: its purpose, reliability, and validity.

Part V reviews the literature for the Test of English as a Foreign Language (TOEFL) and consists of: description of the test, construction, use of TOEFL, reliability, and validity.

Part VI reviews the literature of studies involving the readability of textbooks and the reading ability of students who use them.

Textbooks

Textbooks, be they good or bad, interesting or boring, effective or ineffective, have traditionally been the most important tool in education (Cronbach, 1955; Jelinek, 1956; Lynch and Evans, 1963; Black, 1967; and Beechhold, 1971). Their importance begins in the first grade and persists through graduate school. Even institutions turning toward new curricula and methods depend on printed materials as much as traditional schools do (Cronbach, 1955).

The importance of the textbook in our institutions of education accounts for its extensive use and the various practices and procedures of those who use them. The textbook serves as the basic and perhaps singular source of information for many content classrooms, and the undifferentiated, unguided assignment of chapters is a quite common practice for using these textbooks. Generally, such a practice assumes that students can learn effectively the necessary and significant concepts and processes of a content area simply by reading independently in the textbook or similar technical sources. There are at least three questionable dependent conditions which are assumed by the textbook mastery concept. One is that the textbook presents all or much of the currently

essential, needed information pertinent to the course or unit objectives and that this information is valid today and will be tomorrow. Another is that absorption of information, even vital and appropriate information, through nondirected reading will produce the learning, thinking, and application behaviors which should be a part of content course learning.

It is obvious, then, that textbooks must be carefully considered because, as noted, some instructors rely heavily upon them, and turn to them for guidance (this may be especially true of courses taught by graduate assistants). As Koops (1975) points out, "Inertia, economic considerations, and inadequate teacher preparation encourage many teachers to follow textbooks unquestioningly." Thus textbooks become the course, and they determine objectives and theoretical assumptions because nearly all texts are based upon some learning theory. In fact, some textbooks present an entire teaching method for the teaching of their content.

However, we are concerned here with a prior third issue: Can most members of a typical content area class satisfactorily understand the important meanings presented in a typical general textbook assignment?

A number of factors contribute to a lack of success in textbook reading (Weintraub, 1967). One is that textbook writing is not very readable even for better readers (Beard, 1967). A second is that textbooks carry a heavy concept density per page, owing to their prevailing tendency toward encyclopedic summary. A third is that students, even those who are adequate general readers, do not know how to read a textbook selectively and flexibly in order to organize the significant data presented for learning, retention, and application. A fourth factor is that many students often do not even make a serious attempt to study

the textbook--because of attitudes toward the subject, past negative experiences with textbook reading, or reaction to extensive and unclear assignments (Hill, 1967).

Textbooks are the single most important teaching tool in American education today. Next to the instructor, the textbook probably exerts the greater influence upon school curricula than any other factor. For now and the forseeable future, textbooks will continue to be foundations of most educational programs. To an overwhelming extent, they will determine what is taught, when it is taught, and often, how it is taught (Herber, 1978).

Due to the important role textbooks play in our colleges and universities, it is crucial that instructors choose textbooks that correspond to the reading ability of their students. One way to determine if a text is suitable to a class is through the use of a readability formula.

Readability Formulas

A readability formula is a "method of measurement intended as a predictive device that will provide quantitative objective estimates of the style difficulty of writing" (Klare, 1963), "usually through some weighted combination of the measurement of language elements" (Dale and Chall, 1948). Before teachers rely on such predictive devices for assistance in selecting textbooks, consideration must be directed to several general characteristics of such formulas: for example, reliability, validity, and their limitations; and relative to this study: the Dale-Chall Readability Formula, and its limitations.

Reliability

Reliability is a measuring instrument's precision, dependability, predictability, consistency, and stability (Kerlinger, 1973). When utilizing readability formulas, instructors must consider the reliability of such formulas by answering the following questions: (1) Will the samples which are measured represent the entire piece of writing with maximum accuracy? and (2) Will two or more measurements of the same sample agree closely, even if conducted by different people? (Klare, 1963).

Lively and Pressey (1923) established the precedent of sampling when utilizing readability formulas. Sampling reliability affects readability scores, so the optimum sample size must be selected for use in a particular study. Large samples offer no assurance of reducing sampling error, but a larger random sample usually results in less sampling error than a smaller random sample (Lehmann and Mehrens, 1971). Sample size usually should be larger when (1) the number of different words or percentage of words in a given category is utilized, (2) the measurement must be highly accurate, and (3) sufficient time is available for conducting the measurement (Klare, 1963).

A certain degree of human error is probably unavoidable when applying readability formulas. If formulas are considered to have an analyst reliability, the same person must agree, on a second count, with the original count and/or another person must agree with the original count (Klare, 1963).

Validity

Validity is the success which a measuring instrument has in measuring what the measuring instrument is supposed to measure (Kerlinger, 1973). When utilizing readability formulas, teachers must consider the validity of such formulas by answering the following question: Will the results of formulas actually predict readability? (Klare, 1963).

Three types of validity are important in predicting readability: (1) the degree to which formulas predict the original criterion scores used in developing the formulas, (2) the degree to which different formulas agree with each other, and (3) the degree to which different formulas agree with outside criteria such as reading comprehension (Klare, 1963).

Correlation is the statistical test used most frequently to explore the relationship between readability formulas and the accuracy of such formulas in predicting reading levels of passages used in the development of the formulas (Klare, 1963). Most readability formulas have a correlation coefficient of approximately .70. A correlation coefficient of .70 indicates that such formulas account for about fifty percent of the variability in the passages used in the development of the formulas and that such formulas predict reading levels accurately to within approximately one grade level of actual reading levels (Klare, 1963). Reading comprehension is the original criterion used in the development of most readability formulas and is usually measured by the McCall-Crabb's Standard Test Lessons in Reading. The set of graded reading passages has become the most popular and satisfactory criterion available for use in constructing readability formulas (Klare, 1963). Readability formulas are constructed to predict the average grade level of a student who answers correctly a certain percentage of test questions about these passages (Flesch, 1948).

Limitations

Given the fact that readability formulas are reliable and valid, instructors must recognize that such formulas do not produce absolute results; rather, readability formulas are probability statements (Blair, 1971); that is, they cannot

be used to set optimal standards since they afford only a valid estimate of relative difficulty (Chall, 1956). Teachers should utilize such formulas in conjunction with other textbook selection criteria. One recommended textbook evaluation plan consists of six steps:

(1) Observe the format.

(2) Note the literary form.

(3) Read the book slowly for content.

(4) Observe the author's style.

(5) Predict the difficulty of the book by taking sample passages, analyzing them for significant elements, and applying a formula of prediction.

(6) Bring together all the facts about the book, relate them to all the facts known about the reader to determine whether the book is suited to his interests, abilities, and purpose (Harris, 1948). Such an evaluation plan precludes textbook selection based solely on readability formulas.

Readability formulas are criticized most often because such formulas do not measure contextual difficulty, abstractness and density of ideas, student interest in a subject, organization, size of type, length of line, spacing, kind of ink and paper (Blair, 1971), student health, religion, ethnic background, or what the student had for breakfast (Tibbetts, 1973), all of which can affect student's ability on readability measures. Although readability formulas are not perfect, such formulas do serve a useful purpose. That is,

> ...without some reliable measure of difficulty those who need to be able to match reader ability and difficulty level can rely on judgment. Trained judgment can be good, but there is general agreement that, even with its limitations, a good formula can be better (Martin, 1962).

Instructors must remember that:

(1) Formulas measure only one aspect of writing--style.

(2) Formulas measure only one aspect of style--difficulty.

(3) Formulas do not even measure difficulty perfectly.

(4) Formulas are not measures of good style.

(Klare, 1963)

It is impractical to continually test students' reading levels, but educational levels, which are usually related to reading levels and intellectual levels, are available as estimates of reading levels. When instructors understand the limitations of readability formulas and use such formulas to provide "quantitative, objective estimates of difficulty for pieces of writing without requiring readers to take tests of any kind on them" (Klare, 1963), readability formulas are available as estimates of textbook difficulty. Instructors who utilize both types of information in textbook selection effectively match the difficulty level of textbooks and the reading ability of students.

Selection of Formula: Dale-Chall Readability Formula

The Flesch Reading Ease, Dale-Chall, and Lorge readability formulas are probably used more often than any other formulas at high school, adult, and college levels (Kingston and Weaver, 1967; and Michaelis and Tyler, 1951). Each of these formulas was based on the McCall-Crabb's Standard Test Lessons in Reading, but instructors probably should select either the Flesch Reading Ease or Dale-Chall formula when accuracy is more important than ease of computation (Powers, Sumner and Kearl, 1958).

The Dale-Chall Readability Formula is considered one of the more precise of the formulas available for upper-grade and adult level materials, in fact,

almost all of the new readability formulas have been measured against the Dale-Chall formula as a standard (Burkhead and Ulferts, 1977). The formula was published in 1948, and recalculated for greater accuracy in 1958 (Powers et. al., 1958). Because of the cross-validation work of Lee and Belden (1966) and that of Miller (1974), investigators may now use the Dale-Chall formula with even more confidence than before, since both of these studies failed to nullify the validity of the Dale-Chall Readability Formula (Burkhead, 1975). To facilitate determination of the Dale-Chall readability scores, Koenke (1971) published a graphic computation method in 1971, and Williams (1972) recently has developed a table for rapid determination of revised Dale-Chall scores.

The Dale-Chall utilizes a number of specific rules but is based on just two counts: (1) average sentence length, and (2) percentage of unfamiliar words (i.e., those not appearing on the Dale List of 3,000 words) plus a constant (3.6365). However, the application of the Dale-Chall formula is extremely time consuming. It requires that a sample of one-hundred words be taken every ten pages, each word be compared to the Dale 3,000 word list, and the unfamiliar words be counted. Then, computation must be made to determine the average sentence length and the percentage of words outside the Dale list. These figures are then applied in the formula: $Xc = .1579X_1 + .0496X_2 + 3.6365$, where X_1 is the relative number of words outside the Dale list and X_2 is the average sentence length (Dale and Chall, 1948).

Word List and Limitations

The Dale-Chall formula produces the smallest error and the highest prediction power of all readability formulas. The Dale-Chall also requires utilization of a word list (Dale List) of approximately 3,000 words (Martin, 1962).

This Dale List was constructed by testing fourth graders on their knowledge in reading of a list of approximately 10,000 words. This larger list included the most common words in the Thorndike (1931), Buckingham and Dolch (1936), and other word lists. An attempt was made to include all words that fourth graders would possibly know. A word was considered as known when at least 80 percent of fourth graders checked it as known.

Some caution should be used when applying the Dale List. Simply because a word appears on a list does not assure that its particular meaning in a given context will be understood by the reader. Neither do readability formulas consider the concept load or interest of the materials, two factors that often affect the difficulty of material.

Application of the Dale-Chall Readability Formula

For details of its application see Appendix A.

Another method used to determine if a textbook is suitable to a class of students is via the cloze procedure.

Cloze Test

An efficient approach to material-referenced reading assessment is to convert representative passages from the material under concern to the cloze testing format as developed by Taylor (1953). The usual procedure for doing this is to select a 250 word passage and to substitute an underlined blank of ten spaces for every fifth word, producing a fifty-item test. The students' task is to fill in the missing word. Only responses identical to the deleted words (no synonyms) are accepted as correct.

At the heart of the procedure is a functional unit of measurement tentatively dubbed a "cloze". It is derived from "closure", a term in gestalt

psychology referring to the human tendency to complete a familiar but not quite finished pattern. An example of this principle as it applies to language, is "Chickens cackle and _____ quack." The obvious answer is "ducks". If the word placed in the blank is the same as the one omitted, the person scores one cloze unit for correctly closing the gap in the language pattern (Taylor, 1953).

In a cloze readability test, only one word is deleted at a time. The word deleted may be a structural word (structural words consist of classes such as articles, prepositions, conjunctions, modals and auxiliary verbs, and so on). The cloze is made only from the sentences in the text. The students who are taking the test have not read the undeleted version of the passage.

The student has 80 percent of the text on which to base his responses, so his responses very much depend on his ability to understand the text. Also, the fact that he has not read the original text may require that he uses processes similar to those required to answer questions made from derived sentences plus a sensitivity to the author's style and the tone of the passage (Bormuth, 1968).

Since the introduction of the cloze procedure as a means of measuring readability, uncertainty has persisted over how best to score results. The preferred method has been to accept verbatim responses only, with no allowance for synonymous answers or for "stylistic" deviations. The principal justification for this policy has been ease in scoring. Permitting synonyms and other sensible responses involves the often difficult distinction between what should be counted and what should not (McKenna, 1976).

The central issue is whether accepting alternative responses promises benefits not available through verbatim scoring. Research to date has treated

this question only peripherally. Studies indicate, for example, that for subjects in the process of acquiring English as a second language, the synonymic score is virtually the same as the verbatim score (Anderson, 1972), for the ability required to produce an exact answer does not vary greatly from that required to produce a synonym. Interestingly, similar results have been found (Miller and Coleman, 1967) when not only synonyms but any response of the same "word class" as the original is counted correct. Hence, it appears that for ordinary use with normal subjects the verbatim method of scoring is virtually as valid as synonymic and even more permissive methods, not to mention its greater simplicity (Bartoo, 1975).

Cloze reading test scores tend to correlate in a moderately high positive manner with scores on standardized reading tests, multiple choice test scores over the same passage, readability formula results, and informal reading inventory results (Bormuth, 1968; Rankin and Culhane, 1969; and O'Brien, 1973).

Limitations

As effective as the cloze procedure is, it does have its limitations. First, deleted content words (nouns, main verbs, and adjectives) may be more difficult to produce as cloze items than structure words, thus affecting the test results (Hittleman, 1973). Second, Jefferson (1969) concluded that although the cloze was a strong research tool, it was not a highly valid measure of reading comprehension.

Nelson-Denny Reading Test

One widely used instrument in reading evaluation for students and programs at the college level is the Nelson-Denny Reading Test. The

Nelson-Denny is used throughout the country in high schools and colleges, and several factors make it quite popular. It is easy and quick to administer (thirty-five minute total test time), and it can be scored rapidly by machine or by hand. The test booklets are also reusable since answer sheets are available (Clary, 1973).

The Nelson-Denny is also popular because of its predictive, screening, and broadly diagnostic purposes. For screening and for predictions of academic success, the total score is most useful. For diagnosing individual problems, strengths, and weaknesses, the subtest scores in vocabulary and comprehension are most useful (Harris and Sipay, 1976).

Studies have indicated that the Nelson-Denny is a good predictor of college reading ability in general and content reading (Levin, 1976). Although many research studies have used the Nelson-Denny, little research has actually been done on the validity and reliability of the test. One, often cited study, was conducted by Orr (1965). In this study, Orr found that the tests of vocabulary and rate are quite reliable (.92 - .93), but the comprehension reliability is lower (.81).

Test of English as a Foreign Language

Competence in the English language is one factor which has been assumed to be crucial for the success of international students studying at an American university. It is difficult to imagine how a student can learn in an American institution without being able to read, write, and comprehend in the English language. Thus, English proficiency might be thought of as a necessary, although

not sufficient, prerequisite for college success. For this reason many universities recommend or require that their international applicants take the Test of English as a Foreign Language, (TOEFL) (Sharon, 1972).

The TOEFL is intended to measure the English proficiency of international students applying for college admission in the United States. As such, it consists of items and item types addressed to the linguistic problems of non-native speakers of English, and it is designed to assess the degree of facility with those nuances of English that seem to cause international students difficulties in pursuing college studies.

The TOEFL was originally a two-hundred question test consisting of five sections: Listening Comprehension, English Structure, Vocabulary, Reading Comprehension, and Writing Ability. However, as a result of extensive research studies (Pike, 1974), a three-section test was developed and introduced into the International Testing Program on an operational basis in September 1976.

Each form of the current test consists of four-choice questions distributed among three separately timed sections: Listening Comprehension, Structure and Written Expression, and Reading Comprehension and Vocabulary. All responses are gridded on answer sheets that are machine-scored at ETS in Princeton. Applicants are allowed about two hours to complete the test. However, about three hours are required for a test administration because of the time needed to admit applicants to the testing room, to allow applicants to enter essential information on their answer sheets, and to distribute and collect the test materials.

The material for the test is written by specialists in the teaching of English as a foreign language who are given rigorous training in writing questions for the test before undertaking actual writing assignments. Additional material is prepared by members of the TOEFL Committee of Examiners and by ETS test specialists. All questions are reviewed for cultural bias, content appropriateness, and so forth, and are tried with selected groups of international students. Only after the reviews and the results of the tried questions have been analyzed are questions selected for the final tests. Then, following the administration of each new form of the test, a statistical analysis of the responses to each question is performed. Whenever the results indicate that a question has not functioned as expected, test specialists review it again (ETS Bulletin, 1977).

TOEFL Score Reports

The current TOEFL score reports show the score on each of the three sections of the test and the total score. The scores for the three sections of TOEFL are based on the number of questions answered correctly. No penalty is subtracted for wrong answers. Scores for the three sections are reported on a scale ranging from 20 to 80. The total score, which can range from 200 to 800, is derived by adding the three section scores and multiplying that sum by three and one-third.

Reliability

The reliability of a test is the extent to which it yields consistent results. The average reliabilities of the three sections and the total test for the six forms

administered between September 1976 and May 1977 were computed using the Kuder-Richardson Formula. For Section I (Listening Comprehension), the reliabilities for the six forms ranged from .89 to .92. For Section II (Structure and Written Expression), the shortest of the sections, the reliabilities ranged from .83 to .88. The range for Section III (Reading Comprehension and Vocabulary), is .89 to .92 and, for the total test, the reliabilities ranged from .95 to .96.

The standard error of measurement is an estimate of the probable extent of the error inherent in a test score due to the imperfect reliability of the test. The standard errors of measurement for Sections I and III are about 2.5 points; for Section II, about 3.2 points; and for the total score, about 16 points.

In comparing total scores for two applicants, one should not conclude that one score represents a higher level of proficiency in English than the other unless there is a difference of at least 32 points between them.

Validity

Since the contruction of the TOEFL in 1963, several studies have been conducted to determine the validity of this instrument to measure the English proficiency of international students applying to American colleges. Evidence of its validity as a test of English proficiency is given by its correlation with overall teachers' ratings and with other tests of English proficiency (American Language Institute at Georgetown, 1966; Educational Testing Service, 1965, 1966; Maxwell, 1965; and Upshur, 1966), its correlations with theme ratings (Pitcher and Ra, 1967), and its correlations with college grade point average (Chalmers, 1964; Domino, 1966; Maxwell, 1965; and University of Washington, 1966).

In seven current validity studies completed in the United States between 1965 and 1968, the correlations (Pearson r) between TOEFL and various tests, including the American Language Institute of Proficiency, the cloze test, and tests developed at various universities, varied between .79 and .89. When TOEFL scores were compared with teachers' ratings, scores on written themes, or judgments of students' ability to pursue regular academic courses, the Pearson r ranged from .73 to .79 (Gue and Holdaway, 1973). Also implicit in the design of the test is the hypothesis that, while TOEFL may differentiate adequately among international students and may identify their English language difficulties accurately, it will not accomplish these purposes for students who are native speakers of English (Angoff and Sharon, 1970; and Clark, 1977). The results of these studies have shown explicitly that the TOEFL is a valid measure of English proficiency for international students.

Readability and Reading Ability

A number of studies have been made comparing the reading ability of college students with the readability of their textbooks. Most studies have generally found that there are huge discrepancies between the reading ability of college students and the readability levels of their texts. This is quite a serious problem as most courses rely quite heavily upon assigned textbook materials. If the students are having difficulties with the readings, they will most likely have trouble obtaining high grades in their courses or even passing their courses. Additionally, constant efforts by a student to read material which is significantly above his reading level might lead to frustration, anger, resentment, and the like, feelings which are certainly not conducive to successful academic

achievement nor continued college attendance. Thus huge discrepancies between student reading ability and textbook readability probably exerts a tremendous impact upon attrition rates.

One such study by Major and Collette (1961) on the difference between student reading ability and textbook reading levels, found in a nationwide survey of college general biology textbooks, that the most frequently used and preferred (by the faculty) texts were written beyond the reading comprehension level of college freshmen.

In addition to reading levels of textbooks, one must consider the reading ability of students who are required to read them. For example, the average reading level of college freshmen has often been shown to be below grade level 13.0. However, the mean reading level is not indicative of the true seriousness of the problem as further inspection will usually reveal an extended range of reading level scores. Martin (1967), for instance, obtained a mean reading level of 12.6 for freshmen at New York City Community College. However, individual scores on the Nelson-Denny (Form A) ranged from the first percentile to the ninety-ninth percentile. While 43.6 percent of the students were reading at grade level 13.0 or above, 25 percent were reading at grade level 11.0 or below (with 19 percent of them at grade level 10.5 or below). Thus, college instructors, in assigning textbooks, must be cognizant of the fact that many of their students are reading considerably below grade level.

How well have instructors of higher education reacted to the fact that many of their students are reading below grade level? Judging from the available research, the answer is "not very well at all". The discovery of substantial discrepancies between the reading level of students and the readability levels of their texts has been found to be the norm.

Other, more recent studies, have shown this trend of discrepancies between the reading level of college students and the readability level of their textbooks:

Creamer (1968) found that while the students in a rural community college had an average reading ability on the eighth grade level, the textbooks they were using averaged between grade levels fourteen and sixteen.

Burford (1970) compared the reading ability (Cooperative English Test: Reading Comprehension, Form A) of freshmen in 21 sections of the Earth Science 141 course at East Texas State University with the readability (Dale-Chall) of their earth science textbooks. The reading abilities of the students were found to range from the eighth grade level to the college graduate level, with the mean falling at the thirteenth grade level. In comparison, a majority of the samples of reading material taken from the texts were rated at the twelfth and thirteenth to fifteenth levels. This was above the reading level of 38 percent of the students.

McClellan (1970) compared reading levels (Nelson-Denny) of 359 Hillsborough Junior College students in four Social Science area classes and one English class with readability levels of twenty selected texts, found that: (1) Less than 30 percent of students enrolled in the college would be able to read their texts. (2) Of the twenty texts analyzed, eight had readability levels of 16.0+. Of these eight texts, three were selected for use by students in remedial type courses. (3) The range of students' reading ability was:

a. 30.2 percent were reading at 13.0 grade level or above.

b. 33.5 percent were reading at 10.0, 11.0, or 12.0 grade level.

c. 32.1 percent were reading at 7.0, 8.0, or 9.0 grade level.

d. 4.2 percent were reading below 7.0 grade level.

Gibson (1971) reported that Nelson-Denny test scores of a sample of 200 California community college students indicated that 65 percent had poor reading ability, 24 percent average, and 11 percent superior, with informal reading inventory results indicating that over half were reading at frustration level.

Hagstrom (1971), in one study, compared the reading level of 359 junior college students (as determined by the Diagnostic Reading Tests, Higher Level) with the readability of their textbooks (Dale-Chall). Of the twenty-nine textbooks he evaluated for sixteen different classes, almost half of them (14) "proved to be inappropriate for learners if we say that a text should not be more than one grade level above the reading ability of the students who use it."

Cline (1972) made a study comparing the readability of textbooks and the reading ability of freshmen students (as determined by the Nelson-Denny and the Dale-Chall) at a Missouri community college. He found that of the seventeen textbooks analyzed, eleven were above the reading ability of at least 50 percent of the students in those classes, whereas seven were above the reading ability of at least 75 percent of the students. The average reading level of the students involved, was found to be at the 12.6 grade level (as determined by the Nelson-Denny). In all, Cline found that 52 percent of the students in all of the classes had reading abilities below the grade level placement of the textbooks. He concluded that, "Thus, even though the students had an average reading ability probably higher than that for most community colleges, their textbooks were in most cases much too difficult for them to handle."

In another study, Hagstrom (1974) compared the reading level of students (Diagnostic Reading Test, Higher Level) in five different occupational courses

with the readability levels of their textbooks (Dale-Chall). Of the twelve texts evaluated, he found that nine proved to be inappropriate for learning on the basis that a text should not exceed the reading ability of the student by more than one grade level.

Kurzman (1974) compared the reading ability of eighty-one students taking Social Science courses at a senior college in the Bronx, New York, with the readability levels (SMOG Readability Formula) of twenty-three of their Social Science textbooks. The average reading level of the students, as determined by the Nelson-Denny, was 10.4. The average readability levels of the texts (comprised of evaluation from the SMOG, from two reading teachers, and from the Social Science teachers whose books were being used) showed a range of from grade 13 through grade 17. Four of the texts were on the thirteenth grade level, seven were on the fourteenth grade level, five were on the fifteenth grade level, six were on the sixteenth grade level, and two were on the seventeenth grade level. Kurzman stated that:

> This study shows that Social Science textbooks used by a group of college freshmen were in most cases many grade levels above their reading ability. For use in self-study, which is one of the main objectives of a college education, the textbooks were found to be too difficult for many of the students to comprehend adequately or properly.

The results of these studies dramatically demonstrate the vast discrepancies between student reading ability and textbook readability at the college level. It appears that although the average reading level of college students lies within the 12.0 to 13.0 grade level range, the average college textbook is written at a reading level range of 14.0 to 16.0 grade. These grade

levels indicate, at best, that the average college textbook is approximately one grade level above the average college students' reading level. Thus, many college students who speak English as their native language would find most of their textbooks difficult at best; but, for those students who speak English as a second language, the task of reading their college textbooks would be ominous.

CHAPTER III

METHODOLOGY

Introduction

A descriptive research design was employed as a means of analyzing the problem under investigation. The problem was: to determine to what degree entering international undergraduate freshmen students are able to read their textbooks and what implications this may have as to international students seeking admission to a Southwestern state university.

The study was designed to provide answers to the following questions:

1. To what extent are international students, seeking enrollment at a Southwestern state university, able to read general textbooks and those of their designated majors (as determined by cloze tests and the professional judgment of a panel of reading experts)?

2. In predicting the general and content reading ability of entering international freshmen, which of the tests used (TOEFL, Nelson-Denny Reading Test, or tests using the cloze procedure) is the most valid instrument when compared to a reading grade level determined by the professional judgment of a panel of reading experts?

Previous portions of the investigation explained the specific problem of the study and reviewed the related literature pertinent to the topic of concern. The purpose of this chapter is to explain in detail the methods and procedures of

the present investigation. Following sections describe the method of selecting subjects, test instruments used in the study, method of collecting the data, selection of statistical tests, and analysis of the data.

Population

The international student population is generally older than the average student in an introductory freshman course. According to Clapper (1976) this is generally due to the unwillingness of international students to take such required courses when first arriving in this country. Instead, they prefer to postpone such requirements until their junior or senior year when they would be more familiar with American life and more confident of their language ability.

The Southwestern state university at which this study takes place has an international student population of approximately 1,800, coming from 73 different countries, and representing nearly all degree major areas on campus (See Appendix I). The highest percentage of international students major in the fields of Engineering and Business.

The admission policy for international students desiring to enter the Southwestern state university where this study was conducted is found in Appendix C. Simply stated, each international candidate for admission to the university must show documented proof of:

1. High scholastic achievement from a recognized secondary school.
2. An adequate command of the English language.
3. Ability to finance his education.

Sample

The sample consists of international students applying or who are currently enrolled at this Southwestern state university. These students have had between four and six years of English instruction in their respective countries, and have not been in the United States or any other English speaking country for more than eight months. Students have been administered the Test of English as a Foreign Language (TOEFL) and only initial TOEFL test scores were used for those students who have taken the TOEFL more than once. In addition, students must have taken the initial TOEFL examination during one of the scheduled examination times between 1979 and 1980.

A list of international students who met the sample requirements was compiled by the ELS Language Center of Norman and the University of Oklahoma International Office. The sample was further limited to those international students who chose a major in one of the fields of Engineering and a Non-Science related major (such as Humanities, Journalism, etc.) and who had not already taken the general core course Political Science 1113. Students on the list were grouped into five ability levels according to their TOEFL score ranges (See Table 1). Each student was assigned a random number. By use of another random chart (Rand Corporation, 1955) students were selected for use in the research study. Fourteen students were randomly selected from each of the five groups making a total sample size of 70 international freshmen students.

Description of the Test Instruments

Test of English as a Foreign Language (TOEFL)

The TOEFL is a three hour timed, objective test of English proficiency, designed for international students whose native language is not English, but

TABLE 1

Student Ability Level Ranges on the

Test of English as a Foreign Language

TOEFL Total Scores	Number of Students
400 - 449	14
450 - 499	14
500 - 549	14
550 - 599	14
600 - 649	14

According to Testing Service's TOEFL Workbook (1980) these score ranges incorporated from the 9th percentile to the 98th percentile of students Total scores on the TOEFL.

who are applying to institutions of higher education in which English is the language of instruction. The test is divided into three parts or subtests:

(1) Listening Comprehension - Candidates are asked to respond to questions based on a recording of short statements, short questions, short conversation, and a simulated lecture.

(2) Structure and Written Expression - Part I, English Structure, consists of short, written, incomplete conversations between two speakers. Candidates select the correct completion from four possible choices; Part II, Written Expression, has two parts. In Part A, a sentence is presented with four words or phrases underlined. Candidates are asked to identify the one underlined word or phrase which would not be accepted in formal English. In Part B, candidates are

to choose from among four words or phrases, that word or phrase which best completes a given sentence.

(3) Reading Comprehension and Vocabulary - Part I, Reading Comprehension, consists of a series of paragraphs to be read silently. The candidate then chooses, from among four possible answers, the one best answer to each of a series of questions on the paragraphs. Part II, Vocabulary, consists of two parts. In Part A, a series of sentences is prescribed, from which one word is omitted from among four possible choices candidates must choose the one word which best completes the sentence. In Part B, candidates select from a list of four words that one word whose meaning is closest to that of a given word or phrase (Gue and Holdaway, 1973; and Educational Testing Service, 1978).

Scoring of candidates' tests is performed by the Educational Testing Service (ETS). The E.T.S. also makes admission recommendations relative to the TOEFL scores (Appendix B) and gives guidelines for using the TOEFL scores (Appendix B).

Dale-Chall Readability Formula

The Dale-Chall Readability Formula was used in this study to determine the readability levels of the general and content area materials and textbooks used by international students included in this study. The Dale-Chall was selected for use in this study because of its reputation as the most accurate readability formula available for upper-grade and adult level materials (Burkhead and Ulferts, 1977).

The Dale-Chall uses complicated procedures involving mathematical computations and the use of constants in deriving its grade level ranges. The

two key factors of the formula are sentence length and vocabulary difficulty. Sentence length is determined by the number of words per sentence in a 100 word passage. Vocabulary difficulty is determined by first presenting a set vocabulary of 3,000 words, then declaring that any word not on this list is "unfamiliar". It is the percentage of "unfamiliar" words which determines the difficulty level of the passage in grade ranges from fourth to sixteenth.

In applying the Dale-Chall, the standard procedure consists of selecting a sample of 100 words from every tenth page of those books to be analyzed. This basic procedure has been altered for this study based on the research findings of Martin and Lee (1961) and Burkhead and Ulferts (1977). The following is the rationale for this procedural change:

Due to the time consuming nature of the Dale-Chall, many researchers and educators are reluctant to use it. To combat this inherent weakness of the Dale-Chall formula, Burkhead and Ulferts (1977) studied 48 introductory college management textbooks to determine whether the same results on the Dale-Chall, using every tenth page, could be obtained with fewer samples. A similar study was conducted by Martin and Lee (1961) using five high school biology textbooks. In their study no significant difference between the means obtained when using samples from ten page intervals and those obtained when using samples selected from fifty page intervals.

In the Burkhead and Ulferts (1977) study a sample of 10, 20, 30, 40, and 50 pages were taken from each textbook. Results from their research showed that the fifty page interval samples yielded as dependable Dale-Chall scores as those taken at ten page intervals.

The revised procedure in selecting samples at fifty page intervals per text was used.

For detailed description of the application and scoring of the Dale-Chall Readability Formula see Appendix A.

Cloze Test

The cloze test consists of a set of reading passages in which every n^{th} word is deleted, and replaced by a blank (of uniform length). Subjects replace the missing words with a single word appropriate to the context. Only those responses identical to the deleted words (not synonyms) are accepted as correct.

Construction of the Test

Step 1: Select a reading passage of at least 275 words (55 cloze blanks) from the portion of the book being used for instruction.

Step 2: Delete every fifth word.

Step 3: Type up the cloze test, allowing ten spaces for every deleted word.

Administering and Scoring

Step 1: Hand a test to each student and ask him to write in the blank spaces the words he thinks should be there. Do not provide a time limit, as this is a power test.

Step 2: When the tests are completed, mark every word that is not exactly the same as the word from the sample. Total up the number of correct responses (unmarked).

Step 3: Determine the difficulty level of each student's test results on the following scale (established by Rankin and Culhane, 1969):

> Independent Level - the student correctly replaces 61 percent or more of the deleted words.

Instructional Level - the student correctly replaces 40 percent or more of the deleted words.

Frustration Level - the student correctly replaces 39 percent or less of the deleted words.

The cloze tests administered to the international students of this study are located in Appendix D along with a more complete explanation of the construction of the cloze tests used in this study.

Nelson-Denny Reading Test

The Nelson-Denny Reading Test is perhaps the most popular measure of college students' reading ability, providing information for evaluating student efficiency. The test gives a three-dimensional view of reading ability by measuring vocabulary development, reading comprehension, and reading rate.

The Nelson-Denny is a thirty minute, timed, assessment designed for grades nine to sixteen to provide a useful measure of reading ability, in terms of vocabulary and comprehension. The test contains 100 questions to measure vocabulary (ten minute time limit) and 36 questions (eight reading selections for which twenty minutes is allowed) to measure reading comprehension. The comprehension score is given double weight in arriving at a total score, the best single index of reading ability obtained through the use of this instrument. Then the scores are added to yield a total score. Each dimension can be translated into a grade level.

Administering the Test

Each student is given a soft lead pencil, an answer sheet, and a Nelson-Denny Reading Test, Form A. Specific directions are then read to the students from the Nelson-Denny Test Manual. The first subtest, Vocabulary, permits a ten minute working time. Students work diligently until the examiner calls

"STOP". The second subtest, Reading Rate and Comprehension, is then administered. Again, directions are read by the examiner and a called "STOP" occurs after twenty minutes. After the approximately fifty minute administration time, the researcher (examiner) collects the test material and hand scores the results. Individual students' grade equivalent scores for each subtest and total score are derived from the Nelson-Denny Grade Equivalent Norm Table in the test manual.

Interpreting Test Results (Nelson and Denny, 1965)

The Nelson-Denny Reading Test yields four test scores: Vocabulary, Reading Comprehension, Reading Rate, and Total.

Vocabulary - If a student's lowest score is on this subtest then the student should concentrate on building his vocabulary.

Comprehension - A student with the lowest score in comprehension suggests reading habits that hinder the full use of his vocabulary.

Rate - If a student's rate is the lowest score, then his vocabulary, comprehension, and total scores are probably underestimates of his real ability. A low rate score may indicate such faults as vocalizing, regressing, and word-for-word reading.

Although a reading rate measure is included in the test design, this measure was deleted from the test administration and scoring due to its irrelevance to the nature of the research.

Panel of Reading Experts

The panel of reading experts consisted of four Reading Specialists who were to determine the sample of students' general and content reading ability.

Two of the panel members were from the ELS Language Center of Norman and had worked with international students in reading and language labs for more than three years. The other two members of the panel were doctoral students in the field of Reading and had between one and two years of experience working with college students in the reading labs at the University of Oklahoma.

To establish reliability in professional judgment, the panel was presented with three samples of students' informal test results to evaluate and make a grade equivalent placement as to the student's general and content reading ability. For information of the training and duties of the panel of reading experts, see Appendix F.

Using the procedures in Appendix F, each member of the panel was required to review three actual samples of informal tests and test results (administered by the researcher) of three international students who met the sample requirements. Each sample included:

1. Six Informal Reading Inventories, whose grade equivalent levels were determined by the Fry (1968) and Flesch (1948) Readability Formulas, from general and content reading material with student responses to comprehension questions.

2. Six Informal Reading Inventories, whose grade equivalent levels were determined by the Dale-Chall Readability Formula, from general and content reading material with student responses to comprehension questions.

Based on these informal test results, each panel member determined the international student's reading ability to the nearest grade level.

After each panel member made a professional judgment concerning the reading ability level of the three case studies, a pairwise comparison was

calculated to determine how reliably these reading experts scored each student. The results of the panel's reliability exercise were as follows: In summary the results of the panel's reliability exercise indicated that as a group, the panel of reading experts were very reliable in determining the general reading ability ($\bar{r}$ = .9965) and the content reading ability ($\bar{r}$ = .984) of the three entering freshmen international student case studies. In addition, results indicated that there were no significant differences ($\bar{r}$ = .905) found between the variances in judges overall estimations of these international students general and content reading abilities. For more detailed information see Appendix F.

Determining Reading Ability Levels

The panel of reading experts evaluated students by:

1. Finding the approximate grade level range of students' reading ability by use of Informal Reading Inventories. The readability of these passages was determined by the Fry and Flesch Readability Formulas.

2. Once the approximate grade level range was found, a passage applying a more precise readability formula was used (Dale-Chall Readability Formula) to determine an accurate reading level of students.

3. To determine students' grade level of reading ability to the nearest grade, professional judgment was utilized, based on the students' comprehension performance.

Textbooks Used in the Study

As in many universities there are minimal requirements for graduation. To earn a degree there are specified number of courses that must be taken or whose

requirements must be satisfied. One such course is the standard introduction to Political Science. Under normal circumstances the international student will take this course as he would any university requirement.

The textbooks used in this course (see Appendix E) have an average readability of 11-12 grade level (as determined by the Dale-Chall Readability Formula). The textbook used here was chosen because it represents the upper one-third of the average readability level of those general core course textbooks analyzed. The upper one-third limit was used because it is reasonable to assume that if a student can meet this criterion then he should be able to successfully read two-thirds of his course textbooks.

In the designated content areas, several textbooks from each selected major were analyzed (see Appendix E). Again, a textbook representing the upper one-third readability level of the textbooks of that content area was used in the construction of tests using the cloze procedure. The designated majors represented in this study were Engineering and Journalism; and the textbooks selected as representative of each have an average readability of 13-15 grade level and 11-12 grade level respectively (as determined by the Dale-Chall Readability Formula).

See Appendix E for further information concerning textbooks, sampling, and Dale-Chall results.

Collecting the Data

In cooperation with ELS Language Center and the University of Oklahoma International Office, a list of prospective and freshmen international students' TOEFL Total scores was compiled. From this list students were assigned to one

of five TOEFL Total score groups and assigned a random number. By use of a random chart, fourteen qualified students were selected per group, a total of seventy students.

Upon initial contact, students were informed as to the purpose of the study and sample requirements. A short meeting was held with those students enlisted for the study. At the meeting, a list of students' designated majors was compiled, and times were set for the test sessions and initial meeting with the assigned member of the panel of reading experts.

Several test sessions were set to accommodate students. Each student signed up for one of the three test dates and times. At the test session, each student was administered (by the researcher) the Nelson-Denny Reading Test, Form A. This test is timed (administration time of fifty minutes) and follows strict standardized procedures. Upon completion of this test, students were administered a cloze test using a selected passage from the general content textbook chosen for the study, and a cloze test using a selected passage from the textbooks of their designated majors. No time limit was set and students worked at their own pace.

During the same time frame, students met with their assigned reading expert. A total of three hours per student was estimated for determination by the reading expert of a student's general and content reading ability (as determined by the professional judgment of the panel member's evaluation of students' informal test performance). Upon completion of each reading expert's assigned student load, the researcher gathered, coded, and filed all data for later analysis.

Analysis of Data

The final phase of methods and procedures was the data analysis procedures. Using the data by the procedures as described in this chapter, scores of freshmen international students on the cloze tests (General and Content), the Nelson-Denny Reading Test, Form A, the reading grade level of content and general reading ability as determined by the panel of reading experts, and the Test of English as a Foreign Language (TOEFL) were tabulated. Mean scores and standard deviations for scores on each variable were analyzed via the Statistical Package for the Social Sciences (SPSS), a computer program statistical package on the IBM 370 computer and are presented in Chapter IV.

To examine the relationship between entering freshmen international students' general reading ability (as measured by the cloze test) and the readability of their general textbooks (as determined by the Dale-Chall Readability Formula), and the TOEFL Total scores a frequency scattergram was designed.

To examine the relationship between entering freshmen international students' content reading ability (as measured by the cloze test) and the readability of their designated content area textbooks (as determined by the Dale-Chall Readability Formula), and TOEFL Total scores a frequency scattergram was designed.

To examine the relationship between entering freshmen international students' general reading ability (as determined by the professional judgment of a panel of reading experts) and scores on the Nelson-Denny Reading Test, Form A. (Subtests: Vocabulary, Comprehension and Total), cloze tests, and the five levels

of the Test of English as a Foreign Language (TOEFL), Pearson r correlations were used. If a high positive correlation (.65 to 1.0) were found between the panel of reading experts and any of the tests administered, then the test or tests could be considered a good predictor of a student's ability to read college textbooks of the required general core courses. If a negative correlation of -.65 to -1.0 were found between the panel of reading experts and any of the tests administered, then the test or tests could be considered a good predictor of the inverse degree of relationship between a student's ability to read college textbooks of the required general core courses.

To examine the relationship between entering freshmen international students' content reading ability (as measured by the professional judgment of a panel of reading experts) and those scores on the Nelson-Denny Reading Test, Form A, (subtests: Vocabulary, Comprehension and Total), cloze tests, and the five levels of the Test of English as a Foreign Language (TOEFL), Pearson r correlations were used. If a high positive correlation (.65 to 1.0) were found between the panel of reading experts and any of the tests administered, than the test or tests could be considered a good predictor of a student's ability to read college textbooks of his designated major. If a negative correlation of -.65 to -1.0 were found between the panel of reading experts and any of the tests administered, than the test or tests could be considered a good predictor of the inverse degree of relationship between a student's ability to read college textbooks of his designated major.

The SPSS (Statistical Package for the Social Sciences) subprogram Pearson Corr (Pearson product-moment correlation) was utilized to test Hypotheses 3 and 4. The Pearson product-moment correlation coefficient, symbolized by r, is a measure of association indicating the strength and direction of the linear

relationship between two variables. If the value of r is close to zero, one can assume there is little or no linear relationship between the two variables. if the value of r approaches +1.0 or -1.0, one can assume there is a strong linear relationship. In utilizing the Pearson Corr subprogram, a certain processing option was used; OPTION 3. This option causes a two-tailed test of statistical significance to be applied to each coefficient. A two-tailed test is normally used when the researcher does not have an explicit hypothesis concerning expected direction of the coefficient, i.e., whether it will be positive or negative. (Nie, et. al., 1975).

In addition to the Pearson Corr subprogram, the subprogram Condescriptive was utilized to compute descriptive statistics for continous interval-level numerical data. This subprogram includes: mean, standard error, standard deviation, variance, kurtosis, skewness, range, minimum, and maximum.

In hypothesis testing two types of errors occur. Type I errors or Alpha errors occur when the null hypothesis is rejected when it is, in fact true. The percentage of Type I errors that will be made will be equal to whatever confidence level the researcher chooses to use as a rejection level; the lower the rejection level the more Type I errors made, and the higher the confidence level the fewer Type I errors made. The second type of error, Type II or Beta errors, occurs when the null hypothesis is accepted when it is, in fact, false. "There is no way completely to avoid either (Type I or Type II) errors, and attempt to reduce the probability of one often (but not always) enhances the probability of the other" (Senter, 1969).

The researcher decided that the Type II error was the more critical error, and therefore, its probability of occurence needed to be reduced. To reduce the

occurence of Type II errors, the confidence limit was set at .10 (.10 was chosen as the level of rejection because if one assumes other things being equal the lower the rejection level, the less the probability of committing a Type II error) and a sample size (N) of 70 was used.

To examine the relationship between entering freshmen international students' general and designated content reading abilities (as measured by the panel of reading experts) a scattergram was charted. This chart shows the percentage of students competent in reading general and content textbooks at varying score ranges on the Test of English as a Foreign Language (TOEFL).

CHAPTER IV

ANALYSIS OF DATA

This chapter contains an analysis and summary of the data as they relate to each of the hypotheses under investigation. The questions this research attempted to answer were:

1. To what extent are international students, seeking enrollment at a Southwestern state university, able to read general textbooks and those of their designated majors as determined by cloze tests and by the professional judgment of a panel of reading experts?

2. In predicting the general and content reading ability of entering international freshmen, which of the tests used: TOEFL, Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), or tests using the cloze procedure, is the most valid instrument when compared to general and content reading grade levels determined by the professional judgment of a panel of reading experts?

For testing the hypotheses, the researcher accepted those which were supported at or below the .10 level of significance and resulted in a positive or negative correlation coefficient between .65 to 1.0. Data summarized in the tables constructed for the following sections of this chapter reflect the results of entering international students' test scores within the five TOEFL ranges and the total sample under study.

Results of Hypotheses Testing

Results of Testing Hypothesis 1:

Ho_1: There is no relationship between entering freshmen international students' general reading ability (as measured by the General cloze test) and the readability of their general textbooks (as determined by the Dale-Chall Readability Formula), and Total scores on the TOEFL.

Ha_1: There is a relationship between entering freshmen international students' general reading ability (as measured by the General cloze test) and the readability of their general textbooks (as determined by the Dale-Chall Readability Formula), and Total scores on the TOEFL.

Data relevant to this hypothesis are demonstrated in Graph 1 and are summarized in Tables 2-3.

The General cloze test was constructed from a passage representing the upper one-third level of reading difficulty of all those general core course textbooks analyzed. The passage selected was from a Political Science textbook and had a grade equivalent level of 11-12 according to the Dale-Chall Readability Formula. The cloze procedure employed made a test with 68 response blanks. For scoring purposes, an entering freshman international student who scored in the Independent Level (42 to 68 items correct) would be able to read general core course textbooks that lie in the upper one-third range of difficulty with minimal difficulty; those who scored in the Instructional Level (27 to 41 items correct) would have difficulty reading the upper one-half difficulty range level of those textbooks designated for general core courses; and those who scored in the Frustration Level (26 items and less correct) would have

difficulty reading more than one-half of those textbooks designated for general core courses.

The first hypothesis was tested by two methods. First a Scattergram was constructed to demonstrate the relationship between international students' test scores on a General cloze test, which represent the upper one-third reading difficulty of textbooks examined (determined by the Dale-Chall Readability Formula), and Total scores on the TOEFL.

The data presented in Graph 1 demonstrates how well entering freshmen international students performed on the 68 item General cloze test according to the five Total TOEFL score range groups.

In summary, the data presented in Graph 1 illustrates the following results for the entering freshmen international students in the TOEFL Total score range 400 to 649 (N=70): 1) No one scored in the Independent reading level range. This indicates that all of these seventy students would have difficulty reading textbooks that lie within the upper one-third difficulty range of textbooks designated for general core courses. 2) Four students scored in the Instructional reading level range, indicating that these four students would have difficulty reading those textbooks that lie within the upper one-half difficulty range level. 3) Sixty-six students scored in the Frustration reading level range, indicating that these sixty-six students would have difficulty reading more than one-half of those textbooks designated for general core courses. 4) The mean score of each TOEFL Total score group indicates that students scored progressively higher within successively higher TOEFL Total score range groups.

The second method used to test the first hypothesis was to calculate a Pearson product-moment correlation to demonstrate the relationship between

GRAPH 1

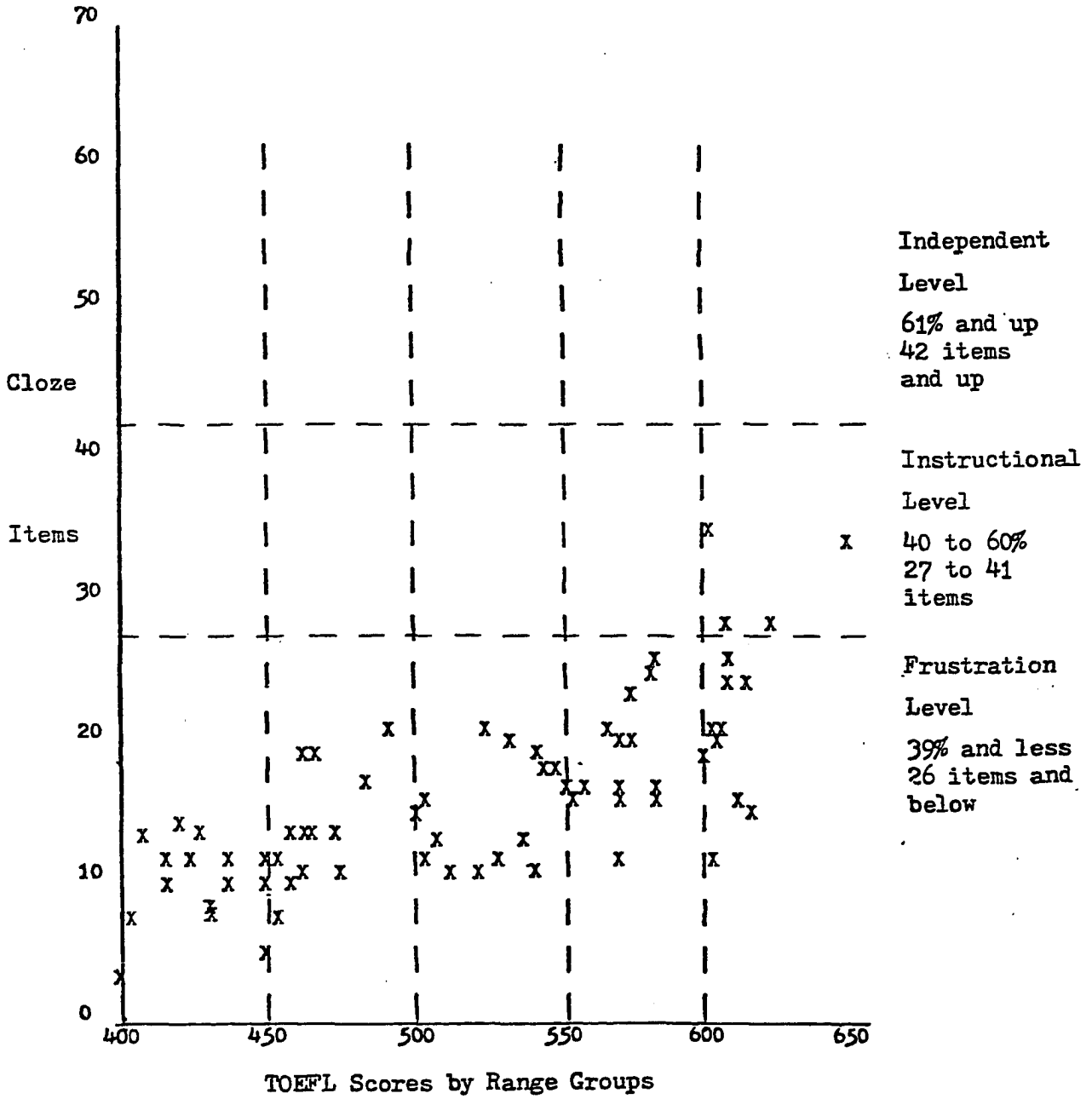
Frequency Scattergram

by

TOEFL Scores 400 to 649

on

68 Item General Cloze Test



international students' reading ability of general core course textbooks (as determined by test scores on a General cloze test) and Total scores on the TOEFL.

TABLE 2

Summary of Data for Hypothesis One for Sample

General Cloze Test Scores vs. TOEFL Total Scores (Ranges 400 to 649)		
N	Pearson Correlation Coefficient	Level of Significance
70	r = .7111	p < .001

The calculated r value for General cloze test vs TOEFL Total scores was .7111. It was determined that this r value was significant at less than the .001 level. Therefore, the null hypothesis was rejected and the alternative hypothesis was accepted. That is, there is a relationship between entering freshmen international students' general reading ability (as measured by the General cloze test) and the readability of their general textbooks (as determined by the Dale-Chall Readability Formula), and Total TOEFL scores.

The descriptive statistics for the variables General Cloze Test and TOEFL Total scores were calculated and are presented in Table 3.

Results of Testing Hypothesis 2:

Ho_2: There is no relationship between entering freshmen international students' ability to read material of major field (as measured by the cloze tests Non-Science and Science) and the readability of their designated content area textbooks (as determined by the Dale-Chall Readability Formula), and Total scores on the TOEFL.

TABLE 3

Descriptive Statistics for General Cloze Test and TOEFL Total Scores for Sample

	General Cloze Test	TOEFL Total Scores 400 to 649
N	70.000	70.000
Mean	15.143	518.343
Standard Error	0.732	8.220
Standard Deviation	6.125	68.776
Range	31.000	248.000
Minimum	3.000	400.000
Maximum	34.000	648.000

Ha_2: There is a relationship between entering freshmen international students' ability to read material of major field (as measured by the cloze tests Non-Science and Science) and the readability of their designated content area textbooks (as determined by the Dale-Chall Readability Formula), and Total scores on the TOEFL.

The Non-Science cloze test was constructed from a passage representing the upper one-third level of reading difficulty of all those Journalism textbooks analyzed. The passage selected was from a Journalism textbook and had a grade equivalent level of 11-12 according to the Dale-Chall Readability Formula. The cloze procedure employed made a test with 59 response blanks. For scoring purposes, an entering freshman international student who scored in the Independent Level (35 to 59 items correct) would be able to read Journalism

textbooks that lie within the upper one-third range of difficulty with minimal difficulty; those who scored in the Instructional Level (24 to 34 items correct) would have difficulty reading the upper one-half difficulty range level of those textbooks designated for Journalism courses; and those who scored in the Frustration Level (23 items and less correct) would have difficulty reading more than one-half of those textbooks designated for Journalism courses.

The second hypothesis was tested by two methods. First a Scattergram was constructed to demonstrate the relationship between international students' test scores on a content cloze test (Non-Science and Science), which represents the upper one-third reading difficulty of Journalism and Engineering textbooks examined (as determined by the Dale-Chall Readability Formula), and Total scores on the TOEFL.

GRAPH 2

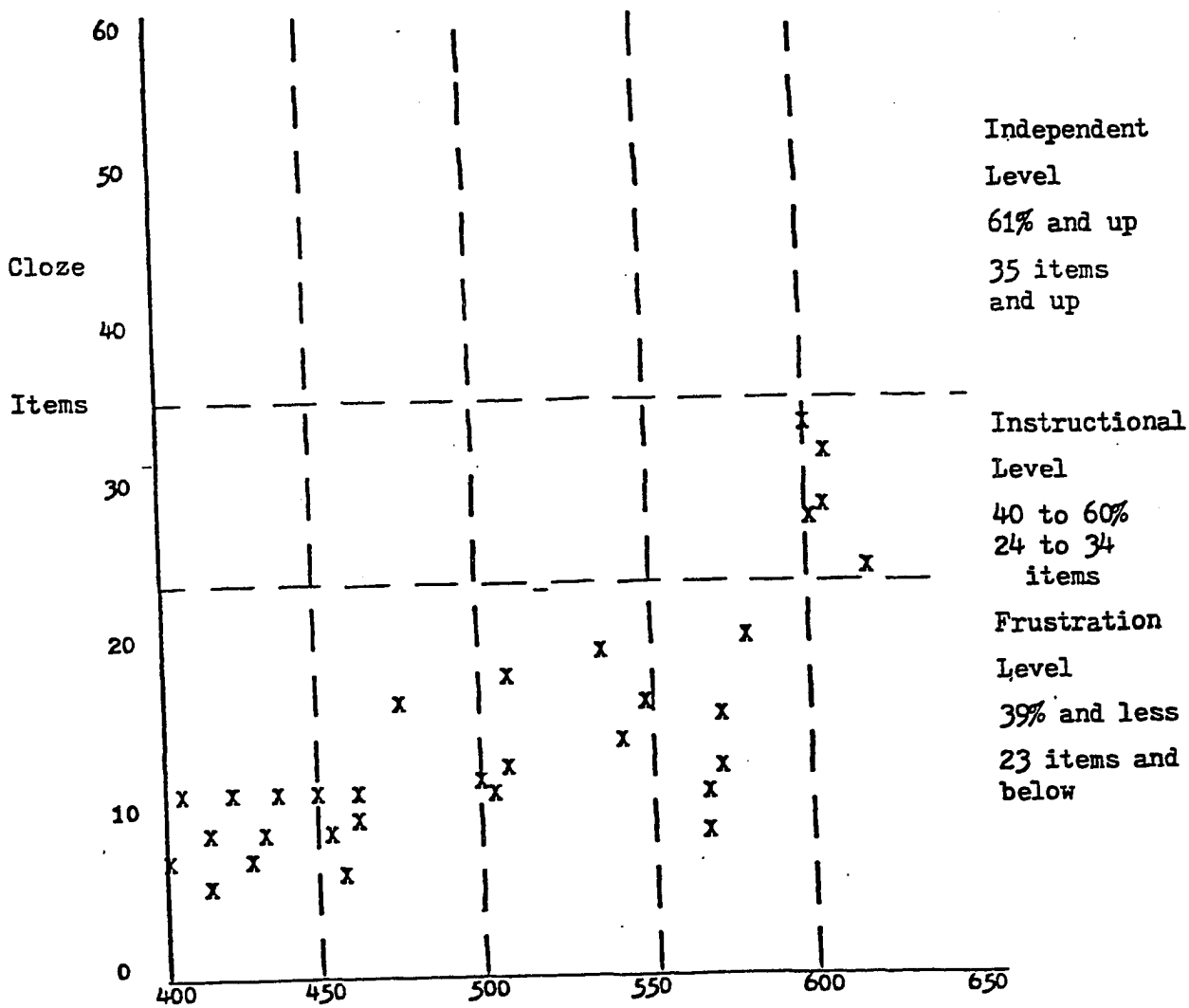
Frequency Scattergram

by

TOEFL Scores 400 to 649

on

59 Item Non-Science Cloze Test



TOEFL Scores by Range Groups

The data presented in Graph 2 demonstrate how well entering freshmen international students performed on the 59 item Non-Science cloze test according to the five Total TOEFL score range groups.

In summary, the data presented in Graph 2 illustrates the following results for the entering freshmen international students on the TOEFL Total score range 400 to 649 (N=31): 1) No one scored in the Independent reading level range. This indicates that all of these thirty-one students would have difficulty reading textbooks that lie within the upper one-third difficulty range of textbooks designated for Journalism courses. 2) Five students scored in the Instructional reading level range indicating that these five students would have difficulty reading those textbooks that lie within the upper one-half difficulty range level. 3) Twenty-six students scored in the Frustration reading range level, indicating that these twenty-six students would have difficulty reading more than one-half of those textbooks designated for Journalism courses. 4) The mean score of each TOEFL Total group indicates that students scored progressively higher within successively higher TOEFL Total score range groups, except for TOEFL Total range groups 500 to 549 and 550 to 599 which scored approximately the same.

The second method used to test the second hypothesis for Non-Science majors was to calculate a Pearson product-moment correlation to demonstrate the relationship between international students' reading ability of Journalism course textbooks (as determined by test scores on a Non-Science cloze test) and Total scores on the TOEFL.

Data relevant to this hypothesis are demonstrated in Graph 2 and Tables 4-5 for Non-Science majors and Graph 3 and Tables 6-7 for Science majors.

TABLE 4

Summary of Data for Hypothesis Two for Non-Science Majors

Non-Science Test Scores vs. TOEFL Total Scores (Ranges 400 to 649)

N	Pearson Correlation Coefficient	Level of Significance
31	r = .7801	p < .001

The calculated r value for Non-Science cloze test scores vs. TOEFL Total scores was .7801. It was determined that this r value was significant at less than the .001 level. Therefore, the null hypothesis was rejected and the alternative hypothesis was accepted for Non-Science majors. That is, a relationship did exist between entering freshmen international students' scores on the Non-Science cloze test and Total scores on the TOEFL.

The descriptive statistics for the variables Non-Science cloze test and TOEFL Total scores were calculated and are presented in Table 5.

The Science cloze test was constructed from a passage representing the upper one-third level of reading difficulty of all those Engineering textbooks analyzed. The passage selected was from an Engineering textbook and had a grade equivalent level of 13-15 according to the Dale-Chall Readability Formula. The cloze procedure employed made a test with 64 response blanks. For scoring purposes, an entering freshman international student who scored in the Independent Level (39 to 64 items correct) would be able to read Engineering

TABLE 5

Descriptive Statistics of Non-Science Cloze Test and TOEFL Total Scores for Non-Science Majors

	Non-Science Cloze Test	TOEFL Total Scores 400 to 649
N	31.000	31.000
Mean	13.968	505.355
Standard Error	1.364	12.755
Standard Deviation	7.596	71.019
Range	28.000	217.000
Minimum	5.000	403.000
Maximum	33.000	620.000

textbooks that lie within the upper one-third range of difficulty with minimal difficulty; those who scored in the Instructional level (26 to 38 items correct) would have difficulty reading the upper one-half difficulty range level of those textbooks designated for Engineering courses; and those who scored in the Frustration Level (25 items and less correct) would have difficulty reading more than the upper one-half of those textbooks designated for Engineering courses.

The data presented in Graph 3 demonstrate how well entering freshmen international students performed on the 64 item Science cloze tests according to the five Total TOEFL score range groups.

In summary, the data presented in Graph 3 illustrates the following results for entering freshmen international students in the TOEFL Total score range 400 to 649 (N=39): 1) No one scored in the Independent reading level range. This

GRAPH 3

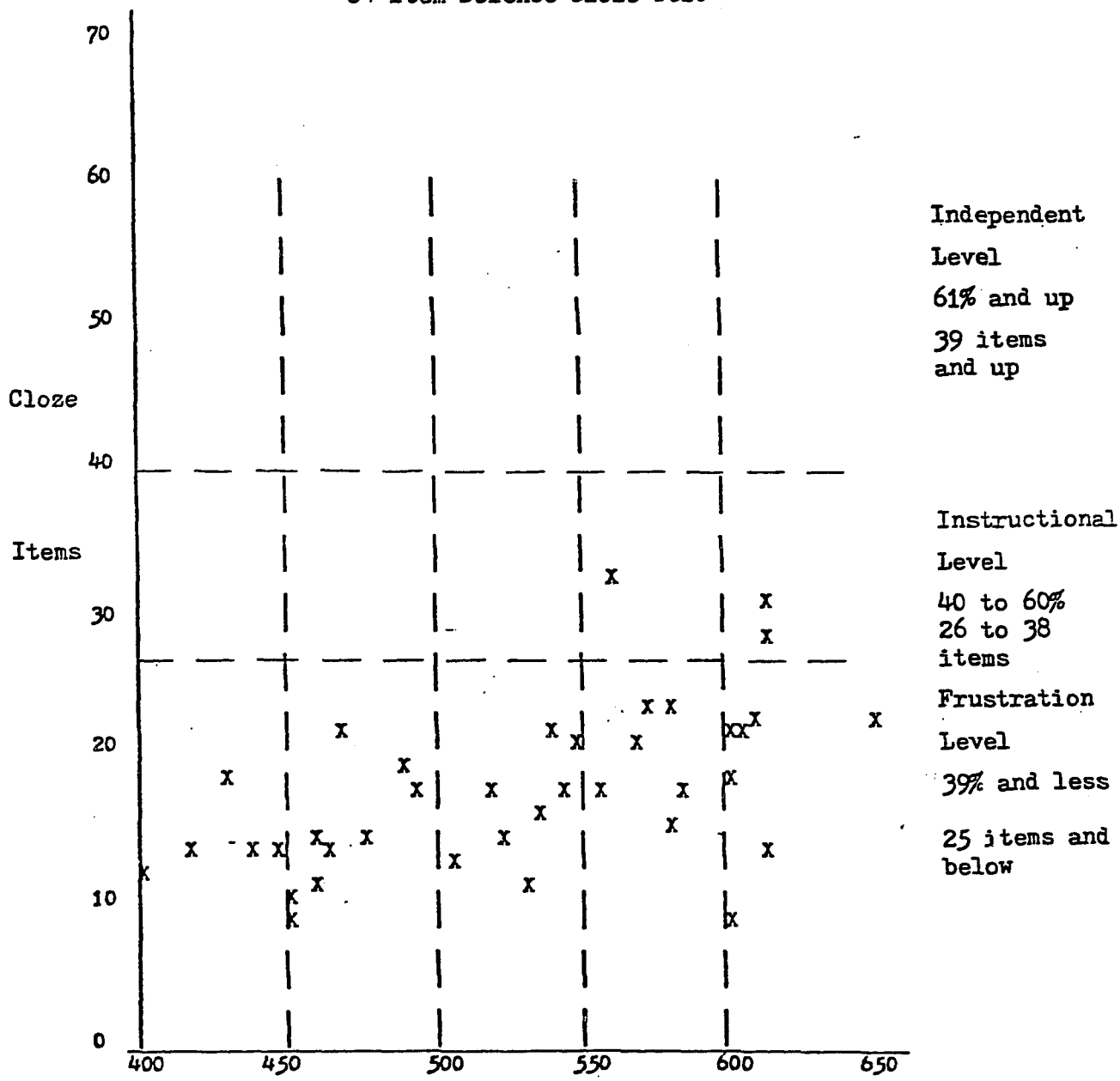
Frequency Scattergram

by

TOEFL Scores 400 to 649

on

64 Item Science Cloze Test



TOEFL Scores by Range Groups

indicated that all of these thirty-nine students would have difficulty reading textbooks that lie within the upper one-third difficulty range of textbooks designated for Engineering courses. 2) Three students scored in the Instructional reading level range indicating that these three students would have difficulty reading those textbooks that lie within the upper one-half difficulty range level. 3) Thirty-six students scored in the Frustration reading range level, indicating that these thirty-six students would have difficulty reading more than one-half of those textbooks designated for Engineering courses. 4) The mean score of each TOEFL Total group indicates that students scored progressively higher within successively higher TOEFL Total score range groups when extreme scores were eliminated.

The second method used to test the second hypothesis for Science majors was to calculate a Pearson product-moment correlation to demonstrate the relationship between international students' reading ability of Engineering course textbooks (as determined by test scores on a Science cloze test), and Total scores on the TOEFL.

TABLE 6

Summary of Data for Hypothesis Two for Science Majors

Science Test Scores vs. TOEFL Total Scores (Ranges 400 to 649)

N	Pearson Coefficient	Level of Significance
31	r = .5479	p < .001

The calculated r value for Science cloze test scores vs TOEFL Total scores was .5479. It was determined that this r value was significant at less than the .001 level. Therefore, the null hypothesis was not rejected and the alternative hypothesis was rejected. That is, there is no relationship between the scores on the Science cloze test and the Total scores on the TOEFL.

The descriptive statistics for the variables Science cloze test and TOEFL Total scores for Science majors were calculated and presented in Table 7.

TABLE 7

Descriptive Statistics of Science Cloze Test and TOEFL Total Scores for Non-Science Majors

	Science Cloze Test	TOEFL Total Scores 400 to 649
N	39.000	39.000
Mean	17.436	528.667
Standard Error	0.924	10.573
Standard Deviation	5.771	66.031
Range	24.000	248.000
Minimum	8.000	400.000
Maximum	32.000	648.000

Results of Testing Hypothesis 3:

Ho_3: There is no relationship between entering freshmen international students' general reading ability (as determined by the professional judgment of a panel of reading experts) and scores on the Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), General cloze test, and Total scores on the TOEFL.

Ha_3: There is a relationship between entering freshmen international students' general reading ability (as determined by the professional judgment of a panel of reading experts) and scores on the Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), General cloze test, and Total scores on the TOEFL.

The panel of reading experts was comprised of four persons specially trained in the area of reading. By use of informal reading inventories, constructed from general passages (level of difficulty 4 to 16 as determined by the Dale-Chall and Fry Readability Formulas), and the professional judgment of the panel of reading experts, the panel determined entering freshmen international students' general reading ability to the nearest grade level. These scores were compared to entering freshmen international students' scores on three tests previously taken: the Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), General cloze test, and TOEFL Total scores.

The third hypothesis was tested in two parts. First a Scattergram was constructed to illustrate the relationship between international students' general reading ability (as determined by the professional judgment of a panel of reading experts) and Total scores on the TOEFL.

In summary, the data presented in Graph 4 illustrates that for the international students in the TOEFL Total score range groups 400 to 649 (N=70), twenty-six students scored above the upper one-third level indicating that these students should have no difficulty reading at least two-thirds of the textbooks designated for general core courses; eighteen students should have some difficulty reading textbooks designated for general core courses that lie within

GRAPH 4

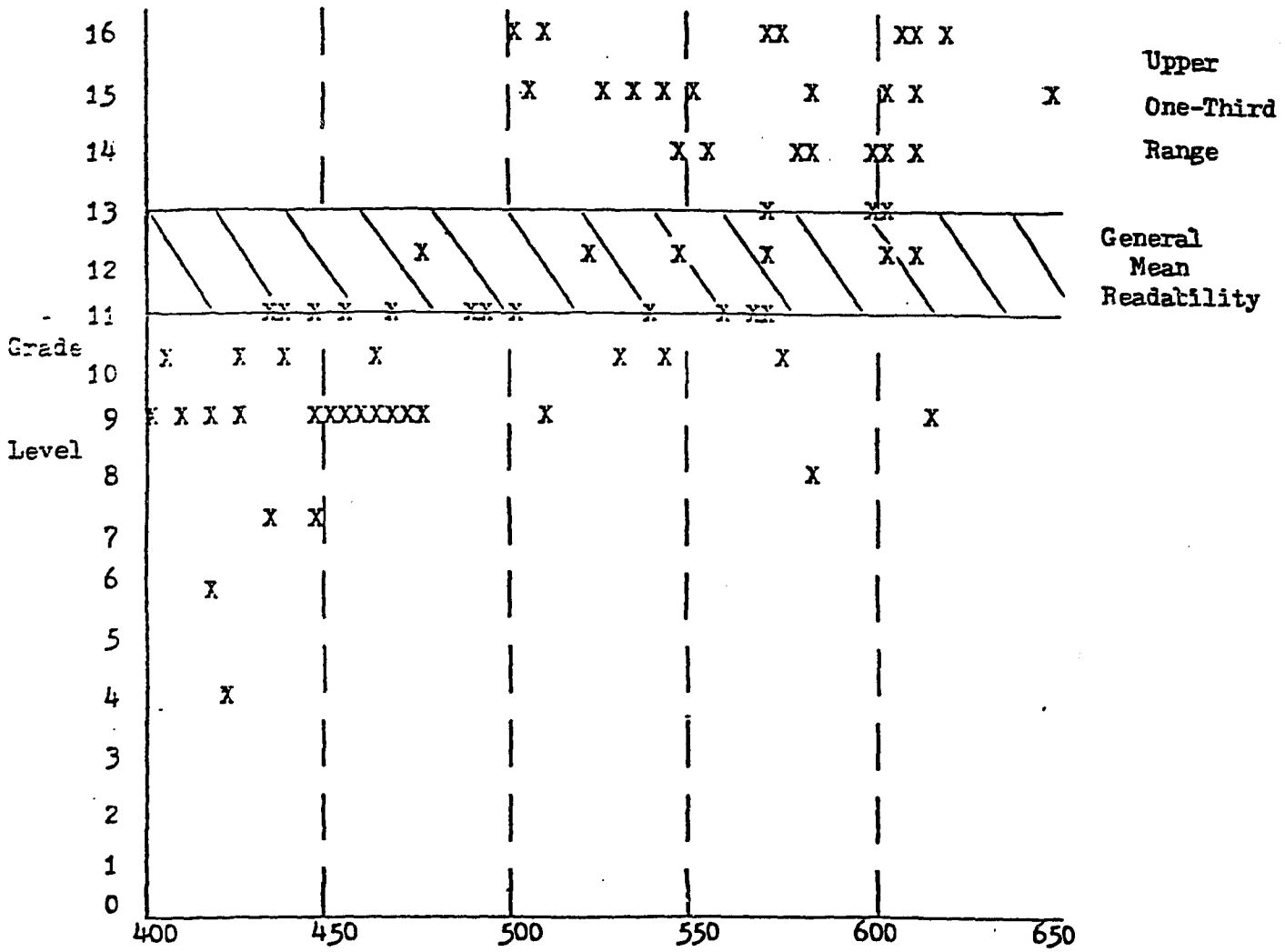
Panel of Reading Experts vs TOEFL Scores

on

General Reading

as

Compared to Readability of General Textbooks



TOEFL Scores by Range Groups

the upper one-third range of reading difficulty; and twenty-six students should have difficulty reading more than one-half of the textbooks analyzed for general core courses.

The second part in testing the third hypothesis was to calculate a Pearson product-moment correlation to demonstrate the relationship between the general reading ability of international students (as determined by the professional judgment of a panel of reading experts) with scores on the Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), General cloze test, and TOEFL Total.

TABLE 8

Summary of Data for Hypothesis Three for Total Sample

Reading Panel General Reading Scores vs Nelson-Denny Reading Test (Vocabulary, Comprehension, and Total), General Cloze Test, and TOEFL Total

N	Test Administered	Pearson Coefficient	Level of Significance
70	Nelson-Denny Vocabulary	r = .6207	$p < .001$
70	Nelson-Denny Comprehension	r = .6148	$p < .001$
70	Nelson-Denny Total	r = .6787	$p < .001$
70	General Cloze Test	r = .6139	$p < .001$
70	TOEFL Total	r = .6663	$p < .001$

The calculated r values for each variable when correlated with general reading scores determined by the professional judgment of a panel of reading experts were all significant at less than the .001 level. However, only two (Nelson-Denny Reading Test, subtest Total and TOEFL Total) tests met the

criterion of having an r value of $\pm$ .65 to $\pm$ 1.0. Therefore, the Total scores on the Nelson-Denny Reading Test and on the TOEFL were considered acceptable, but moderate, predictors of entering freshmen international students' general reading ability.

The descriptive statistics for the variables: Reading Panel General Scores, Nelson-Denny Reading Test - Vocabulary, Nelson-Denny Reading Test-Comprehension, Nelson-Denny Reading Test-Total, General cloze test, and TOEFL Total scores were calculated and presented in Table 9.

Results of Testing Hypothesis 4:

Ho_4: There is no relationship between entering freshmen international students' content (Non-Science and Science) reading ability (as determined by the professional judgment of a panel of reading experts) and those scores on the Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), Non-Science and Science cloze tests, and Total scores on the TOEFL.

Ha_4: There is a relationship between entering freshmen international students' content (Non-Science and Science) reading ability (as determined by the professional judgment of a panel of reading experts) and those scores on the Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), Non-Science and Science cloze tests, and Total scores on the TOEFL.

The panel of reading experts was comprised of four persons specifically trained in the area of reading. By use of informal reading inventories, constructed from Non-Science and Science passages (level of difficulty 4 to 16 as determined by the Dale-Chall and Fry Readability Formulas), and the

TABLE 9

Descriptive Statistics of Test Variables for General Reading of Sample

	Reading Panel General	Nelson-Denny Vocabulary	Nelson-Denny Comprehension	Nelson-Denny Total	General Cloze Test	TOEFL Total
N	70.000	70.000	70.000	70.000	70.000	70.000
Mean	11.643	23.243	28.714	51.957	15.143	518.343
Standard Error	0.337	1.090	1.239	2.120	0.732	8.220
Standard Deviation	2.823	9.121	10.367	17.734	6.125	68.776
Range	12.000	47.000	52.000	83.000	31.000	248.000
Minimum	4.000	9.000	10.000	23.000	3.000	400.00
Maximum	16.000	56.000	62.000	106.000	34.000	648.000

professional judgment of a panel of reading experts, the panel determined entering freshmen international students' content reading ability to the nearest grade level. These scores were compared to entering freshmen international students' scores on three tests previously taken: the Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), content (Non-Science and Science) cloze tests, and TOEFL Total scores.

The fourth hypothesis was tested in two parts. First a Scattergram was constructed to illustrate the relationships between entering international students' content reading ability (as determined by the professional judgment of a panel of reading experts) and Total scores on the TOEFL.

Data relevant to this hypothesis are demonstrated in Graph 5 and are summarized in Tables 10-11 for Non-Science majors and Tables 12-13 for Science majors.

In summary, the data presented in Graph 5 illustrate that for the entering freshmen international students in the TOEFL Total score range groups 400 to 649 (N=70) the results were as follows: For Non-Science majors (N=31), seventeen students scored above the upper one-third level of reading difficulty indicating that these seventeen students should have no difficulty reading at least two-thirds of the textbooks designated for Journalism courses; five students should have some difficulty reading textbooks designated for Journalism courses that lie within the upper one-third range of reading difficulty; and nine students should have difficulty reading at least one-half of the textbooks designated for Journalism courses. For Science majors (N=39), three students scored above the upper one-third level of reading difficulty indicating that these three students should have no difficulty reading at least two-thirds of the

GRAPH 5

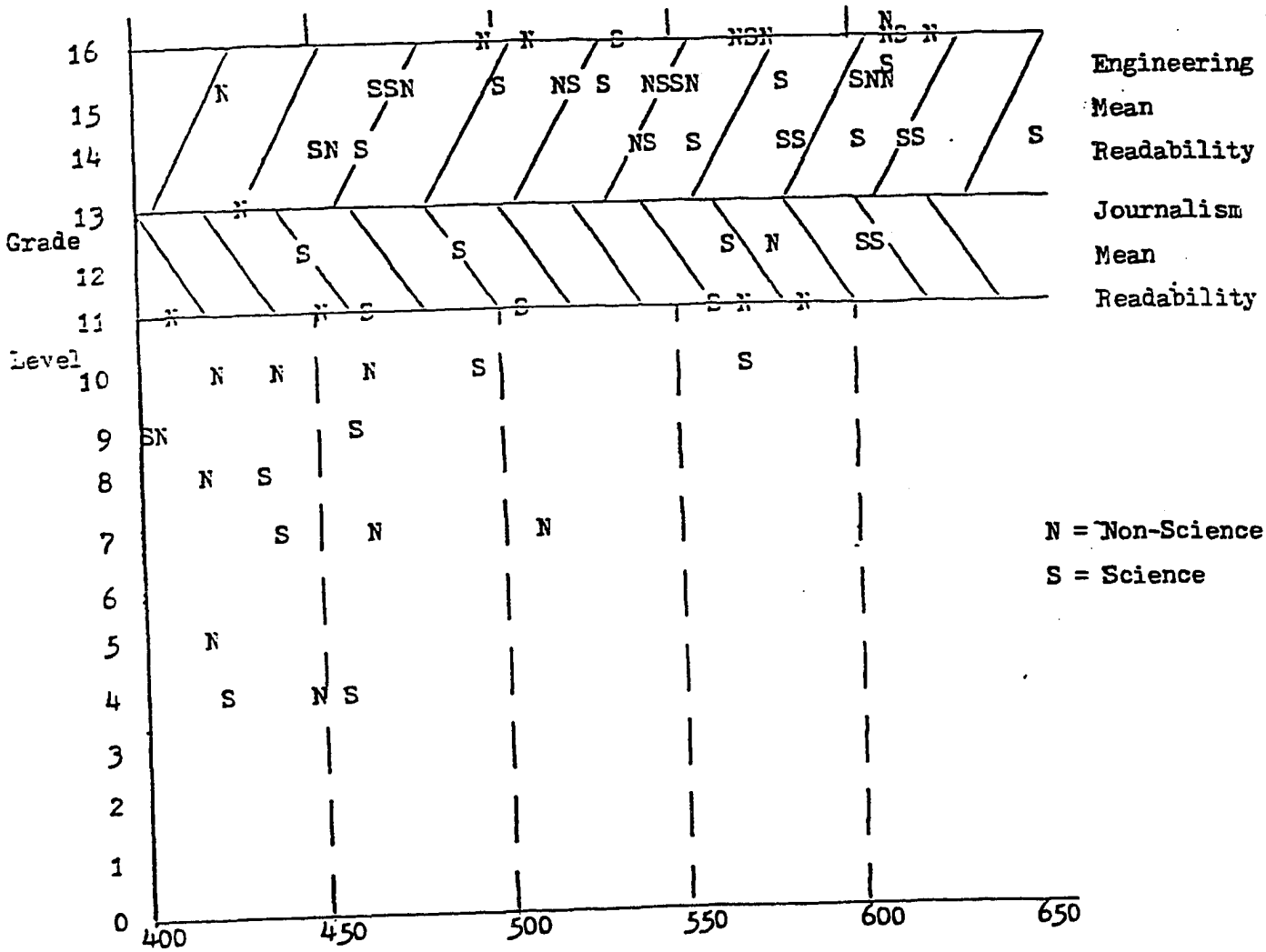
Panel of Reading Experts vs TOEFL Scores

on

Content Reading

as

Compared to Readability of Content Textbooks



TOEFL Scores by Range Groups

textbooks designated for Engineering courses; twenty students should have some difficulty reading textbooks designated for Engineering courses that lie within the upper one-third range of difficulty; and sixteen students should have difficulty reading at least one-half of the textbooks designated for Engineering courses.

The second part in testing the fourth hypothesis was to calculate a Pearson product-moment correlation to demonstrate the relationships between the content reading ability (Non-Science and Science) of entering freshmen international students (as determined by the professional judgment of a panel of reading experts) with scores on the Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), content (Non-Science and Science) cloze tests, and TOEFL Total.

TABLE 10

Summary of Data for Hypothesis Four - Non-Science Sample

Reading Panel Non-Science Scores vs Nelson-Denny Reading Test (Vocabulary, Comprehension, and Total), Non-Science Cloze Test scores, and TOEFL Total

N	Test Administered	Pearson Coefficient	Level of Significance
31	Nelson-Denny Vocabulary	$r = .5770$	$p < .001$
31	Nelson-Denny Comprehension	$r = .5802$	$p < .001$
31	Nelson-Denny Total	$r = .6308$	$p < .001$
31	General Cloze Test	$r = .4504$	$p < .001$
31	TOEFL Total	$r = .5972$	$p < .001$

The calculated r values for each variable when correlated with Non-Science reading scores as determined by the professional judgment of a panel of reading experts were all significant at less than or equal to the .001 level with the exception of the Non-Science cloze test (p=.013). However, no test was accepted as a good predictor of Non-Science reading ability due to failure of meeting the set criterion of having an r value between $\pm$ .65 to $\pm$ 1.0.

The descriptive statistics for the variables: Reading Panel Non-Science scores, Nelson-Denny Reading Test-Vocabulary, Nelson-Denny Reading Test-Comprehension, Nelson-Denny Reading Test-Total, Non-Science cloze test, and TOEFL Total Scores were calculated and presented in Table 11.

TABLE 11

Descriptive Statistics of Test Variables for Non-Science Majors

	Reading Panel Non-Science	Nelson-Denny Vocabulary	Nelson-Denny Comprehension	Nelson-Denny Total	General Cloze Test	TOEFL Total
N	31.000	31.000	31.000	31.000	31.000	31.000
Mean	12.258	21.871	28.452	50.323	13.968	505.355
Standard Error	0.637	1.576	1.789	3.095	1.364	12.755
Standard Deviation	3.549	8.774	10.009	17.231	7.596	71.019
Range	12.000	41.000	40.000	71.000	28.000	217.000
Minimum	4.000	9.000	10.000	23.000	5.000	403.000
Maximum	16.000	50.000	50.000	94.000	33.000	620.000

TABLE 12

Summary of Data for Hypothesis Four - Science Sample

Reading Panel Science Scores vs Nelson-Denny Reading Test (Vocabulary, Comprehension, and Total), Science Cloze Test scores, and TOEFL Total

N	Test Administered	Pearson Coefficient	Level of Significance
39	Nelson-Denny Vocabulary	r = .4748	p = .002
39	Nelson-Denny Comprehension	r = .4571	p = .003
39	Nelson-Denny Total	r = .5134	p < .001
39	General Cloze Test	r = .2901	p = .073
31	TOEFL Total	r = .5667	p < .001

The calculated r values for each variable when correlated with Engineering scores as determined by the professional judgment of a panel of reading experts were all significant at less than the .10 level. However, no test was accepted as a good predictor of Science reading ability for failure to meet the criterion of an r value of $\pm$ .65 to $\pm$ 1.0.

The descriptive statistics for the variables: Reading Panel Science scores, Nelson-Denny Reading Test-Vocabulary, Nelson-Denny Reading Test-Comprehension, Nelson-Denny Reading Test-Total, Science cloze test, and TOEFL Total scores were calculated and presented in Table 13.

TABLE 13

Descriptive Statistics of Test Variables for Science Majors

	Reading Panel Science	Nelson-Denny Vocabulary	Nelson-Denny Comprehension	Nelson-Denny Total	General Cloze Test	TOEFL Total
N	39.000	39.000	39.000	39.000	39.000	39.000
Mean	12.744	24.333	28.923	53.256	17.436	528.667
Standard Error	0.499	1.498	1.724	2.921	0.924	10.573
Standard Deviation	3.118	9.356	10.769	18.242	5.771	66.031
Range	12.000	46.000	50.000	77.000	24.000	248.000
Minimum	4.000	10.000	12.000	29.000	8.000	400.000
Maximum	16.000	56.000	62.000	106.000	32.000	648.000

Summary of Results

The results of testing the four hypotheses may be summarized as follows:

It was found that although no entering freshman international student could read general textbooks that lie within the upper one-third range of reading difficulty, there was a significant relationship between the students' TOEFL Total score and how well they performed on the General cloze test.

It was found that although no entering freshman international student could read Journalism textbooks that lie within the upper one-third range of reading difficulty, there was a significant relationship between the students' TOEFL Total score and how well they performed on the Non-Science cloze test.

It was found that although no entering freshman international student could read Engineering textbooks that lie within the upper one-third range of reading difficulty, there was a significant but non-acceptable relationship between the students' TOEFL Total score and how well they performed on the Science cloze test.

It was found that 26 out of 70 entering freshmen international students (approximately 37%) were determined by the professional judgment of a panel of reading experts to be able to read general textbooks that lie within the upper one-third range of reading difficulty.

In determining which test, Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), General cloze test, or TOEFL Total score is a good predictor of general reading ability (as determined by the professional judgment of a panel of reading experts); it was found that two tests

(the Total scores on the Nelson-Denny Reading Test and TOEFL examination) were acceptable, but moderate, predictors of an entering freshman international student's general reading ability.

It was found that 17 out of 31 entering freshmen international students (approximately 55%) were determined by the professional judgment of a panel of reading experts to be able to read Journalism textbooks that lie within the upper one-third range of reading difficulty.

In determining which test, Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), Non-Science cloze test, or TOEFL Total score is a good predictor of Journalism reading ability (as determined by the professional judgment of a panel of reading experts); it was found that no test was an acceptable predictor of international students' Journalism reading ability. However, the Total score on the Nelson-Denny Reading Test indicated a relationship that, although not accepted, was substantial.

It was found that 3 out of 39 entering freshmen international students (approximately 8%) were determined by the professional judgment of a panel of reading experts to be able to read Engineering textbooks that lie within the upper one-third range of reading difficulty.

In determining which test, Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), Science cloze test, or TOEFL Total score, is a good predictor of Engineering reading ability (as determined by the professional judgment of a panel of reading experts); it was found that no test was an acceptable predictor of entering freshmen international students' Engineering reading ability.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Introduction

The purpose of this chapter is to present the summary, findings, conclusions, and recommendations that resulted from this study. The summary reviews the purpose of the study, the procedures used in the study, and the findings as indicated by the analysis of data. The conclusions present inferences drawn from this study. Recommendations are made for educational institutions which admit international students and for further research. The intent of this study was not to develop specific proposals for curricula but to provide guidelines for admissions policies of international students.

Summary

The purpose of this study was to determine to what extent entering freshmen international students can read their textbooks, and what implications this may have for international students seeking admission to a Southwestern state university.

More specifically, this study was designed to provide answers to the following questions:

1. In predicting the general and content reading ability of entering freshmen international students, which test used (TOEFL, Nelson-Denny Reading

Test, or tests using the cloze procedure) is the most valid instrument when compared to a reading grade level determined by the professional judgment of a panel of reading experts?

2. To what extent are entering freshmen international students seeking enrollment at a Southwestern state university, able to read general textbooks and textbooks of their designated major as determined by cloze tests and the professional judgment of a panel of reading experts?

Procedures

In cooperation with the University of Oklahoma and the ELS Language Center of Norman, a stratified random sample of 70 entering freshmen international students, of which fourteen were randomly chosen from each of five TOEFL Total score range groups, were selected for use in this study.

Students were administered the Nelson-Denny Reading Test, Form A, a General cloze test (representing the upper one-third level of reading difficulty of those general textbooks examined), a content (Non-Science and Science) cloze test (representing the upper one-third level of reading difficulty of those Journalism and Engineering textbooks examined), and a grade level reading score for general and content reading determined by the professional judgment of a panel of reading experts.

The Pearson product-moment correlation was utilized to measure the relationships that may exist between variables. In addition, Scattergrams were constructed to illustrate graphically the spread of scores and to further demonstrate the relationship between scores among the TOEFL groups.

Findings

The results of testing the four hypotheses were as follows:

It was found that although no entering freshman international student could read general textbooks that lie within the upper one-third range of reading difficulty, there was a significant relationship between the students' TOEFL Total score and how well they performed on the General cloze test.

It was found that although no entering freshman international student could read Journalism textbooks that lie within the upper one-third range of reading difficulty, there was a significant relationship between the students' TOEFL Total score and how well they performed on the Non-Science cloze test.

It was found that although no entering freshman international student could read Engineering textbooks that lie within the upper one-third range of reading difficulty, there was a significant, but non-criterial relationship between the students' TOEFL Total score and how well they performed on the Science cloze test.

It was found that 26 out of 70 entering freshmen international students (approximately 37%) were determined by the professional judgment of reading experts to be able to read general textbooks that lie within the upper one-third range of reading difficulty.

In determining which test, Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), General cloze test, or TOEFL Total score is a good predictor of general reading ability (as determined by the professional judgment of a panel of reading experts); it was found that two tests (the Total scores on the Nelson-Denny Reading Test and TOEFL examination) were acceptable, but moderate, predictors of an entering international freshman students' general reading ability.

It was found that 17 out of 31 entering freshmen international students (approximately 55%) were determined by the professional judgment of a panel of reading experts to be able to read Journalism textbooks that lie within the upper one-third range of reading difficulty.

In determining which test, Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), Non-Science cloze test, or TOEFL Total score is a good predictor of Journalism reading ability (as determined by the professional judgment of a panel of reading experts); it was found that no test was an acceptable predictor of entering freshmen international students' Journalism reading ability. However, the Total score on the Nelson-Denny Reading Test indicated a relationship that, although not accepted, was substantial.

It was found that 3 out of 39 entering freshmen international students (approximately 8%) were determined by the professional judgment of a panel of reading experts to be able to read Engineering textbooks that lie within the upper one-third range of reading difficulty.

In determining which test, Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), Science cloze test, or TOEFL Total score is a good predictor of Engineering reading ability (as determined by the professional judgment of a panel of reading experts); it was found that no test was an acceptable predictor of entering freshmen international students' Engineering reading ability.

Conclusions

The Pearson product-moment correlation and scattergrams were used to test and illustrate hypotheses one through four. Acceptance or rejection of these proposed hypotheses statements was based on the value of the correlation coefficient ($r = \pm .65$ to ± 1.0) and the .10 level of significance. The conclusions drawn in this section of the study were based on the results observed when the data were analyzed, interpreted, and synthesized in Chapter IV.

Hypothesis 1 stated that:

Ho_1: There is no relationship between entering freshmen international students' general reading ability (as determined by the General cloze test) and the readability of their general textbooks (as determined by the Dale-Chall Readability Formula), and TOEFL Total scores.

Ha_1: There is a relationship between entering freshmen international students' general reading ability (as determined by the General cloze test) and the readability of their general textbooks (as determined by the Dale-Chall Readability Formula), and TOEFL Total scores.

The first hypothesis was tested by two methods. First a scattergram was constructed to demonstrate the relationship between entering freshmen international students' test scores on a General cloze test, which represents the upper one-third reading difficulty range of textbooks examined (as determined by the Dale-Chall Readability Formula), and Total scores on the TOEFL. Results indicated that no student would be able to read general textbooks that lie within the upper one-third level of difficulty of textbooks examined.

The second method used to test this hypothesis was to perform a Pearson product-moment correlation to demonstrate the relationship between entering

freshmen international students' reading ability of general core course textbooks (as determined by test scores on a General cloze test) and Total scores on the TOEFL.

Hypothesis 2 stated that:

Ho_2: There is no relationship between entering freshmen international students' ability to read material of their major field (as measured by the Non-Science and Science cloze test) and the readability of their designated content area textbooks (as determined by the Dale-Chall Readability Formula), and TOEFL Total scores.

Ha_2: There is a relationship between entering freshmen international students' ability to read material of their major field (as measured by the Non-Science and Science cloze test) and the readability of their designated content area textbooks (as determined by the Dale-Chall Readability Formula), and TOEFL Total scores.

The second hypothesis was tested by two methods. First, scattergrams were constructed to demonstrate the relationship between entering freshmen international students' test scores on a content cloze test (Non-Science or Science), which represents the upper one-third reading difficulty of textbooks examined (as determined by the Dale-Chall Readability Formula), and Total scores on the TOEFL. Results indicated that for Non-Science majors, no student would be able to read Journalism textbooks that lie within the upper one-third level of difficulty of textbooks examined. For Science majors, results indicated that no student would be able to read Engineering textbooks that lie within the upper one-third level of difficulty of Engineering textbooks examined.

The second method used to test the second hypothesis for Non-Science and Science majors was to perform Pearson product-moment correlations to demonstrate the relationship between international students' reading ability of Journalism and Engineering textbooks (as determined by test scores on the TOEFL. Results for Non-Science majors indicated that there was a significant relationship between the Non-Science cloze test and the TOEFL Total score. For Science majors, there was no relationship between Science cloze test scores and the TOEFL Total scores. Therefore, the alternative hypothesis Ha_2 was accepted for Non-Science majors and the null hypothesis Ho_2 was not rejected for Science majors.

Hypothesis 3 stated that:

Ho_3: There is no relationship between entering freshmen international students' general reading ability (as determined by the professional judgment of a panel of reading experts) and scores on the Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), General cloze test, and the Total score on the TOEFL examination.

Ha_3: There is a relationship between entering freshmen international students' general reading ability (as determined by the professional judgment of a panel of reading experts) and scores on the Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), General cloze test, and Total scores on the TOEFL examination.

The third hypothesis was tested in two parts. First Scattergrams were constructed to illustrate the relationship between international students' general reading ability (as determined by the professional judgment of a panel of reading

experts), and Total scores on the TOEFL. Results indicated that twenty-six students were judged to be reading at a grade equivalent level which indicates that they could read those general textbooks that lie within the upper one-third level of reading difficulty.

The second part in testing the third hypothesis was to perform a Pearson product-moment correlation to demonstrate the relationship between the general reading ability of international students (as determined by the professional judgment of a panel of reading experts) with scores on the Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), General cloze test, and TOEFL Total. Results indicated that two tests, Nelson-Denny Reading Test Total scores and TOEFL Total scores, were significant predictors of entering freshmen international students' general reading ability. Therefore, the alternative hypothesis Ha_3 was accepted for Total scores on the Nelson-Denny Reading Test and TOEFL.

Hypothesis 4 stated that:

Ho_4: There is no relationship between entering freshmen international students' content (Non-Science and Science) reading ability (as determined by the professional judgment of a panel of reading experts) and scores on the Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), Non-Science and Science cloze tests, and the Total score on the TOEFL examination.

Ha_4: There is a relationship between entering freshmen international students' content (Non-Science and Science) reading ability (as determined by the professional judgment of a panel of reading experts) and scores on the

Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), Non-Science and Science cloze tests, and the Total score on the TOEFL examination.

The fourth hypothesis was tested in two parts. First Scattergrams were constructed to illustrate the relationship between international students' content (Non-Science and Science) reading ability and Total scores on the TOEFL. Results indicated that for Non-Science majors 17 out of 31 students (approximately 55%) were judged to be reading at a grade equivalent level which indicates that they could read those Journalism textbooks that lie within the upper one-third level of reading difficulty. For Science majors, results indicated that only 3 out of 39 international students (approximately 8%) were judged to be reading at a grade equivalent level which indicates that they could read those Engineering textbooks that lie within the upper one-third level of reading difficulty.

The second part in testing the fourth hypothesis was to perform Pearson product-moment correlations to demonstrate the relationships between the content reading ability (Non-Science and Science) of international students (as determined by the professional judgment of a panel of reading experts) with scores on the Nelson-Denny Reading Test (subtests: Vocabulary, Comprehension, and Total), content cloze tests, and TOEFL Total. Results indicated that for Non-Science majors, no test was found to have a significant correlation coefficient. For Science majors, no test was found to have a significant correlation coefficient. Therefore, the null hypothesis Ho_4 was not rejected.

Interpretation of Results

It was found that no entering international freshman student scored in the Independent reading level on the General cloze test, the Non-Science cloze test, and the Science cloze test. The conclusion from these tests would indicate that no international student would be able to read general or content (Journalism and Engineering) textbooks that lie within the upper one-third range of reading difficulty. However, evaluations of entering freshmen international students' general and content (Journalism and Engineering) reading ability, by the professional judgment of a panel of reading experts, indicated that: 1) Twenty-six of the seventy entering international freshmen (approximately 37%) should in fact, be able to read general textbooks that lie within the upper one-third range of reading difficulty; 2) For Non-Science majors, seventeen out of thirty-one (approximately 55%) entering freshmen international students should be able to read Journalism textbooks that lie within the upper one-third range of reading difficulty; and 3) For Science majors, three out of thirty-nine (approximately 8%) entering freshmen international students should be able to read Engineering textbooks that lie within the upper one-third range of difficulty.

This discrepancy may be resolved by considering the following points:

1. Many students expressed that they found the cloze technique to be very difficult. It was a test form never experienced by most international students tested. This unfamiliarity could contribute to poor performance.

2. Although the General and Non-Science cloze test scores may or may not have measured accurately the international students' ability to read a particular passage, it did indicate a relationship between cloze scores and scores on the TOEFL Total. This may suggest that the cloze is measuring language proficiency

more than reading ability. This is supported by the correlations between TOEFL Total and General cloze scores ($r = .7111$ $p < .001$) and TOEFL Total and Non-Science cloze scores ($r = .7801$ $p < .001$). This is also supported by the fact that cloze raw scores on the General, Non-Science, and Science cloze tests progressively increased within successively higher TOEFL Total score group ranges.

3. The cloze test and the informal reading inventories measured different reading skills. This is supported in part by the fact that the correlations between reading panel general scores and General cloze scores ($r = .6139$ $p < .001$), reading panel Non-Science scores and Non-Science cloze scores ($r = .4504$ $p = .011$), and reading panel Science and Science cloze scores ($r = .2901$ $p = .073$).

Therefore, the researcher concluded that the results of the cloze test are useful as a measure much like the TOEFL examination and may be a good predictor of language proficiency. This interpretation has been supported by numerous cloze studies (Taylor, 1956; Darnell, 1968; and Oller, 1971, 1972). The reading panel's evaluations are measures of a students "true" reading ability. These individual evaluations are considered the most accurate measures of reading ability due to the nature of the evaluation and the professional judgment of a panel of reading experts.

Results of entering freshmen international students' general, Non-Science, and Science reading ability (as determined by the professional judgment of a panel of reading experts) supported a well known theory in reading. That is, when a student reads a passage that is of interest to him, he tends to have better comprehension over the material than when reading a passage of neutral or little interest. For this study sample, entering freshmen international students scored progressively higher on the content passages related to their designated majors

when compared to their scores on general passages. This is supported by the Pearson product-moment correlations between reading panel general scores and reading panel content scores (Non-Science $r = .8288$ $p < .001$) and (Science $r = .6761$ $p < .001$). Additional support is given by the reading panel general mean score ($\bar{X} = 11.643$, $N = 70$) of entering freshmen international students, the reading panel Non-Science mean score ($\bar{X} = 12.258$, $N = 31$), and the reading panel Science mean score ($\bar{X} = 12.744$, $N = 39$).

The TOEFL Total score and the Nelson-Denny Reading Test Total score were found to be moderate predictors of entering freshmen international students' ability to read textbooks of general core courses. Due to the cost and time involved in the administration of the TOEFL examination, the Nelson-Denny Reading Test would be as effective in predicting international students' ability to read general textbooks; and therefore, would be the most efficient test to administer entering freshmen international students.

In attempting to determine which test (Nelson-Denny Reading Test, Non-Science and Science cloze tests, and TOEFL), when compared to a content reading level determined by the professional judgment of a panel of reading experts, is the best predictor of an entering freshman international student's content reading ability, the results indicated that none of the tests examined were acceptable predictors. The Nelson-Denny Reading Test did however, indicate a fairly strong relationship and with further research may be found to be a moderate predictor of content reading ability.

Implications

The University of Oklahoma has certain standards and regulations that are designed to assist admission officers in selecting those students who have the

potential of successfully completing the academic requirements of any given degree program at the University. One such regulation is that entering freshmen candidates are required to take the ACT (American College Test) examination. The Total score on the ACT is used to assist these officials in determining eligibility of a candidate to the University. Subtest scores are used to advise students regarding specific course offerings and alleged weaknesses in their academic preparation. For example, freshmen candidates who score substantially low on the ACT Social Studies subtest, are required to enroll in a reading improvement course to better prepare these students for their college career. Apparently the University feels that the ability to read well is critical to success at the University. What is interesting to note is that there is no such screening or requirement placed on entering freshmen international student candidates.

One important result of this study was that two tests were found to be moderate predictors of entering freshmen international students' general reading ability. What this could mean to admission officers and advisors of international students is quite clear. One, the TOEFL Total score and the Nelson-Denny Reading Test Total score can be used to screen entering freshmen international student candidates, as far as their general reading ability; and this screening can assist advisors in requiring those students who need additional reading skills to take the courses that will most benefit them in their college endeavors. Two, the University has the facilities and the personnel to assist the international student on a more equalitarian basis with the services provided for native speakers.

It is obvious from the test results of this study that the majority of entering freshmen international students have difficulty reading at least one-

third of their textbooks. If, in fact, the college textbook has some importance in today's university, then the faculty should consider the use of alternative textbooks that are written at a grade level more commensurate with the students who are required to read them. This may not be of great concern to those professors who are seldom subject to a substantial number of international students in their classroom; but, in some major areas, international students are the majority, not the overlooked few. With one out of every twelve students at the University of Oklahoma being classified as an international student, the need is there to make every attempt to match student reading ability with the readability of textbooks used.

In this study the evaluation of an entering freshman international student's reading ability, as determined by the professional judgment of a panel of reading experts, was considered to be the most accurate assessment of the student's "true" reading ability. A close examination of entering freshmen international students' general reading ability revealed that the students in the Total TOEFL range group 500 to 549 scored virtually the same as those international students in the Total TOEFL range group 550 to 599. This is supported by the results of a SAS (Systems Analysis System) program of multiple analysis of variance performed on test scores between both groups. The F value calculated is the ratio produced by dividing MS (Model) by MS (Error). It is designed to evaluate how well the Model, as a whole (after adjusting for the mean), accounts for the dependent variable's behavior. If significance probability, PR, is small, it indicates significance. These results revealed that for the General cloze test ($F = 4.94$ $p = .0351$) there was no significant difference between the two TOEFL groups.

There are several implications that can be drawn from these results:

1. At present, the University of Oklahoma admits only those international students who score a 550 or above on the TOEFL examination. The results of this study indicate that students who score between 500 to 549 on the TOEFL examination, have virtually the same test results on the General cloze test. This appears to support the findings of the ETS (Educational Testing Service) TOEFL Manual (1978) which states that one student's TOEFL score is not significantly different from another student's unless there is a TOEFL Total raw score difference of at least 32 points. Furthermore, ETS recommended that colleges admit students with a TOEFL score of 500 and above, provided that the college limit the academic load and provide support services for those students who score between 500 and 549 on the TOEFL. Support is also provided for this interpretation by the results of other research studies which claim that the cloze test is a good measure of language proficiency. Because international students in both groups scored virtually the same on the General cloze test, it may be concluded that their language proficiency is virtually the same.

2. There was not a significant difference found between the entering freshmen international students' scores on the Nelson-Denny Reading Test Total score ($F = .30$ $p = .5904$) and general reading levels, as determined by the professional judgment of a panel of reading experts, ($F = .02$ $p = .8798$) between TOEFL Total score range groups 550 to 599 and 500 to 549. These results indicate that there is not a significant difference of an entering freshman international student's general reading ability from TOEFL scores 500 to 549 and 550 to 599. This may be important in the admission of potential international freshmen students, because these results indicated that students in either TOEFL Total groups have virtually the same general reading ability.

3. In conjunction with implications one and two, this researcher suggests that the Nelson-Denny Reading Test be used as another screening instrument in assisting admission officers in determining an entering freshman international student candidate's eligibility for admission to the University of Oklahoma. This instrument has several advantages: 1) It is a standardized reading test that can be administered to groups or individuals; 2) It requires no special training to administer this test; 3) Total administration time is approximately 40 minutes; 4) It is a good discriminator between international students' general reading ability; and 5) It can be used to predict how well international students can read textbooks of general core courses at the University of Oklahoma.

The three implications state above suggest that the Nelson-Denny Reading Test could complement the TOEFL examination as an admission screening instrument for university officials. This is supported by a subsidiary analysis using the SAS subprogram Stepwise. The results of this analysis demonstrated that although the Nelson-Denny Reading Test Total score ($r = .679$) is a better predictor than the TOEFL Total score ($r = .666$) of international students' general reading ability, the two tests together (Nelson-Denny Reading Test and the TOEFL) is the best predictor ($r = .726$) of the tests utilized in this study. In addition, this combined-test predictor is accurate enough to predict international freshmen students' general reading ability to within 1.971 of a grade level (as determined by the panel of reading experts). Furthermore, the Nelson-Denny Reading Test could assist instructors in matching the reading difficulty level of textbooks with the reading ability of their students who use them. Also, the Nelson-Denny Reading Test could be used to advise international students as to course offerings and support services. However, it should be noted that due to

the limited number of international students and the power of the test used in determining the results that led to these implications, these implications are tentative and need to be supported by additional research.

Recommendations

The following recommendations resulted from the study:

1. Instructors should be aware of international freshmen students' reading capabilities. This, in turn, should assist instructors in the selection of textbooks used in general and content courses.
2. International students should be screened for potential reading problems and be required to enroll in a developmental reading course, as are native speakers.
3. College admission officers should investigate the use of the Nelson-Denny Reading Test as a supplement to the TOEFL examination in admitting international student candidates.

Recommendations for Further Research

The following studies are recommended for possible further research:

1. This study should be replicated with the following changes:
   A. Use native speakers of English and international students to permit a comparison on test performance.
   B. Use various forms of the cloze procedure, as well as content areas, and levels of difficulty.
   C. Score the cloze test results using Donald Darnell's "clozentropy" procedures (1968).

D. Use only two TOEFL Total score range groups, 500 to 549 and 550 to 599, with a large sample size, to test for significant differences between groups.

E. Use a sample of international graduate students to test reading ability within specific content areas.

2. A longitudinal study should be conducted to determine if entering freshmen international students' reading ability will predict college success.

3. A study should be conducted to validate the Nelson-Denny Reading Test with international students.

4. A study should be conducted to further investigate the use of the TOEFL Total score and the Nelson-Denny Reading Test Total score as predictors of international students reading ability in admitting international students to the University of Oklahoma.

A SELECTED BIBLIOGRAPHY

American Language Institute (Georgetown). A report on the results of English testing during the 1966 pre-university workshop at the American Language Institute, Georgetown University, Unpublished manuscript, October, 1966.

Anderson, Jonathon. "The Application of Cloze Procedure to English Learned as a Foreign Language in Papua and New Guinea." English Language Teaching, 1972, 27, 66-72.

Angoff, William and Sharon, Amiel. The Test of English as a Foreign Language by Native American College Students and Foreign Applicants to U.S. Colleges. Research Bulletin 70-8, Educational Testing Service, Princeton, New Jersey, February, 1970.

Bartoo, Roy K. "The Effect of Cumulative Context upon Cloze Test Performance of Tenth Graders," doctoral dissertation, State University of New York at Buffalo, 1975.

Beard, J.G. "The Comprehensibility of High School Textbooks: Association with Content Areas." Journal of Reading, 1967, 11, 229-235.

Beechhold, H.F. The Creative Classroom - Teaching Without Textbooks. New York: Charles Scribner's Sons, 1971.

Black, H. The American Schoolbook. New York: William Morrow, 1967.

Blair, Allen M. "Everything You Always Wanted to Know About Readability but Were Afraid to Ask", Elementary English, 1971, 48, 442.

Bormuth, John R. "The Cloze Readability Procedure". Elementary English, 1968, 45, 193-198.

Buckingham, B.R., and Dolch, E.W. A Combined Word List. Boston: Ginn and Company, 1936.

Burford, E. Jr. "The Reading Ability of College Freshmen Earth Science Students Compared With the Readability of Selected Earth Science Textbooks. Dissertation Abstracts International, 30: 5315A - 5316A June 1970.

Burkhead, M.B. "A Study of the Readability of Selected Introductory Management Textbooks", Unpublished dissertation, Texas Tech University, 1975.

Burkhead, Marie and Ulferts, Greg. "Sample Frequency in Application of Dale-Chall Readability Formula". Journal of Reading Behavior, 1977, 9, 3, 287-290.

Carlson, N.A. "Statistics of the Month - Foreign Students Enrolled in American Institutions of Higher Education." American Education, 1971, 7, 33.

Caylor, John S., et al. Methodologies for Determining Reading Requirements of Military Occupational Specialities. (Alexandria, Virginia and Human Resources Research Organization, March, 1973, 15-17.

Chall, Jeanne S. "This Business of Readability: A Second Look", Educational Research Bulletin, 1956, 35, 89-99 & 111.

Chalmers, P.M. Interpretation of the Test of English as a Foreign Language (TOEFL) Scores. Massachusetts Institute of Technology. Unpublished manuscript, 1964.

Clapper, Thomas H. "Teaching American Government to Foreign Students", Teaching Political Science, 1976, 3, 3, 311-315.

Clark, John L.D. The Performance of Native Speakers of English on the Test of English as a Foreign Language (TOEFL). TOEFL Research Reports, Report 1, Educational Testing Service, Princeton, New Jersey, November, 1977.

Clary, Linda M. "The Nelson-Denny Test in College Reading Programs". U.S. Department of Health Education and Welfare. National Institute of Education, Washington, D.C., 1973.

Cline, T.A. "Readability of Community College Textbooks". Journal of Reading, 1972, 16 & 33-37.

Creamer, W.A. "A Comparison of the Readability of Community College Textbooks with the Students who Use Them". Unpublished manuscript, Gloucester County College, Sewell, New Jersey, 1968.

Cronbach, L.J. Text Material in Modern Education. Urbana, Illinois: University of Illinois Press, 1955.

Dale, Edgar and Chall, Jeanne. "A Formula for Predicting Readability: Instructions". Educational Research Bulletin, 1948, 27, 37-54.

Darnell, Donald K. "The Development of an English Language Proficiency Test of Foreign Students, Using a Clozentropy Procedure." U.S. Department of H.E.W., October, 1968.

Domino, G. Academic achievement and English proficiency of foreign students as predicted by the Test of English as a Foreign Language. Fordham University, unpublished manuscript, 1966.

Educational Testing Service. Comparison of the Test of English as a Foreign Language (TOEFL) Scores and university ratings at four U.S. institutions. ETS, Unpublished manuscript, November, 1965.

Educational Testing Service. Correlations among Test of English as a Foreign Language (TOEFL), American Language Institute (NYU) Test of Proficiency in English, and Michigan Test of English Language Proficiency. ETS, Unpublished manuscript, July, 1966.

Educational Testing Service. Test of English as a Foreign Language (TOEFL) Manual. ETS, Princeton, New Jersey, 1978.

Educational Testing Service. Test of English as a Foreign Language (TOEFL) Workbook. ETS, Princeton, New Jersey, 1980.

Eskey, D. "Advanced Reading: The Structural Problem", English Teaching, Forum, Washington, D.C., 1975, 13, 3-4.

Flesch, Rudolf. "A New Readability Yardstick", Journal of Applied Psychology, 1948, 32, 221-233.

Fry, Edward B. "A Readability Formula That Saves Time", Journal of Reading, 1968, 11, 513-516, 575-578.

Gibson, W.D. "Relationship Between Difficulty Levels of Assigned English Texts and Reading Ability of Community College Students". Dissertation Abstracts International, June, 1971, 31.

Goodman, Kenneth S. "Is the Linguistic Approach an Improvement in Reading Instruction?" A paper presented at the International Reading Association Convention, Boston, Massachusetts, April 27, 1968.

Gue, Leslie and Holdaway, Ed. "English Proficiency Tests as Predictors of Success in Graduate Studies in Education". Language Learning, 1973, 23, 1, 89-103.

Hagstrom, J.M. "A Comparison of the Reading Abilities of Junior College Occupational Education Populations and the Readability Levels of their Texts". California State Department of Education, Sacramento, Research Coordination Unit, Office of Education, Washington, D.C., 1974.

Hagstrom, J.M. "A Comparison of the Reading Abilities of a Junior College Population and the Readability Levels of their Textbooks". Paper presented at the meeting of the Western College Reading Association, Los Angeles, California, April 1-3, 1971.

Harris, Albert and Sipay, Edward. How to Increase Reading Ability. McKay Company, Inc., New York, 1976.

Harris, Theodore L. "Making Reading an Effective Instrument of Learning in the Content Fields", Reading in the High School and College, Forty-Seventh Yearbook of the National Society for the Study of Education, Part II, Chicago: The University of Chicago Press, 1948, 129.

Helwig, J.T. SAS Introductory Guide. Raleigh, North Carolina: SAS Institute Inc., 1978.

Herber, Harold. Teaching Reading in Content Areas. Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1968, 1-26.

Hill, Walter. "Content Textbook: Help or Hindrance?" Journal of Reading, 1967, 10, 408-410.

Hill, Walter. Secondary School Reading: Process, Program, and Procedure. Allyn and Bacon, Inc., Boston, Massachusetts, 1979.

Hittleman, Daniel R. "Seeking a Psycholinguistic Definition of Readability", The Reading Teacher, 1973, 26, 783-789.

Hopkins, Charles R., and Kim, Paul Y. "Textbook Reading Levels", Business Education Forum, 1974, 28, 38-40.

Jefferson, George L. Jr. "Lexical and Structural Items as Predictions of Readability for High and Low Ability Readers". Unpublished doctoral dissertation, University of Georgia, 1969.

Jelinek, J.J. Systems of State Textbook Adoptions. Arizona: Department of Public Instruction, State of Arizona, 1956.

Johnson, Marjorie S., and Kress, Roy A. Informal Reading Inventories. Newark, Delaware, International Reading Association, 1965, 7-9.

Kerlinger, Fred H. Foundations of Behavioral Research. 2nd ed., New York: Holt, Rinehart and Winston, Inc., 1973.

Kingston, Albert J., and Weaver, Wendell W. "Recent Developments in Readability Appraisal." Journal of Reading, 1967, 11, 44-47.

Klare, George R. The Measurement of Readability. Ames, Iowa: Iowa State University Press, 1963.

Koenke, Karl. "Another Practical Note on Readability Formulas." Journal of Reading, 1971, 15, 203-208.

Koops, J.B. Recent practices in teaching writing - A critical examination of junior and senior high school composition texts. Doctoral dissertation, University of Michigan, 1975.

Kurzman, M. "The Reading Ability of College Freshmen Compared to the Readability of their Textbooks", Reading Improvement, 1974, 11, 13-25.

Lee, W.D. and Belden, B.R. "A Cross Validation Readability Study of General Psychology Textbook Material and the Dale-Chall Readability Formula", Journal of Educational Research, 1966, 59, 396-372.

Lehmann, Irvin J. and Mehrens, William A., eds., Educational Research: Readings in Focus. New York: Holt, Rinehart and Winston, Inc., 1971.

Levin, Bernard. "The Nelson-Denny Reading Test as a Predictor of Community College English and Psychology Grades". International Reading Association, Newark, Delaware, June, 1976.

Lively, Bertha A. and Pressey, S.L. "A Method for Measuring the Vocabulary Burden of Textbooks", Educational Administration and Supervision, 1923, 9, 389-398.

Lynch, J.J. and Evans, B. High School English Textbooks. Boston: Atlantic Monthly Press, 1963.

Major, A.G. and Collette, A.T. "Readability of College General Biology Textbooks", Science Education, 1961, 45, 216-224.

Martin, M. and Lee, W. "Sample Frequency of Application of Dale-Chall Readability Formula", Educational Research Bulletin, 1971, 40, 146-149.

Martin, Marvis. "Refinement of a Readability Formula", Problems, Programs, and Projects in College-Adult Reading, Eleventh Yearbook of the International Reading Conference, Milwaukee, Wisconsin: The National Reading Conference, Inc., 1962.

Martin, P.B. "Freshmen Reading Ability: Fall 1967 - Day Session, Nelson-Denny Reading Test", New York City Community College, New York, 1967.

Maxwell, A. A Comparison of Two Tests of English as a Foreign Language. University of California, Davis. Unpublished manuscript, 1965.

McClellan, D.A. "A Comparison of Reading Ability of Junior College Students With the Readability Levels of Assigned Texts". Paper presented at the National Reading Conference, St. Petersburg, Florida, December 3-5, 1970.

McClellan, Dorinda A. "Reading Ability of Junior College Students and Readability of Assigned Texts". Twentieth Yearbook of National Reading Conference, F.P. Greene, Ed., Milwaukee, Wisconsin: 1971, 348-353.

McKenna, Michael. "Synonymic Versus Verbatim Scoring of the Cloze Procedure", Journal of Reading, 1976, 20, 2, 141-143.

Michaelis, John U. and Tyler, Fred T. "A Comparison of Reading Ability and Readability", The Journal of Educational Psychology, 1951, 42, 491.

Miller, G.R. and Coleman, E.B. "A Set of 36 Prose Passages Calibrated for Complexity", Journal of Verbal Learning and Verbal Behavior, 1967, 6, 851-854.

Nelson, M.J. and Denny, E.C. "Your Personal Record on the Nelson-Denny Reading Test". Test Editorial Office, Houghton Mifflin Company: Boston, Massachusetts, 1965.

Nie, Norman; Hull, Hadlai; Jenkins, Jean G.; Steinbrenner, Karin; and Bent, Dale H. Statistical Package for the Social Sciences, 2nd edition, New York: McGraw-Hill Book Company, 1975, 186-193, 281-287.

O'Brien, Donald. "An Investigation of Relationships Existing Between Cloze Form Measures of Reading Comprehension and Behavior Determined by the Reading Inventory Technique and Standardized Reading Tests". Doctoral dissertation, State University of New York at Buffalo, 1973.

Oller, John W., Jr. and Conrad, Christine. "The Cloze Technique and ESL Proficiency", Language Learning, 1971, 21, 183-196.

Oller, John W., Jr. "Scoring Methods and Difficulty Levels for Cloze Tests of ESL Proficiency", Modern Language Journal, 1972, 56, 151-158.

Orr, David B. "The Nelson-Denny Reading Test". In Buros, O.K. (Ed.). The Sixth Mental Measurement Yearbook. Highland Park, New Jersey: Gryphon Press, 1965.

Pike, Lewis W. "An Evaluation of Alternative Items Formats for Testing English as a Foreign Language". Project Report, Educational Testing Service, Princeton, New Jersey, 1974.

Pitcher, B. and Ra, J.B. "The Relation Between Scores on the Test of English as a Foreign Language and Ratings of Actual Theme Writing". Statistical Report 67-9, Princeton, New Jersey: ETS, 1967.

Powers, R.D., et al. "A Recalculation of Four Readability Formulas", Journal of Educational Psychology, 1958, 49.

Powers, R.D., Sumner, W.A., and Kearl, B.E. "A Recalculation of Four Adult Readability Formulas", Journal of Educational Psychology, 1958, 49, 99.

Rand Corporation, A Million Random Digits with 100,000 Normal Deviates, The Free Press, Glencoe, Illinois, 1955, 99-100. In Minium, Edward W. Statistical Reasoning in Psychology and Education, 2nd edition, New York: John Wiley & Sons, 1978.

Rankin, E.F. and Culhane, J. "Comparable Cloze and Multiple-Choice Comprehension Test Scores", Journal of Reading, 1969, 13, 193-198.

Senter, R.J. Analysis of Data: Introductory Statistics for the Behavioral Sciences. New Jersey: Scott, Foresman and Company, 1969, 190.

Sharon, Amiel T. "English Proficiency, Verbal Aptitude, and Foreign Student Success in American Graduate Schools", Educational and Psychological Measurement, 1972, 32, 425-431.

Taylor, Wilson L. "Recent Developments in the Use of 'Cloze Procedures'", Journalism Quarterly, 1956, 33, 42-48.

Taylor, W.L. "Cloze Procedure: A New Tool for Measuring Readability", Journalism Quarterly, 1953, 30, 414-438.

Tibbetts, Sylvia-Lee. "How Much Should We Expect Readability Formulas to Do?", Elementary English, 1973, 50, 75.

Thorndike, Edward L. A Teacher's Word Book of Twenty Thousand Words. New York: Teachers College, Columbia University, 1931.

University of Washington. Foreign Student Study. Unpublished manuscript, 1966.

Upshur, J.A. "Comparison of Performance on the Test of English as a Foreign Language and the Michigan Test of English Language Proficiency". University of Michigan. Unpublished manuscript, 1966.

Weintraub, Samuel. "Research: Reading and Textbooks", Journal of Reading, 1967, 21, 283-285.

APPENDIX A

DESCRIPTION, APPLICATION AND SCORING OF THE DALE-CHALL READABILITY FORMULA

THE DALE-CHALL READABILITY FORMULA

AS CONSTRUCTED BY

EDGAR DALE AND JEANNE S. CHALL 1948

I. Selecting Samples:
Take approximately 100 words about every tenth page for books. For articles, select about four 100-word samples per 2,000 words. Space these samples evenly. For passages of about 200 to 300 words, analyze the entire passage. Never begin or end in the middle of a sentence.

II. Labeling Work Sheet:
Enter such information as title, author, publisher, date of publication, etc., regarding the sample to be appraised.

III. Counting the Number of Words:
- A. Count the total number of words in the sample.
- B. Count hyphenated words and contractions as one word.
- C. Count numbers as words. 10 is one word.
- D. Count compound names of persons and places as one word.
- E. Do not count initials which are part of a name as separate words. John W. St. John is counted as two words.
- F. Record the number of words under No. 1 of the work sheet.

IV. Counting the Number of Sentences:
- A. Count the number of complete sentences in the sample.
- B. Record this under No. 2 of the work sheet.

V. Counting the number of unfamiliar words:
Words which do not appear on the Dale List are considered unfamiliar. Underline all unfamiliar words, even if they appear more than once.

In making this count, special rules are necessary for common and proper nouns, verbs, and other parts of speech. These are given in the section which follows:

A. Common Nouns:
1. Consider familiar all regular plurals and possessives of words on the list.
2. Count irregular plurals as unfamiliar, even if the singular form appears on this list.
3. Count as unfamiliar a noun that is formed by adding er or r to a noun or verb appearing on the word list (unless this er or r form is indicated on the list).

B. Proper Nouns:
1. Names of persons and places are considered familiar.
2. Names of organizations, laws, documents, titles of books, movies, and so on generally comprise several words.

a. When determining the number of words in a sample, count all the words in the name of an organization, law and the like.
b. For the unfamiliar word count, consider unfamiliar only words which do not appear on the Dale List, except the names of persons and places.

3. Abbreviations:
   a. In counting the words in a sample, an abbreviation is counted as one word.
   b. In making the unfamiliar word count, an abbreviation is counted as one unfamiliar word only.

C. Verbs
1. Consider familiar the third-person, singular forms (s or IES from Y), present-participle forms (ing), past-participle forms (n), and past-tense forms (ed or ied from y), when these are added to verbs appearing on the list. The same rule applies when a consonant is doubled before adding ing or ed.

D. Adjectives:
1. Comparative and superlatives of adjectives appearing on the list are considered familiar. The same rule applies if the consonant is doubled before adding er or est.
2. Adjectives formed by adding n to a proper noun are familiar.
3. Count as unfamiliar an adjective that is formed by adding y to a word that appears on the list. But consider the word familiar if y appears in parentheses following the word.

E. Adverbs:
1. Consider adverbs familiar which are formed by adding ly to a word on the list. In most cases ly will be indicated following the word.
2. Count as unfamiliar words which add more than ly.

F. Hyphenated Words and Compounds:
Count hyphenated words as unfamiliar if either word in the compound does not appear on the word list. When both appear on the list, the word is familiar.

G. Miscellaneous Special Cases:
1. Words formed by adding en to a word on the list (unless it appears on the list) are considered familiar.
2. Count a word unfamiliar if two or more endings are added to a word on the list.
3. Words on the list to which -tion, -ation, -ment, and other suffixes not previously mentioned are added and considered unfamiliar, unless the with the ending in included on the list.
4. Numbers: Numerals like 1947 are considered familiar.

H. Record the total number of unfamiliar words under No. 3 of the work sheet.

Completing the Work Sheet:

1. The average sentence length (No. 4) is computed by dividing the number of words in the sample by the number of sentences in the sample.
2. The Dale score or percentage of words outside the Dale list is computed by dividing the number of words not on the Dale list by the number of words in the sample, and multiplying by 100.
3. Follow through Steps 6 and 7 on the work sheet.
4. Add Nos. 6, 7, and 8 to get the formula raw score.
5. If you have more than one sample to analyze, get an average of the formula raw scores by adding all of these and dividing by the number of samples.
6. Convert the average formula raw score to a corrected grade-level according to the Correction Table given.

The corrected grade-level indicates the grade at which a book or article can be read with understanding. For example, a book with a corrected grade-level of 7-8 is one which should be within the reading ability of average children in Grades VII and VIII. The corrected grade-levels corresponding to the raw scores obtained from the formula are given in Table 1. These will serve to determine the grade-level of materials being appraised with the use of the Dale list.

TABLE 14

Correction Table

Formula Raw Score	Corrected Grade-Levels
4.9 and below. . .	4th grade and below
5.0 to 5.9. . .	5 - 6th grade
6.0 to 6.9. . .	7 - 8th grade
7.0 to 7.9. . .	9 - 10th grade
8.0 to 8.9. . .	11 - 12th grade
9.0 to 9.9. . .	13 - 15th grade (college)
10.0 and above. . .	16 - (college graduate)

APPENDIX B

ADMISSION RECOMMENDATIONS AND GUIDELINES FOR USE OF THE TEST OF ENGLISH AS A FOREIGN LANGUAGE

TEST OF ENGLISH AS A FOREIGN LANGUAGE

Using TOEFL Scores in University Admissions

TOEFL is a measure of English proficiency. It is not a test of academic aptitude or of subject matter competence. Therefore, admissions decisions regarding international candidates should not be based exclusively on TOEFL test scores but rather on academic qualifications and a variety of other factors, including but not limited to English language proficiency. The admissions officer's decision should not be based on TOEFL scores alone, since these scores simply indicate the relative position of an applicant compared to all other TOEFL applicants. It cannot be inferred from the scores themselves that an applicant has the English language skill necessary for successful performance in a particular situation at a particular institution.

Admissions Recommendations Relative to TOEFL Scores

In 1977, the TOEFL program staff surveyed a number of colleges and universities that require the TOEFL to determine the ranges on the score scale below which scores were considered inadequate for satisfying admission requirement. The recommended admissions policies below are based on the assumption that individual applicants meet the academic requirements of the programs for which they are applying.

Score Range	Recommended Policy
550 and above	Admit with no restrictions at both graduate and undergraduate levels. Exceptions: 1. Applicants with significantly lower scores in one test section may require supplementary work in English to develop their skills in this area. 2. Graduate students in fields such as journalism, which require near-native proficiency in English, should have total scores of at least 600 for unrestricted programs of study in these subjects.

500 - 549	Admit with no restrictions graduate students in highly technical fields, such as mathematics, chemistry, physics, and engineering. Other students may be admitted but with initial limitations on academic load and with supplementary instruction in English for at least the first term.
450 - 499	Admit if strong in all aspects of application other than English proficiency. Individual cases should be reviewed, with consideration given to field of study and TOEFL section scores. Applicants scoring in this range generally require a significant amount of English instruction (perhaps half time) with a corresponding reduction in normal course load.
Below 450	Readiness to begin studies doubtful. Applicants scoring in this range generally require a full-time program in English before embarking on even a limited academic program.

Guidelines for Using TOEFL Scores

A. Consider section scores as well as total scores in making admissions decisions. The total score on TOEFL is based on the three sections of the test. While a number of applicants may achieve the same total score, they may have different section scores, which should be considered in admissions decisions. For example, an applicant with a low score on the listening comprehension section of the test, but relatively high scores on the other sections, may have difficulty in lecture courses.

If an applicant's score on the structure and written expression section is considerably lower than the scores on other sections, it may be that the individual should take a reduced academic load and be assigned additional work designed to improve his or her writing skills. Similar considerations should apply if someone's reading and vocabulary section score is much lower than the scores on the other two sections.

B. In arriving at a decision concerning the competency in English of an international applicant, give consideration to the different kinds and levels of proficiency required in different fields and levels of study and to the resources available at the institution for developing the English language skills of international applicants.

In general, institutions that offer courses in English for international students and are willing to modify initial course loads can safely accept applicants with lower TOEFL scores than can institutions that have no such courses and expect applicants to pursue regular programs of study.

As indicated earlier, a distinction should be made between graduate and undergraduate applicants. In most fields, the length of study, the range of required courses, and the degree of English proficiency required for successful academic study are different for the two groups of students.

C. Do not use rigid "cut off" scores in screening international applicants. Since test scores are not perfect measures of a person's ability, the use of rigid cut off scores should be avoided. The standard error of measurement should be taken into consideration in making decisions about individuals in or near the critical score ranges.

The above information was extracted from the Educational Testing Service's TOEFL Manual of 1978.

APPENDIX C

ADMISSION POLICY FOR INTERNATIONAL STUDENTS

ADMISSIONS POLICY

This Southwestern state university has established a set of standards, as specified in its handbook for international students of which applicants from other countries must meet so that "those admitted will be prepared to take full advantage of the opportunities offered them and to make a positive contribution to the academic and social life on the campus" (University of Oklahoma, Information Bulletin for International Students). To be admitted to the university a student must demonstrate:

1. A high scholastic achievement.
2. An adequate command of the English language.
3. Ability to finance his/her education.

Scholastic Achievement

Admission to the primary year of the university is partially based on an adequate secondary school record as demonstrated by a recognized certificate of completion. The quality of the candidates work is judged from the grades, class or division obtained. Minimum passing or average performance is not sufficient for admission to the university. "Experience has shown that only those who have earned high grades in school subjects and/or in the examinations given by the Ministry of Education or a similar agency where national examinations are available can expect to successfully complete degree programs at the university." The handbook continues by advising those students who have not attained the standards specified to make application to an accredited junior college.

Knowledge of English

"Since all lectures, /textbooks and resource materials/, laboratory sections, and written or oral examinations at the /university/ are conducted in

English, it is essential that /the applicant/ have a high degree of fluency in the language before seeking admission."

An applicant for admission from another country is required to take the TOEFL, a test administered and scored every three months by the Educational Testing Service, Princeton, New Jersey.

Financial Adequacy

Each student is required to meet all financial expenditures at the beginning of each semester without any assistance from the university. The student must submit a certification of financial standing to determine the advisability of issuing to that student a Form I-20 (Certificate of Eligibility approved by the Office of the Attorney General of the United States).

APPENDIX D

CLOZE TESTS ADMINISTERED

Construction of Cloze Tests

Passages selected for use in constructing the cloze tests that were utilized in this study represented the upper one-third reading difficulty level of all those passages (analyzed by the Dale-Chall Readability Formula) in textbooks sampled for that particular area. For example, the General cloze test was constructed from a passage that represented the upper one-third reading difficulty level (as determined by the Dale-Chall Readability Formula) of all the passages sampled from the general core course textbooks (see Appendix E). Selection of a reading passage for use in constructing a cloze test for Non-science majors and Science majors followed the same procedure.

Once the passage is selected every fifth word is then deleted, leaving a ten space blank after every fourth word. For additional information concerning cloze reading difficulty levels and cloze test blanks, see Table 15.

TABLE 15

Cloze Test	Dale Score Upper 1/3 Level	Actual Dale Score of Passage	Dale-Chall Grade Level	Total Number Words in Passage	Total Cloze Blanks
General (Political Science)	8.89	8.86	11-12	340w	68
Non-Science (Journalism)	8.90	8.83	11-12	297w	59
Science (Engineering)	9.96	9.93	13-15	321w	64

General Cloze Test - Political Science

We tend to think _____ civil liberties, and the _____ of Rights generally, as _____ of such weighty philosophical _____ as to be radically _____ from "ordinary" political issues. _____ fact is, however, that _____ of civil liberties come the fore in much _____ the same way as any _____ issue: people disagree over _____ ought to be done, _____ how it ought to _____ done, and they fight _____ their disagreement by enlisting _____ support of various parts _____ the government. One person _____ a trial free of _____; another person wants to _____ newspaper stories without interference. _____ group wishes to live _____ a community free of _____ loudspeakers or pornographic bookstores; _____ group wants to broadcast _____ those loudspeakers or patronize _____ bookstores. In these cases _____ group politics occurs. The _____ groups could take their _____ to the legislative, and _____ they do, but they _____ can take it (and _____ do) to the courts.

Minorities _____ unusual or extreme political _____ religious beliefs are usually _____, at least by law _____ not by the customs _____ the people. But on _____, especially in times of _____ crises, intense (though usually _____) majorities are mobilized against _____ groups, and new laws _____ passed restricting their behavior _____ better or for worse. _____ is often a case _____ entrepreneurial politics. The affected _____ , or a group speaking _____ its behalf, asks the _____ to overrule the legislature.

_____ resolution of these issues _____ the courts is political, _____ the sense that differing _____ about what is right _____ desirable compete, with one _____ or another prevailing (often _____ a small majority). In _____ competition of ideas, federal _____, though not elected, are _____ of and often keenly _____ to strong currents of opinion. When entrepreneurial politics _____ produced new action against _____ threatening minorities, judges are _____, at least for a _____, to give serious consideration _____ popular fears and legislative _____. And when no strong _____ mood is discernible, the _____ of elites influence judicial _____.

Name _____

I.D. _____

Score _____

James Q. Wilson. American Government: Institutions and Politics. Massachusetts: D.C. Heath and Company, 1980, 506.

Content Cloze Test - Non-Science - Journalism

As long as people _____ interests to achieve or _____ to sell, they will _____ them upon buyers. Persuasive _____ exist for all sorts _____ ends -- to get Congress _____ enact a bill which _____ unselfish sponsors sincerely believe _____ lead to world peace; achieve safety on the _____; to prohibit the sale _____ alcoholic beverages; to raise _____ wages; to establish free _____ medical care; to sell _____ insurance, automobiles, education, or _____. Each group believes that _____ goals are legitimate and _____.

Here another ethical problem _____ persuasion. A good end _____ be held to justify _____ bad means. To use _____ fantastic example, the hope _____ enacting a world peace _____ would not justify bribery, _____, and deception to obtain _____ passage (although some of _____ sponsors might feel that _____ did). Public relations, like _____ itself, is a way _____ achieving agreement through understanding _____ persuasion. The way is _____ as important as the _____ sought at any particular _____ by fallible human beings; _____ indeed it may be _____ important, because democracy lives _____ the road it travels.

_____, half-truths, concealed support, personal _____, false appeals to unworthy _____, smears upon personal or _____ integrity are all bad _____ -- bad, because their employment _____ the confidence between men, is the basis of _____ freedom. Their use is _____ and irresponsible and injuries _____

public welfare, which sustains _____ every form of government. _____ have within them seeds _____ hatred, internal warfare, and _____.

The power of free _____ is great, and with _____ power goes great responsibility. _____ relations people must not _____ persuade fairly, but they _____ also guide themselves by _____ they feel is best _____ the public welfare as _____ honest, intelligent, well-informed person _____ see it.

Name _____

I.D. _____

Score _____

John E. Marston. Modern Public Relations. New York: McGraw-Hill Book Company, 1979, 453.

Content Cloze Test - Science - Engineering

We will not consider _____ of obtaining and presenting _____ response of a circuit _____ sinusoidal excitation as a _____ of the radian frequency w. _____ the possible exception and _____ 60-Hz power area in which _____ is a constant and _____ load is the variable, _____ frequency response is extremely _____ in almost every branch _____ electrical engineering as well _____ in related areas, such _____ the theory of mechanical _____.

Let us suppose that _____ have a circuit which _____ excited by a single $V_s = V_s/\underline{0}$. This phasor voltage may _____ be transformed into the _____ source voltage $V_s \cos(wt + 0)$. Somewhere in _____ circuit exits the desired _____, say, a current I. As _____ know, this phasor response _____ a complex number, and _____ value cannot be specified _____ general without the use _____ two quantities: either a _____ part and an imaginary _____, or a magnitude and phase angle. The latter _____ of quantities is more _____ and more easily determined _____, and it is the _____ which we shall obtain _____ as a function of _____. The data may be _____ as two curves, the _____ of the response as _____ function of w and the _____ angle of the response _____ a function of w. We _____ normalize the curves by _____ the magnitude of the _____ ratio and the phase _____ of the current-voltage ratio _____ w. It is evident that _____ alternative description of the _____ curves is the magnitude _____ phase angle of an _____ as a function of _____.

The admittance might be _____ input admittance or, if _____ current and voltage are _____ at different locations in _____ circuit, a transfer admittance. _____ normalized voltage response to _____ current source may be _____ presented as the magnitude _____ phase angle of an _____ or transfer impedance versus w. _____ possibilities are voltage-voltage ratios (_____ gains) or current-current ratios (_____ gains).

Name _____

I.D. _____

Score _____

William H. Hayt Jr. and Jack E. Kemmerly. Engineering Circuit Analysis. New York: McGraw-Hill Book Company, 1978, 317.

APPENDIX E

SAMPLING AND DALE-CHALL READABILITY

RESULTS OF TEXTBOOKS

Sampling and Dale-Chall Readability Results of Textbooks

This Appendix includes pertinent information concerning the reading difficulty of selected college textbooks at the University of Oklahoma. The textbooks analyzed by the Dale-Chall Readability Formula were placed into one of three categories: General, Non-Science (Journalism), and Science (Engineering).

For the General Core courses, the following textbooks were analyzed:

Course	Textbook
English 1113	Randall E. Decker. Patterns of Exposition 6. Boston, Massachusetts: Little, Brown and Company, 1978, 1-338.
English 1113	Donald McQuade and Robert Atwan. Thinking in Writing: Structures for Composition. New York: Alfred A. Knopf, Inc., 1980, 1-473.
English 1113	Robert G. Bander. American English Rhetoric: A Writing Program in English as a Second Language. Second ed., New York: Holt, Rinehart and Winston, 1978, 1-332.
History 1483	Norman Crockett and Ronald Snell. A New Order in the World: Readings in American History. 1607-1861. Norman, Oklahoma: University of Oklahoma Press, 1979, 3-302.
History 1493	John A. Garraty. The American Nation: A History of the United States Since 1865. Fourth ed., Vol. 2, New York: Harper and Row, Publishers, 1979, 393-816.
Political Science 1113	James Q. Wilson. American Government: Institutions and Policies. Massachusetts: D.C. Heath and Company, 1980, 2-632.
Political Science 1113	Thomas R. Dye and L. Harmon Zeigler. The Irony of Democracy: An Uncommon Introduction to American Politics. Fourth ed., Massachusetts: Duxbury Press, 1978, 1-413.

Political Science 1113	Peter Woll. Behind the Scenes in American Government: Personalities and Politics. Second ed., Boston, Massachusetts: Little, Brown and Company, 1979, 1-326.

Of the General Core course textbooks that were selected and analyzed in this study, the results were computed and presented in Table 16. In addition to the Table, a sample of the Dale-Chall Readability Formula analysis procedures for General Core course textbooks is demonstrated.

For the Non-Science courses, the following Journalism textbooks were analyzed:

Course	Textbook
Journalism 2033	George A. Hough. News Writing. Second ed., Boston, Massachusetts: Houghton Mifflin, 1980, 1-417.
Journalism 2623	Peter B. Orlik. Broadcast Copywriting. Boston, Massachusetts: Allyn and Bacon, Inc., 1978, 3-434.
Journalism 2713	David H. Curl. Photocommunication: A Guide to Creative Photography. New York: Macmillan Publishing Company, Inc., 1979, 1-268.
Journalism 3003	Floyd K. Baskette and Jack Z. Sissors. The Art of Editing. Second ed., New York: Macmillan Publishing Company, Inc., 1977, 1-438.
Journalism 3353	Sandra Ernst. The Creative Package: A Working Text for Advertising Copy and Layout. Columbus, Ohio: Grid Inc., 1979, 14-139.
Journalism 3413	John E. Marston. Modern Public Relations. New York: McGraw-Hill Book Company, 1979, 3-489.
Journalism 4403	Allen H. Center and Frank E. Walsh. Public Relations Practices: Case Studies. Second ed., New Jersey: Prentice-Hall, Inc., 1981, 1-346.
Journalism 4613	Frank J. Kahn. Documents of American Broadcasting. Third ed., New Jersey: Prentice-Hall, Inc., 1978, 1-593.
Journalism 4803	Edwin Emery and Michael Emery. The Press and America: An Interpretive History of the Mass Media. Fourth ed., New Jersey: Prentice-Hall, Inc., 1978, 2-548.

Of the Journalism course textbooks that were selected and analyzed in this study, the results were computed and presented in Table 17. In addition to the table, a sample of the Dale-Chall Readability Formula analysis procedures for Journalism textbooks is demonstrated. For the Science courses, the following Engineering textbooks were analyzed:

Course	Textbook
Engineering 1213	Frederick E. Giesecke, Alva Mitchell, Henry Cecil Spencer, Ivan Leroy Hill, and John Thomas Dygdon. Technical Drawing. Seventh ed., New York: Macmillan Publishing Company, Inc., 1980, 1-792.
Engineering 2113	J.L. Meriam. Engineering Mechanics Statics and Dynamics. New York: John Wiley and Son, 1978, 1-347, 3-466.
Engineering 2613	William H. Hayt, Jr. and Jack E. Kemmerly. Engineering Circuit Analysis. New York: McGraw-Hill Book Company, 1978, 3-741.
Engineering 3213	Gordon J. Van Wylen and Richard E. Sonntag. Fundamentals of Classical Thermodynamics SI Version. Second ed., New York: John Wiley and Sons, 1976, 1-643.
Engineering 3223	John A. Roberson and Clayton T. Crowe. Engineering Fluid Mechanics. Second ed., Boston, Massachusetts: Houghton Mifflin Company, 1980, 4-630.
Engineering 3293	Van Vlack. Elements of Materials Science and Engineering. Fourth ed., Reading, Massachusetts: Addison-Wesley Publishing Company, 1980, 1-516.
Engineering 4223	Gerald Smith. Engineering Economy: Analysis of Capital Expenditures, Third ed., Ames, Iowa: The Iowa State University Press, 1979, 1-472.

Of the Engineering course textbooks that were selected and analyzed in this study, the results were computed and presented in Table 18. In addition to the Table, a sample of the Dale-Chall Readability Formula analysis procedures for Engineering textbooks is demonstrated.

TABLE 16

General Core Courses

Course		Total Dale Raw Score	Pages	Average Dale Raw Score
English	1113	60.298	7	8.614
English	1113	69.201	9	7.689
English	1113	54.586	7	7.798
History	1483	76.022	9	8.447
History	1493	66.100	7	9.443
Political Science	1113	119.229	13	9.172
Political Science	1113	78.984	8	9.873
Political Science	1113	50.526	7	7.218

Sample of texts 8. Average corrected grade level 11-12th grade.

Grade level ranges of English textbooks sampled 9-12th grade.

Grade level ranges from samples of English textbooks 5-16th grade.

Grade level ranges of History textbooks sampled 11-15th grade.

Grade level ranges from samples of History textbooks 9-16th grade.

Grade level ranges of Political Science textbooks sampled 9-15thgrade.

Grade level ranges from samples of Political Science textbooks 7-16th grade.

Course: English 1113

Text: Randall E. Decker. Patterns of Exposition 6. Boston, Massachusetts: Little, Brown and Company, 1978, 1-338.

Page No.	3	67	123	145	209	251	303
1. Number of words in the sample	101	113	111	115	125	151	111
2. Number of sentences in the sample	5	4	5	6	5	5	4
3. Number of words not on Dale List	32	31	38	13	33	22	23
4. Average sentence length (divide 1 by 2)	20.2	28.3	22.2	19.17	25.0	30.2	27.75
5. Dale score (divide 3 by 1, multiply by 100)	31.68	27.43	34.2	11.3	26.3	14.57	20.72
6. Multiply average sentence length (4) by .0496	1.0	1.40	1.10	.951	1.24	1.498	1.38
7. Multiply Dale score (3) by	.1579	5.0	4.33	5.41	1.78	4.17	2.30
8. Constant	3.6365	3.6365	3.6365	3.6365	3.6365	3.6365	3.6365
9. Formula raw score (add 6, 7, and 8)	9.64	9.37	10.14	6.37	9.05	7.44	8.29

Average raw score of 7 samples. 8.614 Average corrected grade-level 11-12th grade

TABLE 17

Content Courses

Non-Science
Journalism

	Course	Total Dale Raw Score	Pages	Average Dale Raw Score
Journalism	2033	65.340	9	7.260
Journalism	2623	71.735	8	8.967
Journalism	2713	53.920	6	8.987
Journalism	3003	74.844	9	8.316
Journalism	3353	28.590	3	9.530
Journalism	3413	86.700	10	8.670
Journalism	4403	61.858	7	8.837
Journalism	4613	117.981	12	9.832
Journalism	4803	90.420	11	8.220

Sample of texts 9. Average corrected grade level 11-12th grade.

Grade level ranges of Journalism textbooks sampled 9-15th grade.

Grade level ranges from samples of Journalism textbooks 7-16th grade.

Course: Journalism 4403

Text: Allen H. Center and Frank E. Walsh. Public Relations Practices: Case Studies. 2nd ed. New Jersey: Prentice-Hall, Inc., 1981, 1-346.

Page No.	1	62	115	161	205	255	305
1. Number of words in the sample	105	151	113	102	114	118	117
2. Number of sentences in the sample	6	6	5	6	3	5	6
3. Number of words not on the Dale List	26	33	27	29	33	37	23
4. Average sentence length (divide 1 by 2)	17.5	25.2	22.6	17.0	38.0	23.6	19.5
5. Dale score (divide 3 by 1, multiply by 100)	24.8	21.9	23.9	28.4	29.0	31.4	19.7
6. Multiply average sentence length (4) by .0496	.868	1.25	1.12	.84	1.88	1.17	.967
7. Multipy Dale score (3) by	.1579	3.91	3.45	3.77	4.49	4.57	4.95
8. Constant	3.6365	3.6365	3.6365	3.6365	3.6365	3.6365	3.6365
9. Formula raw score (add 6, 7, and 8)	8.41	8.34	8.53	9.02	10.09	9.76	7.71

Average raw score of 7 samples. 8.8368 Average corrected grade-level 11-12th grade

TABLE 18

Content Courses

Science
Engineering

	Course	Total Dale Raw Score	Pages	Average Dale Raw Score
Engineering	1213	133.44	16	8.340
Engineering	2113	177.66	18	9.870
Engineering	2613	151.20	15	10.080
Engineering	3213	127.10	13	9.777
Engineering	3223	124.52	13	9.578
Engineering	3293	110.75	11	10.068
Engineering	4223	100.50	10	10.050

Sample of texts 7. Average corrected grade level 13-15th grade.

Grade level ranges of Engineering textbooks sampled 11-16th grade.

Grade level ranges from samples of Engineering textbooks 7-16th grade.

Course: Engineering 3213

Text: Gordon J. Van Wylen and Richard E. Sonntag. Fundamentals of Classical Thermodynamics SI Version. 2nd ed., New York: John Wiley and Sons, 1976, 1-643.

Page No.	1	46	104	166	202	267	307
1. Number of words in the sample	104	105	118	118	117	119	122
2. Number of senences in the sample	4	5	5	4	4	7	4
3. Number of words not on Dale List	33	32	47	24	37	38	34
4. Average sentence length (divide 1 by 2)	26.0	21.0	23.6	29.5	29.3	17.0	30.5
5. Dale score (divide 3 by 1, multiply by 100)	31.7	30.5	39.8	20.3	31.6	31.9	27.9
6. Multiply average sentence length (4) by .0496	1.29	1.04	1.17	1.46	1.45	.84	1.51
7. Multiply Dale score (3) by	.1579	5.01	4.812	6.289	3.21	4.99	5.04
8. Constant	3.6365	3.6365	3.6365	3.6365	3.6365	3.6365	3.6365
9. Formula raw score (add 6, 7, and 8)	9.936	9.489	11.096	8.31	10.08	9.52	9.55

Average raw score of 13 samples. 9.777 Average corrected grade-level 13-15th grade

Course: Engineering 3213 (Continued)

Text:

Page No.	363	399	463	511	557	618
1. Number of words in the sample	101	122	111	140	126	107
2. Number of sentences in the sample	6	6	5	5	6	4
3. Number of words not on Dale List	41	40	36	38	41	32
4. Average sentence length (divide 1 by 2)	16.8	20.3	22.2	28.0	21.0	26.8
5. Dale score (divide 3 by 1, multiply by 100)	40.6	32.8	32.4	27.1	32.5	29.9
6. Multiply average sentence length (4) by .0496	.835	1.01	1.10	1.39	1.04	1.33
7. Multiply Dale score (3) by .1579	6.41	5.18	5.12	4.29	5.14	4.72
8. Constant	3.6365	3.6365	3.6365	3.6365	3.6365	3.6365
9. Formula raw score (add 6, 7, and 8)	10.88	9.82	9.86	9.32	9.81	9.68

Average raw score of _____ samples. _____ Average corrected grade-level _____.

APPENDIX F

TRAINING OF PANEL OF READING EXPERTS

Training of Panel of Reading Experts

The panel of reading experts was instructed as to the purpose of the study, the use and administration of the Informal Reading Inventory (I.R.I.) and the use of professional judgment.

The I.R.I. is a type of informal reading test designed to help discover the levels of reading materials which students should be able to function based on their ability to comprehend the material. The I.R.I.s of this study contain a series of carefully graded reading selections for all reading levels four through sixteen. The reading passages comprising the I.R.I. were taken from several general and content reading materials, including some textbooks. Passages selected were from the following sources:

1. Baskette, Floyd K. and Jack Z. Sissors. The Art of Editing, Second edition, New York: Macmillan Publishing Company, Inc., 1977, 404.
2. Bischof, George and Eunice. Sun, Earth, and Man. New York: Harcourt, Brace Company, 1957, 15-16.
3. Center, Allen H. and Frank E. Walsh. Public Relations Practices: Case Studies, Second edition, New Jersey: Prentice-Hall, Inc., 1981, 205.
4. Cooper, Elizabeth K. Science in Your Back Yard, New York: Harcourt, Brace and Company, 1958, 29-30.
5. Curl, David H. Photocommunication: A Guide to Creative Photography, New York: Macmillan Publishing Company, 1979, 259.
6. Early, Margaret, Elizabeth K. Cooper, and Nancy Santeusanio. Widening Circles, New York: Harcourt Brace and Company, 1979, 221.
7. Emery, Edwin and Michael. The Press and America: An Interpretative History of the Mass Media. Fourth edition, New Jersey: Prentice-Hall, Inc., 1978, 168.

8. Hough, George A. News Writing, Second edition, Massachusetts: Houghton Mifflin, 1980, 103.

9. Marston, John E. Modern Public Relations. New York: McGraw-Hill Book Company, 1979, 329.

10. Meriam, J. L. Engineering Mechanics Statics and Dynamics, New York: John Wiley and Sons, 1978, 1.

11. Murphy, James T. and Robert C. Smoot. Physics: Principles and Problems. Ohio: Charles E. Merrill Publishing Co., 1977, 38.

12. Orlik, Peter B. Broadcast Copywriting. Massachusetts: Allyn and Bacon, Inc., 1978, 267.

13. Pauk, Walter. Essential Skills: Book II, Rhode Island: Jamestown Publishers, Inc., 1976, 20, 25.

14. _____ Essential Skills: Book 7, Rhode Island: Jamestown Publishers, Inc., 1976, 9, 15.

15. _____ Essential Skills: Book 13, Rhode Island: Jamestown Publishers, Inc., 1976, 19.

16. Sack, Allan, and Jack Yourman. 88 Passages: To Develop Reading Comprehension, New York: College Skills Center, 1975, 33, 40, 73, 5, 16, 28, 49, 56, 61, 69, 79, 83.

17. _____ 66 Passages: To Learn to Read Better, New York: College Skills Center, 1977, 37, 53, 34, 24.

18. Smith, Carl B. and Ronald Wardhaugh. Beginnings and Endings: Teacher's ed., New York: Macmillan Publishing Co., Inc., 1975, 120-123.

19. _____ Cycles, Impressions and a Visit with Rosalind, Teacher's ed., New York: Macmillan Publishing Co., Inc., 1975, 137-139

20. _____ Stand Tall and a Second Look, Teacher's ed., New York: Macmillan Publishing Co., Inc., 1975, 86-87, 161-162.

21. Smith, Gerald. Engineering Economy: Analysis of Capital Expenditures, Third ed., Iowa: The Iowa State University Press, 1979, 105.

22. Smith, Nila Banton. Be a Better Reader: Book A, New Jersey: Prentice-Hall, Inc., 1968, 34, 114, 47.

23. _____ Book B, New Jersey: Prentice-Hall, Inc., 1968, 88.

24. _____ Book C, New Jersey: Prentice-Hall, Inc., 1968, 159.

25. _____ Book I, New Jersey: Prentice-Hall, Inc., 1968, 53.

26. _____ Book III, New Jersey: Prentice-Hall, Inc., 1968, 102.

27. _____ Book IV, New Jersey: Prentice-Hall, Inc., 1968, 127.

28. _____ Book VI, New Jersey: Prentice-Hall, Inc., 1968, 166-167.

29. Van Vlack. Elements of Materials Science and Engineering, Fourth ed., Massachusetts: Addison-Wesley Publishing Co., 1980, 500.

30. Van Wylen, Gordon and Richard E. Sonntag. Fundamentals of Classical Thermodynamics SI Version, Second ed., New York: John Wiley and Sons, 1976, 166.

31. Wilson, James Q. American Government Institutions and Policies, Massachusetts: D.C. Heath and Co., 1980, 406, 608.

Each passage was between 280 and 370 words in length and checked for difficulty by the researcher by using the Fry and Flesch Readability Formulas or the Dale-Chall Readability Formula. Following each selection was a group of questions written by the researcher that were designed to measure many types of comprehension skills. The following types of questions were suggested by Valmont (1972) and used:

1. A main idea question asks for the central theme of the selection.
2. A detail question asks for bits of information directly stated in the material.
3. A sequence question requires knowledge of events in their order of occurance.
4. A cause-and-effect question [illegible] asks for its effect or mentions an effect
5. An inference [illegible] not directly sta
6. A vocab [illegible] in the s

The panel [illegible] was determined [illegible] students' approx [illegible] silently each sele [illegible] own answers in th [illegible] istering the I.R.I.S. A [illegible] determined if the stu [illegible] member determined the s [illegible] reworded the question or asked a [illegible] judgment was rendered as to the student's knowledge of what was read. Based on the student's responses to the questions, the panel member determined if the student could comprehend the passage with 75 percent comprehension or better, as determined by Johnson and Kress (1965). If a student was found to be reading competently,

1. A main idea question asks for the central theme of the selection.
2. A detail question asks for bits of information directly stated in the material.
3. A sequence question requires knowledge of events in their order of occurance.
4. A cause-and-effect question names a cause and asks for its effect or mentions an effect and asks for its cause.
5. An inference question asks for information that is implied, but not directly stated in the passage.
6. A vocabulary question asks for the meaning of a word or phrase used in the selection.

The panel member used those reading passages whose reading difficulty was determined by the Fry and Flesch Readability Formulas as determiners of students' approximate reading level. The international student was to read silently each selection and respond to the corresponding questions by writing his own answers in the space provided. There was no time limit set for administering the I.R.I.s. After the student phrased his answer, the panel member then determined if the student answered each question adequately. If the panel member determined the student's response to a question to be vague, he reworded the question or asked additional questions orally until a judgment was rendered as to the student's knowledge of what was read. Based on the student's responses to the questions, the panel member determined if the student could comprehend the passage with 75 percent comprehension or better, as determined by Johnson and Kress (1965). If a student was found to be reading competently,

that is, able to read with 75 percent comprehension or better, then he was directed to read more difficult passages until his comprehension level fell below the 75 percent competency level on two consecutive passages. At this point, the panel member then terminated that portion of the testing session and determined the student's approximate reading level. To arrive at a more exact reading grade level, the passages whose reading difficulty was determined by the Dale-Chall Readability Formula were employed. The same procedure was followed as with the previous passages to determine both content and general reading levels of the student to the nearest grade level.

Based on students' ability to understand the I.R.I. passages and the use of the panel members' judgment of students' comprehension performance, the panel of reading experts determined the students' true reading level to the nearest grade level.

The results of the panel's reliability exercise were as follows:

Panel Member	Student 1		Student 2		Student 3	
	General	Content	General	Content	General	Content
1	6	6	9	12	11	11
2	6	7	9	11	11	10
3	7	7	9	12	11	10
4	6	7	9	12	11	10

To determine how reliable the panel of reading experts were at evaluating entering freshmen international students' general and content reading ability, an

anaylsis of variance SAS program and a microcomputer were utilized to calculate the estimate reliability of measurements using the procedures found in Winer's (1962) Statistical Principles in Experimental Design.

In terms of the adjusted analysis of variance, for differences in frames of reference, the reliability of the mean of the four judges for general reading ability was: $\bar{r}$ = .9965.

The intercorrelation between pairs of judges for general reading ability was:

	Judge 1	Judge 2	Judge 3	Judge 4
Judge 1		.993	.993	.993
Judge 2			.999	.999
Judge 3				.999

The adjusted analysis of variance for content reading ability resulted in a reliability, for the mean of the four judges, of: $\bar{r}$ = .984.

The intercorrelation between pairs of judges for content reading ability was:

	Judge 1	Judge 2	Judge 3	Judge 4
Judge 1		1.000	.968	.986
Judge 2			.968	.986
Judge 3				.996

The adjusted analysis of variance for the differences in judges' assignment of grade level scores for student's general and content reading ability resulted in a mean reliability of: $\bar{r}$ = .984

The intercorrelation between pairs of judges differences in scoring students' general and content reading ability was:

	Judge 1	Judge 2	Judge 3	Judge 4
Judge 1		.961	.971	.891
Judge 2			.866	.982
Judge 3				.756

Results indicated that the panel of reading experts was very reliable in determining the general and content reading ability of entering freshmen international students, and that there were no significant differences in judges determination of general and content reading ability.

APPENDIX G

RESEARCH APPROVAL FORMS AND CONSENT

The University of Oklahoma at Norman

Office of Research Administration

March 30, 1981

Mr. Donald Ratchford
College of Education
University of Oklahoma

Dear Mr. Ratchford:

At its March 27 meeting, the Institutional Review Board-Norman Campus reviewed your proposal for "Reading Ability of Entering Undergraduate International Students at a Southwestern University: Some Implications." The Board found that this research would not constitute a risk to participants beyond those of normal, everyday life except in the area of privacy which is adequately protected by the confidentiality procedures. Therefore, the Board has approved the use of human subjects in this research contingent upon receipt and approval of an appropriate "Agreement to Participate" form.

Please send the draft form to me. I will have the IRB-NC Chair review and approve/disapprove the draft, then inform you. If you have any questions, please contact me.

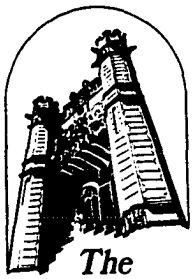
Sincerely yours,

Mark Elder
Administrative Officer
Institutional Review Board-Norman Campus

ME:rs

cc: Dr. Eddie Smith, Chair, IRB-NC
Dr. Caryl Adams, Education

1000 Asp Avenue, Room 314, Norman, Oklahoma 73019 (405) 325-4757



The University of Oklahoma at Norman

College of Education

AGREEMENT TO PARTICIPATE

Title of Project: "Reading Ability of Entering Undergraduate International Students at a Southwestern University: Some Implications"

Investigator: Donald L. Ratchford, Teaching Assistant, College of Education, Department of Reading, ECH 131-A, 325-4843 Ext. 8.

I, _____, hereby agree to participate as a volunteer in the above named research study, which has been fully explained to me.

I understand that I am free to refuse to participate or to refuse to answer any questions at any time without prejudice to me. I further understand that I am free to withdraw my consent and to withdraw from the research study at any time without prejudice to me.

I understand that by agreeing to participate in this research and signing this form I do not waive any of my legal rights.

_____ _____

Date Participant Signature

The
University of Oklahoma at Norman

Office of Research Administration

April 1, 1981

Mr. Donald Ratchford
College of Education
University of Oklahoma

Dear Mr. Ratchford:

Dr. Eddie C. Smith, Chair of the Institutional Review Board-Norman Campus, has reviewed the draft "Agreement to Participate" for your study, "Reading Ability of Entering Undergraduate International Students at a Southwestern University: Some Implications." Dr. Smith found that this draft will satisfy the Board's requirement; thus, the research has now been fully approved for the use of human subjects.

Thank you for your prompt response to the Board's request.

Sincerely yours,

Mark Elder
Administrative Officer
Institutional Review Board-Norman Campus

ME:em

cc. Dr. E. Smith, Chair, IRB-NC
Dr. C. Adams, Education

1000 Asp Avenue, Room 314, Norman, Oklahoma 73019 (405) 325-4757

ELS Language Center

Intensive English Programs in Centers Located Throughout the United States

April 9, 1981

TO WHOM IT MAY CONCERN:

Don Ratchford had our permission to administer a series of reading tests to our international students.

Sincerely,

Celia Rooney

Celia Rooney
Director

CR/mc

c/o University of Oklahoma / 1666 Cross Center Drive / Norman, Oklahoma 73069 / U.S.A.
Phone: (405) 364-7170 / Cable: ROSETTA, Norman

The University of Oklahoma at Norman

College of Education

Dear Student:

I am conducting an important research study concerning international students and their ability to read college textbooks. This study has the potential of effecting some needed policy changes in the admission of international students.

You and 27 other freshmen international students have been selected to participate in this research. The study is designed to benefit you as well as other international students who may enter the University of Oklahoma in succeeding years.

Your participation will take approximately $2\frac{1}{2}$ hours and include: (1) taking a standardized reading test, (2) taking two cloze tests (a sentence completion test), and (3) having your reading ability evaluated by an expert in the field of reading.

The test date is scheduled for Friday April 3rd at 1:00 to 5:00 pm in the College of Education, room 137. Please call me at 325-4843 or 321-8358 if you cannot make this important test date. Another test date will be scheduled if necessary.

Approximately 10 days after testing, you will be informed as to your test results and given an accurate description of your reading ability. All of your test results will remain confidential and in no way will the published results of the study violate your rights of privacy.

Your participation is greatly appreciated.

Sincerely,

Donald L. Ratchford

820 Van Vleet Oval, Norman, Oklahoma 73019

APPENDIX H

RAW DATA

RAW DATA

		NELSON-DENNY				CLOZE		READING PANEL		
Student #	TOEFL	voc	comp	total	Gen	Non-Sci	Sci	Gen	Non-Sci	Sci
1	613	33	38	071	23	00	31	16	00	16
2	648	56	50	106	33	00	22	15	00	14
3	620	50	44	094	27	24	00	16	16	00
4	613	15	26	041	14	00	13	09	00	14
5	600	23	38	061	11	00	08	12	00	12
6	607	38	44	082	27	31	00	15	16	00
7	600	29	32	061	20	00	18	13	00	15
8	600	30	38	068	18	00	21	15	00	12
9	610	25	16	041	15	00	28	12	00	14
10	600	32	50	082	34	33	00	14	15	00
11	607	34	62	096	25	00	22	14	00	15
12	600	30	38	068	20	00	21	13	00	14
13	603	31	36	067	19	27	00	14	15	00
14	607	31	34	065	23	28	00	16	16	00
15	567	21	26	047	15	10	00	11	11	00
16	557	21	30	051	16	00	32	10	00	11
17	573	28	50	078	19	15	00	13	16	00
18	553	15	24	039	15	00	17	14	00	14
19	580	28	30	058	24	00	15	14	00	15
20	573	30	32	062	22	00	23	16	00	16
21	573	13	26	039	11	12	00	10	12	00

		NELSON-DENNY			CLOZE			READING PANEL		
Student #	TOEFL	voc	comp	total	Gen	Non-Sci	Sci	Gen	Non-Sci	Sci
22	580	40	50	090	15	00	17	14	00	14
23	583	19	24	043	16	20	00	08	11	00
24	550	17	36	053	16	16	00	15	15	00
25	567	23	36	059	16	08	00	16	16	00
26	563	15	38	053	20	00	19	11	00	12
27	567	10	20	030	11	00	26	12	00	10
28	580	28	30	058	25	00	23	15	00	14
29	503	28	30	058	15	00	12	15	00	15
30	503	23	30	053	11	10	00	11	11	00
31	527	19	30	049	11	00	11	10	00	15
32	533	29	24	053	19	00	16	15	00	16
33	520	23	32	055	10	00	17	12	00	15
34	542	25	32	057	18	00	17	12	00	16
35	541	24	34	058	17	14	00	15	15	00
36	540	21	28	049	10	00	21	10	00	14
37	523	39	34	073	20	00	14	15	00	15
38	507	24	32	056	12	18	00	09	07	00
39	537	26	32	058	12	19	00	11	14	00
40	548	36	28	064	17	00	20	14	00	15
41	509	28	22	050	10	12	00	16	16	00
42	500	29	32	061	14	11	00	16	16	00

		NELSON-DENNY				CLOZE		READING PANEL		
Student #	TOEFL	voc	comp	total	Gen	Non-Sci	Sci	Gen	Non-Sci	Sci
43	453	11	24	035	11	08	00	11	11	00
44	453	21	22	043	07	00	08	09	00	04
45	457	13	18	031	09	00	11	09	00	04
46	461	21	16	037	13	00	14	09	00	11
47	462	18	30	048	13	10	00	09	10	00
48	468	21	26	047	18	00	21	11	00	15
49	463	18	22	040	10	09	00	09	07	00
50	475	14	24	038	10	16	00	12	15	00
51	490	11	28	039	20	00	17	11	00	10
52	456	19	26	045	13	06	00	09	14	00
53	473	28	16	044	13	00	14	09	00	15
54	450	17	20	037	05	00	10	09	00	14
55	487	30	42	072	16	00	19	11	00	12
56	463	23	30	053	18	00	13	10	00	14
57	432	21	12	033	08	00	18	07	00	08
58	400	22	18	040	03	00	12	09	00	09
59	427	25	14	039	13	07	00	09	15	00
60	417	12	30	042	09	05	00	09	08	00
61	407	16	20	036	13	10	00	09	11	00
62	437	16	18	034	11	10	00	11	10	00
63	447	10	20	030	11	00	13	11	00	12

		NELSON-DENNY				CLOZE		READING PANEL		
Student #	TOEFL	voc	comp	total	Gen	Non-Sci	Sci	Gen	Non-Sci	Sci
64	420	15	14	029	14	00	13	04	00	04
65	403	13	10	023	07	07	00	10	09	00
66	417	16	18	034	11	09	00	06	05	00
67	432	16	26	042	07	08	00	11	13	00
68	447	18	16	034	10	10	00	07	04	00
69	437	14	16	030	10	00	13	10	00	07
70	423	09	16	025	11	10	00	10	10	00

APPENDIX I

DISTRIBUTION OF INTERNATIONAL STUDENTS AT THE UNIVERSITY OF OKLAHOMA ACCORDING TO MAJORS

International Students According to Majors Fall 1980.

Major	No. of Students
Environmental Design (B.S. in Env. Des.)	3
Architecture (5 yr. program) (B Arch)	26
Architecture - Pre Arch. (B.S. Env. Des.)	80
Environmental Design Constr. Science (B.S. in Env. Des.)	10
Botany (B.S.)	1
Zoology (B.S.)	2
Microbiology (B.S. in Micro.)	1
Microbiology (B.S.)	6
Business (no major) Undergrad (non-degree)	7
Accounting (B.B.A)	7
Accounting (B.A.C.)	1
Accounting - Und Option (undecided)	2
Finance (B.B.A.)	4
Management (B.B.A.)	16
Petroleum Land Management (B.B.A.)	9
Marketing (B.B.A.)	11
Real Estate (B.B.A.)	1
Economics (Business) (B.B.A.)	7
Communication (B.A.)	2
Journalism New Communication (B.A. in Journ.)	1
Journalism (Prof Writing) (B.A. in Journ.)	2
Journalism (Public Relations) (B.A. in Journ.)	2

Journalism (Advertising) (B.A. in Journ.)	1
Journalism (Advertising) (B.A. in Journ.)	1
Journalism (Radio/T.V.) (B.A. in Journ.)	3
Computing Science (B.S.)	7
Computing Science (B.S. in CS)	3
Computing Science (B.S. in CS)	17
Education - no major (non-degree)	1
Elementary Education (B.S. in Educ.)	2
Special Education Comb. MHELD (B.S. in Educ.)	2
Early Childhod Educ. (B.S. in HEC)	1
Physical Education (B.S. in Phy. Ed.)	3
Language Arts Education (B.S. in Educ.)	1
Engineering: Undecided Field (undecided B.S.)	7
Engineering: Computer Science Plan (B.S. in Eng.)	5
Engineering: Pre Arch Plan (B.S. in Eng.)	7
Aerospace Engineering (B.S. in Aero E)	19
Chemical Engineering (B.S. in Chem. E)	48
Petroleum Engineering (B.S. in P.E.)	96
Natural Gas Engineering (B.S. in Nat. GASE)	4
Civil Engineering (B.S. in CE)	223
Electrical Engineering (B.S. in E.E.)	140
Mechanical Engineering (B.S. in M.E.)	131
Geological Engineering (B.S. in Geol. E.)	5
Industrial Engineering (B.S. in I.E.)	44

Metallurgical Engineering (B.S. in Met. E.)	7
Engineering Physics (B.S. in Engr. Phys.)	7
Nuclear Engineering (B.S. in Nuc. E.)	15
Environmental Science (B.S. in Env. Sci.)	3
Art - Advertising: 2 Dimen. Des. (B.F.A. in Art)	3
Film Making/Video (B.F.A. in Art)	1
Painting (B.F.A. in Art)	1
Art 3D Design (B.F.A. in Art)	2
Drama (Gen. Theatre - B.F.A. in Drama)	1
Dance Modern Dance Perf. (B.F.A. in Dance)	1
Dance Modern Dance Pedagogy (B.F.A. in Dance)	1
Music-Voice (B Music)	1
French (B.A.)	2
Spanish (B.A.)	1
Medical Technology (B.S. in Med. Tech.)	10
Lab Technology (B.S. in Lab Tech.)	2
Home Economics - General (B.S. in HEC)	1
Interior Design (B.A.)	6
FACT - Fashion Arts (B.A.)	1
FACT - Merchandising (B.S. in HEC)	1
HECON - Nutrition/Dietetics (B.S.)	3
English (B.A.)	1
Linguistics (B.A.)	1
Math (B.S.)	3

Math (B.S. in Math)	4
Math (undecided)	1
Physics (B.S.)	1
Physics (B.S. in Physics)	1
Chemistry (B.S.)	4
Chemistry (B.S. in Chemistry)	3
Chemistry (undecided)	2
Geology (B.S. in Geol.)	4
Psychology (B.A.)	7
Economics (B.A.)	1
Law Enforcement Admin. (B.A.)	1
History (B.A.)	1
Geography (B.A.)	1
Political Science (B.A.)	5
Sociology (B.A.)	1
Urban Studies (B.A.)	1
No Major	33
Pre-Architecture (AES) (B.A.)	1
Total	1,119

APPENDIX J

ACADEMIC SUPPORT SERVICES FOR INTERNATIONAL STUDENTS AT THE UNIVERSITY OF OKLAHOMA

1. English Classes for Non-English Speakers - Each semester the Community Extra- Curriculum Program (OU Student Affairs Division) offers a course in Basic English for non-English speakers. The class covers the fundamentals of English conversation and pronounciation. Attention is given to vocabulary for everyday situations. Instructors are professional English teachers. The class meets for eight sessions and the cost is very moderate. (Brochure - Community Services & Programs for OU International Students and Families).

2. The Student Development Programs Office offers the following services: (International Handbook for OU Students and Exchange Faculty, The University of Oklahoma).

A. Individual Assistance: Among the areas of assistance are reading skills, writing skills, note-taking, test-taking, budgeting of time, etc. Study skills tests are also available free of charge to determine problem areas which may be affecting your academic success.

B. Tutoring: The free tutoring service is available from 6:00 to 10:00 p.m., Monday through Friday with highly qualified tutors to assist students in most undergraduate course areas. Tutoring is available on an individual basis with no appointment necessary. Tutoring by appointment is offered from 8:00 to 5:00 p.m.

C. Test File Service: The test file service has over 600 undergraduate courses on file with copies of recent tests that were donated by students and faculty. Copies of the tests may be made for 5¢ per page.