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A case study of the predictive ability of placement tests for principles of accounting

Sonja Ann Sanders Villaire
College of William & Mary - School of Education

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A case study of the predictive ability of placement tests for principles of accounting

Villaire, Sonja Ann Sanders, Ed.D.

The College of William and Mary, 1991

A CASE STUDY

OF THE PREDICTIVE ABILITY OF

PLACEMENT TESTS

FOR PRINCIPLES OF ACCOUNTING

A Dissertation

Presented to

The Faculty of the School of Education

The College of William and Mary in Virginia

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Education

---

by

Sonja Ann Villaire

July, 1991

A CASE STUDY

OF THE PREDICTIVE ABILITY OF

PLACEMENT TESTS

FOR PRINCIPLES OF ACCOUNTING

by

Sonja Ann Villaire

Approved July 1991 by

_____
Roger R. Ries, Ph.D.
Chair of Doctoral Committee

_____
Deborah M. DiCroce, Ed.D.

_____
Roger G. Baldwin, Ph.D.

DEDICATION

This dissertation is dedicated to my husband, Nathaniel, and to my children, Angela, Katherine, Anthony, and Pamela. When I became a "returning woman" student, life changed for all of us. Through the years of finishing my bachelor's, master's, and educational specialist, passing the CPA examination, and now completing the doctor of education, my husband and children have all had to readjust their lives due to my involvement with some phase of my education. They learned to prepare meals as necessary, do their own laundry, and assume a share of the household chores occasionally that normally would have been my domain. They learned the necessity of coordinating personal plans with other family members, lest we all find ourselves involved with mutually exclusive events. All this they did, not only without complaining, but always with encouragement, without which I might have given up long ago.

To my husband, thanks for your continuous encouragement and support. You've never allowed me the luxury of becoming complacent with our lives as they were at the moment; you've insisted that we continually seek and accept new challenges. I'm glad we undertook the challenge of our doctorates together. I look forward to the future these degrees have made possible for us.

To my children, thanks for all of your help, understanding, and encouragement. In working and cooperating with me and with each other, you helped remove many of the obstacles along the way for me. Hopefully, what you lost in motherly nurturing, you gained in self-reliance and self-sufficiency. Remember that you are never too old, nor too busy, to continue your own education. There will never be a perfect time to go back to school, but there's no better time than now to begin.

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ABSTRACT

The predictive ability of mathematics and reading placement tests used as a prerequisite for entry into the introductory level of accounting principles was investigated in a case study conducted at Thomas Nelson Community College in Hampton, Virginia for students enrolled during the 19-month period beginning with June 1988 and ending with December 1989. The entire population of 1353 students was used in the study which tested for the independence of two variables, assessed or non-assessed students and their success (or non-success) in the course. In addition, the scores on the placement tests were compared with the final grade of the students to establish any possible correlation between the scores and grades. Other variables such as gender, age, day or evening student status, full- or part-time status of the student or faculty, and/or curricula were also tested for their predictive qualities. The study used Chi-square statistics and stepwise multiple regression analysis to evaluate the results.

The study confirmed that although there appears to be a positive correlation between some of the reading and mathematics placement tests used in the study, students who have been subjected to placement testing did not score better than the students who had not been assessed. In the area of mathematics, arithmetic skills appear to be a more significant predictor of final grade outcome than does the placement test on elementary algebra. Both reading placement tests investigated showed significant, though limited, predictive value.

Further study should include re-evaluation of the placement tests being used for their validity as a predictor of success. The level of cut-off scores which are deemed to be acceptable should also be examined. Also, further study might explore the impact that factors other than adequate entering skills, such as teaching methodology, textbook materials, accounting laboratories, and use of computers have on the success rate of accounting students.

SONJA ANN SANDERS VILLAIRE

SCHOOL OF EDUCATION

DEPARTMENT OF HIGHER EDUCATION

THE COLLEGE OF WILLIAM AND MARY IN VIRGINIA

A CASE STUDY

OF THE PREDICTIVE ABILITY OF

PLACEMENT TESTS

FOR PRINCIPLES OF ACCOUNTING

CHAPTER 1

Introduction

Need for the Assessment Process

The community, junior and technical colleges serve a unique function in American higher education. These colleges provide advanced education to members of the local community who most likely are pursuing higher education while also managing a full- or part-time job, a home and a family. They live at home rather than in dormitories and often are taking sporadic courses to fulfill a specific need of the moment for their job or personal interest.

Thomas Nelson Community College, like most two-year institutions of this type, is a commuter community college where more than half of the students are part-time and/or evening students. These students often decide on the spur of the moment to register for a class or classes when the beginning of classes is imminent. Since there is little time available, students often do not go through what would be considered a normal intake process. The only requirement for a potential student to enter into Thomas Nelson Community College is a completed application for admission. It is

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entirely possible for a student to file an application, register for classes, and go directly to a class, all within a few minutes. When this happens, the student may register for classes without any advising, counseling or information which ascertains the probability of his/her success in the class for which he/she has just registered.

Students have no problem being admitted and getting into classes, but sometimes lacking prerequisite knowledge and with poor study skills, students find themselves over their heads with seemingly no way out. Discouraged, they often just stop attending classes (a stop-out) and never return to acquire the knowledge they sought. Thus, the open door policy often becomes a revolving door (Roueche & Baker, 1987).

Therefore, this easy process of admission produces a dilemma for these two-year institutions--namely, how to preserve the open door policy's attractiveness while also serving the students' best interest and helping them reach the goals they seek. Students may enter college easily, but, without appropriate guidance, they may leave before attaining their goals.

Students who attend community or junior colleges often have little or no other college experience. Even if they have previously attended other institutions of higher education, their efforts often ended in failure. Many of these students were average or below average students in high school and may never have expected or prepared to attend college. Now,

because of job requirements, or lack of training for a job, they have decided to try to take a few college courses. Some enter the college environment without having attained a high school diploma. With poor or incomplete grades in high school, poor study skills and often a lack of confidence, they apply for admission to a two-year college. Most have a capability for college level work, but do not know how to go about developing it.

A paper entitled, "Access, Assessment, and Developmental Education in the Community College," which appeared in the June/July 1987 issue of AACJC Journal, contained these comments:

> Many students who see community college as their last chance for opportunity desperately need professional intervention through developmental assessment and support programs. Without these interventions, community colleges often make a mockery of the open-door concept. Community colleges that allow or advise underprepared students to enter classes for which they are not prepared may be closing the door to student success and blocking the road to achievement of both institutional and student educational goals. (AACJC Journal, 1987, p. 38)

These students need guidance. They need someone to evaluate their academic background and help them meet their

specific needs. They need someone to assist them in such details as where to start and how to reach their goals. Sometimes they even need help in setting their goals. They also need someone who can tell them about the contents of specific courses and what may be required of them to complete these courses. But this guidance cannot be offered without extensive investigation of the student's prior learning and skills. Assessment and placement testing, in theory at least, help the counselor determine whether the student will be able to succeed in college level courses requiring specific entering skills.

Justification for the Study

In the summer of 1988, Thomas Nelson Community College began a program of assessment and placement for new students being admitted. Except for a limited number which may be taken without prerequisites, most courses offered require the new student to provide evidence of proficiency in areas of reading, mathematics and English grammar. This evidence of proficiency may be provided by transcripts showing appropriate courses successfully completed or by Scholastic Aptitude Tests (SAT) or American College Test (ACT) scores, if available. If unable to provide evidence of proficiency by either of the above means, a new student is required to take a battery of placement tests to establish the level of his/her entering skills. Based on the student's scores on these placement

tests, the student is advised of any developmental courses which might be needed prior to taking any college credit courses which do not appear on the "no prerequisite" list. These tests provide information about the student's level of competence and provide the basis for placement of the student into either credit courses or developmental courses as needed. Each of the tests has specified cut-off scores for entry into specific courses. All of these tests are nationally recognized instruments used for assessment and placement for students who have not demonstrated proficiency in English grammar, reading and mathematics.

Accounting is definitely a course where students need the advantage of entering with a solid understanding of mathematics and reading skills. Although accounting is not a mathematics course in itself, students are expected to be able to perform the basic mathematical functions and to evaluate word problems logically without significant explanation in class. Since a significant amount of new terminology is introduced, accounting also requires a reasonably good level of reading and comprehension skills.

Because accounting courses, particularly the entry level courses, traditionally have a very high rate of attrition, placement tests in both reading and mathematics are now required before admittance into Accounting 211, the first course of accounting principles. The requirement for mathematics testing was implemented for Summer 1988, and the

reading placement requirement was effective for Fall 1989. It is assumed that if students are screened and adequately prepared before attempting accounting courses, their chances for success will improve.

Statement of the Problem

The purpose of this study was to evaluate the effectiveness of assessment and placement tests as predictors of success for entry level accounting students at Thomas Nelson Community College. To do this, the study examined the records of students who took Accounting 211 during the period of Summer 1988 through Fall 1989.

Before the Summer of 1988, assessment and placement testing were not a routine part of the intake process for students at Thomas Nelson Community College. Consequently, only 481 students of the 1353 total students who took Accounting 211 for credit during the period examined had taken a mathematics placement test, while 872 students had not taken any mathematics placement test. Likewise, only 540 students had taken tests for placement in reading, while 813 students had not been tested for reading skills. These students who had not been tested formed the non-assessed, control groups for comparison with those students who had been tested and assessed in the areas of mathematics and reading.

One goal of the study was to ascertain if the assessment and placement program provided any significant improvement in

the successful completion ratio in Accounting 211 which could be attributed to the assessment process using reading and mathematics placement tests. Thus, the primary focus of the study was to test for differences in the success and attrition (non-success) rates of students who had been subjected to the assessment and placement process from those students who took Accounting 211 without benefit of assessment and placement. A significant difference in the success rate, which could be attributed to the assessment process, would indicate that the assessment program was successful with regard to students who take Accounting 211.

A secondary goal of the study was to determine if there is any significant correlation between the scores attained on the placement tests and the final grades earned by the students who had been subjected to the assessment process. Other measurable factors, such as age, gender, curriculum, day or evening status of the student, and the full- or part-time status of both students and faculty were included to determine their effect on the students' final grade as well.

With these goals in mind, the following research questions were investigated:

1. Is there a significant difference in the performance (successful or non-successful) of Accounting 211 students who have been subjected to assessment and placement procedures from those who have not been subjected to assessment and placement procedures?

2. Is there a significant difference in the percentages of each letter grade received by students who have been assessed and those who have not been assessed?

3. Can mathematics and reading placement test scores be used to predict success in Accounting 211, and is there a correlation between placement scores and Accounting 211 grades?

4. Do other variables such as gender, age, day or evening student status, full- or part-time status of the student and/or faculty, or the curriculum in which the student is enrolled, significantly influence the predictive ability of the placement testing?

Definition of Terms

Because certain words or phrases may have different connotations when used in other situations, definitions of some terms, as specifically used in this study and relating to Thomas Nelson Community College and the Accounting 211 classes, are given below.

Assessment — As defined at Thomas Nelson Community College, "the process of reviewing a student's record and determining whether a

student requires testing"
(Loland & Wheelan, 1988).

Placement - At Thomas Nelson Community College, a decision by professional counselors, and imposed on new students, based on the following: approved (placement) test scores, academic transcripts, and personal interview (Loland & Wheelan, 1988).

Placement Tests - A battery of standardized tests administered to new students in the areas of mathematics, reading, and English grammar.

Placement Test Scores - The raw scores earned by students who have taken placement tests.

Successful - A student whose final grade in a course taken for credit was "D" or better.

Unsuccessful - A student whose final grade in a course taken for credit was "F" or "W".

Attrition - The portion of students who receive any final grade other

than "A", "B", "C", or "D".
Usually used to describe the
portion of students who do not
successfully complete a course
and accordingly receive a final
grade of "F" or "W". In this
study, "attrition" and
"unsuccessful" can be used
interchangeably.

A, B, C, D   — Letter grades used to indicate
the level of achievement for a
student who is successful in
completing the requirements for
a course. "A" indicates the
highest level of achievement
while "D" indicates minimal
acceptable achievement. All
students who receive these
grades in Accounting 211 are
awarded three semester hours of
college credit.

F   — Letter grade used to indicate
that a student who remained
enrolled in the course for the
entire semester failed to meet
the requirements for

satisfactory completion of the course. No credit is awarded for an "F".

W   - Letter grade used to indicate that a student officially withdrew from the course prior to the end of the semester and therefore was not successful in completing the course requirements. No credit is awarded for a "W".

Research Methods and Data Collection

The Office of Institutional Research and the Computer Center at Thomas Nelson Community College extracted the data for the study from student records. The data were retrieved by semester and section numbers for the specific classes of Accounting 211 that were taught for the semesters Summer 1988 through Fall 1989. Records prior to this time were not used because assessment was not a requirement. The records were sorted and entered into the computer with specific data showing semester taken, day or evening class, full- or part-time instructor. Specific student data showing gender, age range, ethnic origin, new or prior student status, full- or part-time status, curriculum area, and grade in the course

were also entered. In addition, data about any placement tests the students may have taken were entered.

Limitations of the Study

This study was limited to analysis of data collected about students in Accounting 211 classes which were taught at Thomas Nelson Community College in Hampton, Virginia between the dates of June 15, 1988 and December 15, 1989, inclusive. This study was further limited to information which was available through normal college records (such as final grades, age, gender, race, full- or part-time status, day or evening student, and placement scores if applicable) and did not include such individual personal factors as family influence, job constraints, financial restrictions, motivation, emotional stress, and/or variations in the instructional methods, testing procedures, or evaluation policies of the specific faculty member who taught that section of the course. While these individual personal factors may have significantly influenced the student's final grade, these factors were neither measurable nor available within the scope of this investigation. The ability to generalize the results of this case study to future studies may be impaired when similar or different personal factors influence the students' final grade.

Ethical Considerations

For protection of both students and faculty, confidentiality of student records was insured by the random assignment of numbers to identify each record. No student names or social security numbers were used in the input of data for statistical analysis. Instructors were not named; rather they were identified only as full- or part-time faculty members. All records supplied by the Computer Center were kept secure in the possession of the researcher at all times. All data were archive data and did not involve any contact with either students or faculty.

CHAPTER 2

Critical Review of the Literature

Introduction

In 1988, in an article appearing in Change, Pat Hutchings and Elaine Reuben wrote:

> In the past two years, the national conversation about assessment has grown in scope and volume: we've heard from governors, legislators, and state board members; from scholars of higher education and campus administrators; from Bennett, Bok and Boyer. (Hutchings & Reuben, 1988, p. 25)

Since that time, assessment has become even more of a topic of conversation among educators. The general public as well as government officials have demanded that institutions of higher learning be accountable for proving that they are using taxpayer money wisely and effectively. However, complying with this public demand may be easier said than done. Measurement of students' learning progress is affected by numerous factors, many of which have little to do with learning itself. Even the methods of assessing student improvement become muddled with the attempted determination of just what is the most valid and reliable method of assessment

(Marchese, 1987). Although this research will focus primarily on the junior, technical, and community colleges, the issue of assessment is one of the major topics of discussion and decision-making in all institutions of higher learning today.

Assessment itself takes on many connotations. One type of assessment being used is to test the students as they begin their higher education in order to determine if any developmental or remedial courses need to be taken before entering regular credit courses. Another purpose of assessment is to determine what prior learning the student has and if some of the introductory or more basic courses may be omitted from the student's list of required courses. In some cases, students' prior experiences may exceed any textbook knowledge gained by taking the course sitting in the classroom. These students may benefit from assessment by being granted credit for courses based on their knowledge gained from prior experience. In this way they are permitted, and encouraged, to enroll in courses which will be interesting and challenging at their present level of knowledge rather than being bored repeating material already mastered (Forrest, 1977).

The first type of assessment, testing for level of entering skills, is of particular importance to the community college since many students enter without having a high school diploma. They may, or may not, have the skills and entering knowledge necessary to ensure an opportunity for success in

college level courses. Assessment is a means of placing them in the appropriate courses as well as instilling in them the confidence that they are prepared to take the course. The article, "Access, Assessment, and Developmental Education in the Community College," in the AACJC Journal relates:

> Many students who see community college as their last chance for opportunity desperately need professional intervention through developmental assessment and support programs. Without these interventions, community colleges often make a mockery of the open-door concept. (AACJC Journal, 1987, p. 38)

This process of assessment and placement in the two-year colleges helps to prevent the open door policy from becoming a revolving door (Roueche & Baker, 1987).

As Roueche and Baker discuss, students who are allowed to enter courses for which they are ill-prepared, often become discouraged and drop out without reaching their goals. In some cases, the student may perceive the course(s), and/or college in general, as being beyond his/her capabilities. When this occurs, the student may leave higher education with negative feelings about both the college and his/her academic abilities, which are difficult, if not impossible, to erase. Once students have tried and failed, it becomes more difficult to get them to re-enter higher education than when they first entered.

Although there are many aspects of assessment, this study was limited to material related to higher education uses in the areas of pre-screening, prior learning assessments, and predictions of academic achievement.

Pre-screening

In the past, most junior, technical, and community colleges had an open-door policy which maintained that every student has the "right to try" college level courses. A large number of these students are those who have been turned down for admission to four-year institutions or other colleges which have restricted admission based on SAT scores or high school grade point average. With an open admission policy, community colleges welcome these students. However, without any pre-screening, or entering evaluation, many students register for courses without the prerequisite skills needed for success and progress in the course. In a very short time, these students may become discouraged and drop out. The June/July 1987 issue of the AACJC Journal contains this comment:

> Community colleges that allow or advise underprepared students to enter classes for which they are not prepared may be closing the door to student success and blocking the road to achievement of both institutional and student educational goals. (AACJC Journal, 1987, p. 39)

This possibly could be prevented if institutions begin an assessment and placement program to help the student advance his/her knowledge without overwhelming him/her.

In his article, "Open Door or Revolving Door" in the Community Technical and Junior College Journal, John Roueche, a leading community college researcher and analyst, comments:

> Most American colleges and universities, including community colleges, now require entry-level assessment of academic skills of all students who have not been successful in a previous college setting. Colleges have learned that high school grade point averages (GPAs) no longer are indicative, much less predictive, of student preparedness for college-level courses. Essentially, high school credentials and grades no longer possess currency; they do not represent student competencies or proficiencies. In contrast, only a decade ago, high school GPAs were the best single predictors of student success in college. With useless credentials the norm today, colleges have no choice but to determine by entry-level testing if students possess academic skills needed for success in college courses. (Rousche, 1987, p. 24)

Pre-screening or entry-level assessment of academic skills can be accomplished either by testing or by personal

evaluation. There may be many purposes for evaluation or assessment using pre-screening. These include prediction of success in a particular course or field (Stephens, Wileman, Konvalina, & Teodoro, 1985), assessment for placement at the appropriate level of study (Chatman, 1985), screening to limit enrollment (Turner & Gerardo, 1983), assessing prior learning for awarding credit (Knapp, 1977), and assessment as a basis for comparison with exit skills and knowledge (Harris, 1985).

Prediction for Success

Perhaps the most widely known tools for predicting success in college are the Scholastic Aptitude Tests (SATs) and the American College Test (ACT) as well as a student's high school grade point average (GPA). Although many educators, like John Roueche, believe these tests and indicators are not always an accurate measure of the ability to succeed at college level work, Juan Franco and Margaret Kaczmarek report in the Journal of the NAWDAC that the ACT scores have validity in predicting college success for Mexican Americans (Franco & Kaczmarek, 1981). Patricia Dwinell reports that the results of her investigation indicated that the SAT scores and high school GPA continue to be good predictors of academic performance (Dwinell, 1985). If a student applies for admission to Thomas Nelson Community College and has taken one or more of the tests mentioned above, those scores may be used for assessment and placement

in lieu of the battery of placement tests. However, most students who enter Thomas Nelson Community College, like most entering community colleges, have not taken either of the national tests.

Aside from these nationally administered tests, there are many good screening tests which test students' ability in single areas. One of the advantages of these tests is that the administering school grades the test locally and results can be evaluated more rapidly. As Dorothy Perkins noted in her 1984 article:

> The Nelson Denny Reading Test (NDRT) is probably the most widely used test of reading comprehension at the college level in the nation. However, reviews of the test, as well as recent reports of its failure to adequately measure gain or lack of gain of college students enrolled in reading improvement courses, do not support the popularity it has enjoyed. The conclusions drawn by some reviewers of the NDRT are that the test may have value at the college level when used for screening purposes, but that care should be exercised in interpreting scores for purposes of individual diagnosis. (Perkins, 1984, p. 64)

In her investigation, however, Julie Noble found the results indicated that reading skill, as measured by the NDRT, can be estimated with a moderate degree of accuracy by using

the ACT Social Studies Reading and ACT English Usage subtests
(Noble, 1985).

Other tests being used with some success for predicting
success and early identification of students who may need
special assistance are the Group Embedded Figures Test and the
Hidden Figures Test (Wilson & Davis, 1985), and the
individually-oriented standardized extended caution index
(ECI) (Chatman, 1985). Carney and Geis correlated data from
a standardized reading test and student background information
to determine relationships. Self-assessed reading scores and
other data may be used for predicting retention, academic
performance and reading ability. Differences were found
between persisters and dropouts on these variables (Carney &
Geis, 1981). In his longitudinal study of the English Usage
and Algebra Basic Skills test, David Suddick and Burton
Collins found that students who met the basic skills
requirements had a 40% higher rate of academic success and a
49% lower attrition rate than those not demonstrating minimum
competency in both English and Algebra (Suddick & Collins,
1984). Steve Ahrens used prediction equations and states, "It
is expected that not only will equations be developed to place
students into courses; but, also to indicate to the students
what their expected chances are in terms of success and
failure in the course as measured on a four point scale"
(Ahrens, 1980, p.4).

Assessment for Placement at the Appropriate Level of Study

One of the most widely known placement tests is the Multiple Assessment Programs and Services (MAPS) Placement Research Service which is a series of tests offered by the College Board for students entering non-selective colleges. Since these students show a wide range of abilities, the tests include reading, writing, and mathematics skills evaluations for use in placing students appropriately. The service analyzes test score and criterion data supplied by the college and produces a report based on the data. The college can use the information to establish decision rules for placing students into courses or to counsel individual students in the selection of courses (Livingston, 1986).

Most schools who use entry-level evaluations for placement purposes will place students in developmental courses to help the student acquire the skills needed to progress to college credit courses. However, when a student needs developmental courses in more than one area, it may be wise to progress slowly with developmental courses while allowing the student to take courses which may not require the developmental skills. Garcia and Romanik state that:

> Students enrolling in two or three developmental
> courses in their first term are more likely to drop
> out and had a lower retention rate than students
> enrolling in a single developmental course. (Garcia
> & Romanik, 1984, p. 4)

Western Michigan University uses an Intellectual Skills Development Program designed to identify students who do not meet entry-level competencies in reading, writing and mathematics, and to provide academic support for these students (McCauley, 1987).

Since 1983, the University of Nebraska (Omaha) has successfully applied the Konvalina, Stephens, Wileman (KSW) Computer Science Placement Test for placing students in appropriate classes. In 1985, the test was further validated by administering it to 152 Philippine students. The test was administered on the first day of classes. In addition, a common final examination was administered to all students for students completing the two basic computer courses. After examining the Pearson correlations between the KSW scores and final examination scores as well as point biserial and Kuder-Richardson formula (KR-20), the KSW test was then implemented for placing students in beginning courses. All correlations were highly significant (P < .01) indicating a direct relationship between performance on the KSW test and performance in each of the courses. The results of the study with the Philippine students are consistent with previous findings at the University of Nebraska at Omaha. Clearly, no procedure can be perfect in placing students. However, the procedures outlined in this paper can be applied to minimize the errors that can occur in placing students in beginning computer science courses (Stephens, et al, 1985).

On the other side of the coin, Kaczka and Singer, in their paper entitled "Acceptance Testing--Course Readiness Measurement", state,

> The results clearly demonstrated that successful completion of prerequisite courses is no guarantee of readiness for courses which build upon the prerequisite. (Kaczka & Singer, 1977, p. 10)

Sometimes even demonstrated ability in a particular field is not enough when the student does not apply these skills well. Often, the student has demonstrated minimum knowledge to advance to the next level, but once there, lacks the confidence and ability for practical application to the new material. No one test is infallible when it comes to measuring knowledge, nor is any one test completely foolproof in predicting success in courses even in the best of circumstances where the student is not significantly influenced by outside sources which might hinder his/her progress. However, on the positive side, these tests do tend to show enough reliability and validity to make them worthwhile instruments for assessment and placement (Kaczka & Singer, 1977).

CHAPTER 3

Methodology

Population and the Sample

Data were retrieved and extracted from the students'
academic records data base at Thomas Nelson Community College
for the five semesters beginning with Summer 1988 and ending
with the semester of Fall 1989. The data retrieved provided
a sample of 46 individual class sections involving 1366
students. However, since students who audit the course
receive neither credit nor a grade, those 13 students were
eliminated from the study, leaving 1353 students who did
receive a grade. The entire population of students taking
Accounting 211 for credit during this time period was used for
this study.

The data were sorted into the variables being tested as
predictors of success in the accounting course. The data
extracted from the students' academic records included: the
term the course was taken, the section number of the course
taken, the birth date, gender, and ethnic origin of the
student, the curriculum in which the student was enrolled, the
term the student first enrolled in the college, and the total
number of hours in which the student was enrolled during the

semester in which he/she took Accounting 211. Also included were the letter grade received by the student and the placement scores on any placement tests which the student had taken. Before the data could be entered into the statistical package and analyzed, birth dates were used to place students into seven age groups; section numbers were used to determine both the day/evening status of the class and the faculty member (full- or part-time) who taught the course. The term the student first enrolled in the college was used to determine prior or new student status, and the number of hours in which the student was enrolled was used to determine the student's full- or part-time status. Likewise, curricula designations were used to categorize students as accounting majors, business administration majors, other business majors, declared curricula other than business or no curriculum declared.

Demographics of Sample Population

The population included 1366 students, of which 1353 were enrolled for credit and the remaining 13 students were auditing the course. Because the audit students fall in neither the successful nor unsuccessful category, and their outcomes goal is unmeasured by grade structure, those records were eliminated from the study. Except for the 13 audit students, the entire population of students was used in the study without extracting a smaller sample. The population

used in the study consisted of 407 (30.1%) males and 946 (69.9%) females, of which 1004 students had been previously enrolled in coursework for credit at Thomas Nelson Community College. The age range of the students was composed primarily of students who were less than 28 years old, with 805 (59.5%) students of the 1353 falling into this range. However, there was a significant number of students (547, or 40.5%) who were more than 27 years old. The majority (956, or 71.3%) of the students were Caucasian, with 344 (24.6%) being black students. American Indian (4), Spanish American (15), Oriental (23), and other (11) races accounted for only 4.1% of the population studied.

Since the majority of the students (1004, or 74.2%) had taken other classes prior to enrolling in Accounting 211, only 349 (25.8%) students were new entrants and routinely required to take entry level placement examinations. However, because the placement examinations had been available earlier, though not required, the number of students who had taken a mathematics placement test was slightly higher (481, or 35.6%), and 540 (39.9%) students had been subjected to reading placement. (See Tables 15 and 16.)

More students (817, or 60.3%) attended classes in the evening (or on Saturday) than attended during the day (536, or 39.6%). Because the structure of the Saturday classes, usually one three-hour session per week, and the make-up of the students more closely parallels evening students, these

two groups can often be combined for analysis purposes. A similar breakdown occurs when evaluating the relationship between the full- and part-time status of the students. (See Tables 17 and 18.) More students (989, or 73.1%) attended part-time, while only 364 (26.9%) were registered for a full load of credits. However, while the evening (or Saturday) students were almost always part-time students (75.4% of evening/Saturday students), the day students were almost evenly divided between full- and part-time (54.7% and 45.3%, respectively).

The majority of the students (984, or 72.7%) were enrolled in either Accounting, Business Administration, or other business curricula, with 481 (35.6%) students in Business Administration alone. Slightly more than half (818, or 60.5%) of the students were taught by a full-time faculty member rather than adjunct personnel. (See Tables 19 and 20.) However, since the full-time faculty teach primarily during the day-time hours, 58.2% of their students were day students (Table 17), while the part-time faculty taught almost exclusively in the evening or on Saturday (88.8% of their students).

A cross-tabulation of race by gender of the sample population (Table 1) showed that there were 295 Caucasian and 94 black males, which constituted 95.6% of all males (407) enrolled. There were 661 Caucasian and 250 black females,

which together comprised 96.3% of the 946 females enrolled. Other races accounted for less than 4% (53) of the enrollees.

When age and gender of the sample population were cross-tabulated, the results (Table 2) showed that a higher percentage (37.3%) of the males was under 23 years of age than the females (35.5%) in the same age group.

A cross-tabulation of full-/part-time student status by gender of the sample population (Table 3) showed that 33.2% of the 407 males were attending classes full-time, while only 24.2% of the 946 females were full-time students.

When the full-/part-time student status and the day/evening/Saturday class attendance of the sample population were cross-tabulated, the results (Table 4) demonstrated that 75.4% of the 989 part-time students attended classes in the evening or on Saturday mornings, while 80.5% of the 364 full-time students attended classes during the weekdays.

Data Gathering Methods

Data were selected and extracted from the student records at Thomas Nelson Community College by the Computer Center personnel. By accessing the class rolls of the 46 sections of Accounting 211 which were taught during the period covered by the study, the students enrolled were identified, and subsequently, through their profile records, the demographic data were obtained along with their final grades earned and placement scores, if any. Data received included the

birthdate, race, gender, curriculum, college entrance date, number of hours enrolled, specific section of Accounting in which enrolled, final grade received, and the placement scores of any test taken. The data were transferred to a spreadsheet and randomly assigned a number to insure confidentiality. Data received were converted into usable data by categorizing age groups, ethnic background, curricula, gender, full- or part-time status of both student and the faculty teaching the course, prior college experience, day or evening attendance, final grade received, and the assessment data. The Lotus 1-2-3 spreadsheet package was used for this conversion of data. The data was then imported into the Number Cruncher statistical package.

Instrumentation

The placement tests for reading and mathematics were the instruments tested for their predictive ability in determining a student's final score in Accounting 211. Until the fall of 1989, Thomas Nelson Community College used two primary placement tests for evaluation of reading and English (written English expression) skills. These tests were the tests from the Comparative Guidance & Placement Program of the College Board (commonly referred to as "CGP") or the reading test from the McGraw-Hill Basic Skills System. Both of these instruments had satisfactory levels of consistency when tested for reliability using the Kuder-Richardson Formula 20. The

reliability coefficients were .90 for the CGP reading test and .89 for the McGraw-Hill reading test as evidenced in the examiner's manuals for each test respectively. Satisfactory validity studies have been conducted on each test using the Pearson product-moment correlation coefficients as appropriate. The cut-off scores have been established by the English department based on prior experiences.

The mathematics test used is the Descriptive Test of Mathematics Skills of the College Board which contains three levels. This instrument also proved satisfactory levels of consistency when tested for reliability using the Kuder-Richardson Formula 20. The reliability coefficients ranged from .91 to .86 for the three levels of mathematics skills tested. Appropriate validity testing on this series of mathematics placement test also documented substantial validity as evidenced in the Guide to the Use of the Descriptive Tests of Mathematics Skills (1985). Based on the student's background, either the Elementary Algebra, Arithmetic, or Intermediate Algebra level is administered to the student. The cut-off scores for each of these levels have been established by the mathematics department based on prior experience with the students. These tests, scored locally, help provide information about the level of competence the student has in those areas; they also provide the basis for placement of the student into either credit courses or developmental courses as needed. Each of the tests has

specified cut-off scores for entry into specific skills building courses offered as well as for entry into college credit courses.

All of these tests are nationally recognized instruments used for assessment and placement for students who have not demonstrated possession of basic skill levels in English, reading and mathematics. Their reliability and validity are satisfactorily documented in the technical manuals which accompany the tests.

Research Design

Data received from the Computer Center were converted into usable form by assigning a numerical value to the different components within a variable category. The term in which the student took the course was assigned a variable of one through five to identify the five semesters covered by the research. The class section numbers were used to determine whether the class was a day or evening class and who the teacher was. The letter grades recorded were assigned a numeric value with the number 5 being assigned to an "A", 4 assigned to a "B", 3 assigned to a "C", 2 assigned to a "D", and 1 assigned to an "F". Also a separate variable was established to identify those who succeeded and those who did not. The birth dates were used to assign the student to one of seven designated age ranges. The age ranges were divided into equal five-year groups. The curriculum number was used to

assign the student to a category of either accounting major, business administration major, other business major, other declared major or no declared major. The semester in which the student was first enrolled and semester hours taken were used to determine whether the student was a new or prior student, and whether the student was a full- or part-time student. Variables were also established to indicate whether the student had been assessed by the use of placement tests in mathematics and/or reading. If the student had been assessed by placement testing using the CGP or McGraw-Hill reading test or the Arithmetic Skills or Elementary Algebra mathematics test, the scores earned were also recorded. Gender and five categories of ethnic background were also assigned numeric values for entry into the statistical package. Each record was randomly assigned a number to insure confidentiality; it was then entered into the computer.

Specific Null Hypotheses

1. There is no significant difference in the performance (successful or non-successful) of students in Accounting 211 who have been subjected to placement procedures and those who have not been subjected to placement procedures.

2. There is no significant difference in the percentages of each letter grade received by

students who have been assessed and those who have
not been assessed.

3. Mathematics and reading placement test scores do
not predict success in Accounting 211.

4. Variables such as gender, age, day or evening
student status, full- or part-time status of the
student or faculty, and/or curricula do not
significantly influence the predictive ability of
the placement testing.

Statistical Analysis Technique

The hypotheses were tested using the Chi-square test to
test the independence of two variables. Also, multiple
regression analysis, entering the variables in a stepwise
fashion, was accomplished using the Number Cruncher
statistical package.

Summary of Methodology

All of the records of students who enrolled in Accounting
211 for credit in any of the five semesters beginning with the
summer semester of 1988 through the fall semester of 1989 were
obtained from the Computer Center at Thomas Nelson Community
College. Conversion of the data into a usable form for the
statistical package was done on a spreadsheet before
introduction into the statistical program. Specific
hypotheses were tested using the Chi-square test and the

stepwise multiple regression analysis to determine the best predictors of success as evidenced by the final grade received by students enrolled in Accounting 211 during the selected period. The effects of other variables such as age, gender, full- or part-time status of student and faculty, day/evening status, and curriculum were also included in the analysis.

The Number Cruncher statistical package was used to perform the Chi-square test and the stepwise multiple regression analyses. This program computes a multiple regression equation in a stepwise manner, adding one predictor (independent) variable to the regression equation at each step of analysis, with the constant and the partial regression coefficients as well as the standard error of estimate being recalculated at each step. Typically, the variable added is the one which will remove a maximum amount of residual variability from the dependent variable. The variable entered first is the independent variable having the highest partial correlation with the dependent variable. The minimum level of significance for including a predictor variable was set at the .05 level of confidence.

The stepwise multiple regression procedure first selects the variables in the order of their predictive ability with regard to the dependent variable. Next, it provides a value of multiple correlation to show the additive effect of each variable. By squaring these values, the degree to which the

variation in the dependent variable can be accounted for by the predictor variables is determined.

A partial regression coefficient is obtained when one of the independent variables is selected and added to the equation while all other independent variables are held constant. Hence, the partial regression coefficient shows how much of the predictability of the dependent variable can be explained by the specific independent variable.

CHAPTER 4

Analysis of Results

Introduction

The purpose of this study was to determine if placement testing in the areas of mathematics and reading at Thomas Nelson Community College had any influence on the success of students enrolled in Accounting 211 during the five semester periods between June 1988 and December 1989, inclusive. Table 23, Chi-Square Statistics, shows the results of the testing. Further, a comparison of the specific final grades received by the students was done to ascertain if the percentages of specific grades were higher for the assessed students than for those students who were not assessed. Table 6 shows the results of the cross-tabulation of mathematics assessment by letter grade while Table 7 reports the same relevant information for reading. Finally, the predictive abilities of the mathematics and reading placement tests most frequently administered were evaluated using stepwise multiple regression analysis to determine if scores on specific placement tests could be used to project success or failure in the introductory accounting course. Tables 24 through 27 report this stepwise multiple regression analysis with the dependent

variable (GRADENOW) being the numerical equivalent of the letter grade earned (W's were excluded). The variable codes used in this study are listed in Appendix A.

Discussion of Research Questions

This section restates the specific research questions and the results of statistical analysis determined for each question.

1. There is no significant difference in the performance (successful or non-successful) of students in Accounting 211 who have been subjected to placement procedures and those who have not been subjected to placement procedures.

A Chi-square test (See Table 23) was performed to test the independence of each of the two assessment categories, mathematics and reading, with the success or non-success of the students. The results of the tests showed that, for the mathematics assessment process, there was a Chi-square value of 3.5115 with a probability level of 0.1728. With 2 degrees of freedom and a confidence level of .05, the decision was made to accept the null hypothesis and conclude that assessment for mathematics and success in Accounting 211 are independent of each other. In other words, there is no relationship between assessment (or non-assessment) by mathematics placement and success (or non-success) in Accounting 211 at Thomas Nelson Community College.

In the area of reading, the Chi-square test statistics revealed a value of 16.0863 with a probability level of .0003. With 2 degrees of freedom and a confidence level of .05, the conclusion was to reject the null hypothesis and assume that assessment for reading and success in Accounting 211 are not independent of each other. Thus, there is a relationship between assessment (or non-assessment) by reading placement and success (or non-success) in Accounting 211 at Thomas Nelson Community College.

2. There is no significant difference in the percentages of each letter grade received by students who have been assessed and those who have not been assessed.

Tables 6 and 7 show the breakdown of each grade by the assessed or not assessed students in the mathematics and reading placement testing areas. While the Chi-square statistics indicated there were no significant differences for those assessed versus those not assessed in mathematics, a slightly higher percentage of non-assessed students was indicated for three of the four letter grades which are considered as successful. Of those who took mathematics placement tests, 22.9% received "A's", while 23.4% of the non-assessed students received the same grade. In the "B" grade level, 17.7% of the assessed students received this grade, while 20.1% of the non-assessed students were awarded "B's". At the "C" level, the two groups were virtually equal,

with 15.6% for the assessed group, and 15.5% for the non-assessed group. In the "D" range, 9.6% of the non-assessed group received this grade while only 7.5% of the assessed group were in this range. Those receiving a final grade of "F" were relatively equal with 15.6% of the assessed students failing and 13.1% of the non-assessed students being unsuccessful. A higher percentage of the assessed students (20.8% versus 18.3% non-assessed) gave up and withdrew from the course before completion. However, even though these percentages indicate that the non-assessed group performed slightly higher, the differences were not statistically significant, and therefore the null hypothesis was accepted in the area of mathematics.

In the reading assessment area, the results were similar with only 20.4% of the assessed students receiving "A's", while 25.1% of the non-assessed students received the same grade. At each grade level, a higher percentage of the non-assessed students received each passing grade than the assessed students. The Chi-square statistics indicated that these differences are significant, so the null hypothesis was rejected in the area of reading. However, results showed that while there is a difference, those that were not assessed scored better than those who had been assessed.

3. Mathematics and reading placement test scores do not predict success in Accounting 211.

Since the study focused on the two primary mathematics and the two primary reading placement tests administered, the stepwise regression analysis was performed a total of four times. Each time the dependent variable was the final grade ("gradenow," meaning grades with no withdrawals) received by the student; the independent variables were "gender," "age," "ftptstu" (full-time/part-time student), "daynight" (day or evening student), "ftptfac" (full-time/part-time faculty), "curr" (curriculum), and the specific test being evaluated as a possible predictor ("M1score," "M2score," "R1score," "R2score," respectively) as the seventh independent variable for each stepwise analysis.

In the first run when "M1score" (the arithmetic skills test) was an independent variable, the "M1score" was the first and only variable to enter the model since this variable was the only one to meet the 0.05 significance level requirement for entry (Table 24). This variable explained 10.39% of the total variance ($r^2 = 0.1039$). The correlation coefficient for the "M1score" was 0.3223 ($r = 0.3223$), and given the fact that this was the only variable to enter the model, this coefficient is both the simple and partial coefficient obtained in this analysis. Since there is a positive correlation between a student's score on this particular mathematics placement test and the student's final score, and

the probability level is within the range of the 0.05 confidence level (0.0001), the "M1score" (the arithmetic skills test) does seem to have some, although somewhat weak, predictive ability with regards to the final grade earned by students.

In the second run of the stepwise multiple regression analysis (Table 25), the dependent variable was the same ("gradenow"), and all of the same independent variables were entered again with the exception that "M2score" (elementary algebra test) was substituted for the "M1score." In this analysis, the first variable to enter the model was "age," which explained 8.2% of the total variance if this were the only variable to be entered into the model. The second, and final, variable to enter the model during this stepwise multiple regression was "ftptfac" (full-time/part-time faculty). However, this variable only added 4.3% to the explained variance in the stepwise multiple regression. No other variable met the minimum confidence level of 0.05% for entry into the model. When the two significant variables (those with probability levels of 0.05% or less) were both in the model, "age" alone explained only 6.02% (partial r^2 = 0.0602) of the variance and had a partial correlation of 0.2454 while full-time/part-time faculty could account for only 1.35% (partial r^2 = 0.0135) of the variance, and had a partial correlation of 0.1163. The "M2score" had a probability level of only 0.4896 and was not entered into the

model. The partial correlation coefficient for "M2score" was 0.1772. For these reasons, the "M2score" (elementary algebra test) could not be use as a predictor of the final grade for Accounting 211 students.

In the third run of the stepwise multiple regression analysis (Table 26), the dependent variable remained the same ("gradenow"), and all of the independent variables remained the same also with the exception that "R1score" (McGraw-Hill reading test) was used in place of the "M2score." In this analysis, the first variable to enter the model was the "R1score" with a probability level of 0.0000. With this variable alone, 11.57% of the variance was explained. With all other variables in the regression, the "R1score" explained 10.06% of the variance (partial $r^2 = 0.1006$). Also, the "R1score" had a relatively significant partial correlation coefficient of 0.3315. Next to enter the model was "age," which added 6.6% to the explained variance. Third, "ftptstu" (full-time/part-time student) entered the model and added 3.1% to the explained variance. No other variables met the required confidence level of 0.05. Thus, "R1score" (McGraw-Hill reading test) does have some, although weak, predictive ability in relationship to the final grades of students taking Accounting 211.

The fourth and final stepwise multiple regression analysis (Table 27) used the same dependent variable ("gradenow") and all of the same independent variables except

that "R2score" (the Comparative Guidance & Placement (CGP) Program of the College Board) was used in place of the "R1score." The first variable to enter the model was the "R2score" with a probability level of 0.0001. When this variable was in the model alone, it accounted for 9.8% of the variance. The partial correlation coefficient was 0.3021. The second, and last, variable to enter the model in this run of the stepwise multiple regression was "age" which added 3.9% of the explained variance to that point, with a probability level of 0.0109. No other variable met the minimum confidence level of 0.05. Therefore, the "R2score" (Comparative Guidance & Placement (CGP) tests of the College Board) also shows some predictive ability with relationship to the final scores of students who take Accounting 211.

In all of the stepwise multiple regressions except where "M2score" was used, the placement test scores were entered into the model and appear to have significant predictive value. Hence, placement test scores do explain a significant portion of the variation in grades for three of the four placement tests involved. The null hypothesis must be rejected for both of the reading tests and the arithmetics skills test but accepted for the elementary algebra test.

    4. Variables such as gender, age, day or evening student status, full- or part-time status of the student or faculty, and/or curricula do not

significantly influence the predictive ability of the placement testing.

In none of the four stepwise multiple regression analyses did "gender" show any significant influence on the predictive ability of the placement tests with regards to the final grade of students enrolled in Accounting 211. "Age" appears to have a slight, but significant, influence on the predictive ability of both the tested reading placement examinations and the elementary algebra placement examination in mathematics assessment. Also, Table 8 shows that the students who are under 23 earned grades that were considerably lower than their older classmates. Tables 9 and 10 support the fact that the older, evening students receive higher grades than their younger counterparts.

Whether the student attended classes during the day or evening was not shown to be a significant influence on the predictive ability of the placement testing process in any of the four analyses. The full- or part-time status of the student only appears significant as an influence for those students who were assessed using the McGraw-Hill reading placement test. However, the high percentage (73.1%) of students attending part-time could account for other, non-measurable reasons for receiving a specific grade, whether successful or non-successful, which remain unexplained by this study. Among those reasons could be time available for study, the level and nature of personal commitments, job pressures,

and responsibility to marriage and/or children which affect the amount of effort a student may devote to education. When comparing the success rates by full-/part-time status (Table 5), the cross tabulation revealed that while only 57.1% of the full-time students were successful, 70.4% of their part-time counterparts were able to receive a passing grade. The faculty member who taught the class being full- or part-time only appears to be an influence in the cases where students were assessed using the elementary algebra test, which incidently did not show any significant predictive ability. In none of the four stepwise multiple regression analyses did "curricula" enter the model.

Therefore, the null hypothesis must be accepted for "gender" in all four analyses, but rejected for "age" in all analyses except where the arithmetic skills test was used. The null hypothesis must be accepted for full- or part-time status of the student except in cases where the student was assessed using the McGraw-Hill reading test.

Further, for day or evening status of the student, the null hypothesis must be accepted in all four analyses. For full- or part-time status of the faculty, the null hypotheses must be accepted for all analyses except when the Elementary Algebra test scores were being used as an independent variable. Curricula was never entered into the model in any of the four analyses; consequently the null hypothesis must be accepted.

CHAPTER 5

Conclusions

Introduction

One purpose of this study was to assess the predictive ability of entry level placement tests in mathematics and reading as a predictor of final grades earned by students in Accounting 211 at Thomas Nelson Community College during the five consecutive semester terms beginning with summer semester in June 1988 and ending with the conclusion of the fall semester in December 1989. A secondary purpose of the study was to determine if other variables besides the assessment and placement tests might also have influence and/or predictive ability with reference to the final grades earned by the entering Accounting 211 students.

Testing had begun for all new entering students who were admitted for entry beginning in June 1988, and the focus of the assessment and placement program was to increase the students' probability of success in college credit courses by ascertaining the students' prior preparation as needed for specific courses before the student was approved to enroll in those specific courses. Students were encouraged to submit to the assessment and placement testing during the intake

process, but, in cases where students had taken less than 6 credit hours, the students were permitted to postpone the assessment process. As a result of this provision, it was possible for some new entering students to be enrolled in Accounting 211 without having been assessed. Those students were included in the non-assessed group for purposes of this study.

This particular study was designed to validate the requirement that the battery of placement tests be given to new students as a prerequisite to entering the Accounting 211 course and to ascertain if other factors had any significant influence on the predictive ability of the tests given. Accounting courses, traditionally, and particularly at Thomas Nelson Community College, have a very high attrition rate. The goal of using assessment and placement testing as a prerequisite of Accounting 211 is to lower that attrition rate and provide the student with a better probability of success due to the fact that he/she does not attempt accounting courses until he/she is prepared in the areas of mathematics and reading.

In addition to four assessment and placement tests evaluated (two mathematics and two reading tests which were in use), factors such as age, gender, curriculum, day/evening class enrollment, and the full-time or part-time status of both the students and faculty were included in the study. Using these independent variables in the analysis, the

following specific research questions were generated for consideration:

1. Is there a significant difference in the performance (successful or non-successful) of students who have been subjected to placement procedures from those who have not been subjected to placement procedures?

2. Is there a significant difference in the percentages of each letter grade received by students who have been assessed and those who have not been assessed?

3. Can mathematics and reading placement test scores be used to predict success in Accounting 211, and is there a correlation between placement scores and Accounting 211 grades?

4. Do other variables such as gender, age, day or evening student status, full- or part-time status of the student and/or faculty, or the curriculum in which the student is enrolled, significantly influence the predictive ability of the placement testing?

The population used in this study was that group of students who enrolled in Accounting 211 during the 19-month period beginning June 1988 and ending December 1989. Of that group of 1353 students, 481 students had been assessed by some means in the area of mathematics, and 540 students had been

assessed in the area of reading. The assumption was made that if a student scored poorly on either of these tests, that student would be advised to enroll in and complete skills building courses before enrolling in credit courses such as Accounting 211 which had been designated as those requiring at least a minimum entry level skill in the specific areas. Accordingly, the assumption was also made that by the mere fact that a student enrolled in Accounting 211 after having had placement examinations meant that the student had met the minimum qualifications either by qualifying score or actual skills building coursework prior to enrolling in the entry level accounting course.

Conclusions

The following are the conclusions drawn from the results of the analysis outlined in the methodology of Chapter 3 and the results of the study in Chapter 4.

1. The attrition rate in the Accounting 211 classes is not lower for the group of students who have been assessed and approved for entry into credit courses than for those students who have not been evaluated by the assessment and placement process.

2. The final grades of first semester accounting students who have had their entering skills evaluated by scores on the appropriate placement tests are not higher overall

than those of students whose entering skills have not been evaluated.

3. The arithmetic skills assessment and placement test appears to have a significant, though weak, predictive value in evaluating a student's projected outcome in the Accounting 211 course. However, the elementary algebra placement test, while possibly having predictive value in other courses, is unusable as a predictor of the final grade in Accounting 211. In the area of reading, both the McGraw-Hill Reading Test and the Comparative Guidance and Placement Program of the College Board were indicated to have some predictive ability with regards to the final grade in Accounting 211.

4. The final grades of Accounting 211 students are unrelated to gender, curriculum, and the day/evening/Saturday status of the student. There is a slight indication that in some instances, the full or part-time status of the student or the faculty member teaching the course does have some limited influence on the final outcome of the student's grade. Age of the student proved to be a slight, but significant, influence on the outcome in three out of four instances with the older students receiving the higher grades.

Interpretations and Implications

Even though the final grades of entering first semester Accounting 211 students who had been subjected to the assessment and placement procedure were not higher as expected, but lower than the grades of those Accounting 211 students who had not been assessed, the percentages of each grade earned by the two groups were very close. This similarity and near equality of the grades would appear to indicate that there is no significant difference in the final grade outcome of those students who have been assessed from those who have not. While this might further imply that assessment and placement have no value in promoting the success or non-success of Accounting 211 students, many other factors, not studied here, could influence its outcome. One of those factors could be that the minimum qualifying score is set too low for entry into the accounting courses. While the placement tests are required for entry into Accounting 211, the minimum qualifying score is a general one set by the appropriate mathematics or reading department to be used to evaluate the student's entry into general college level credit courses. Perhaps the minimum acceptable level should be raised and/or modified with respect to specific courses rather than a qualifying score allowing the student to automatically be admitted to any college credit course. Raising the minimum acceptable score would mean that those students who are marginally acceptable by the present standards would be

directed toward skills building courses before taking courses such as Accounting 211.

The conclusions with regard to the attrition rate are not only surprising but also indicate that assessment and placement seem to be having the opposite effect from the intended goal. The focus of the assessment and placement program (with regard to the accounting courses) was to assure that students were qualified and prepared to begin accounting at the college level. The implied goal was to increase the success rate (and decrease the attrition rate) of Accounting 211 students by restricting enrollment to those who had demonstrated an adequate level of proficiency in entering skills. In order to deter students from taking courses for which they do not have the required entering skills, counselors and advisors are instructed by Thomas Nelson's Dean of Instruction to:

List the courses approved for registration on the

(student's) Permit-to-Register card (Loland, 1988).

(Students may not register for classes not listed on the Permit-to-Register card and approved by a counselor or advisor authorized to sign the card.)

Students are prevented from enrolling in courses which the counselor has not approved until they have acquired the necessary entering skills. With this policy, students should be less likely to find it necessary to choose between withdrawal or failure. However, perhaps students have been

given a false sense of security in that by "passing" the placement test, the implication has been given that the student has all the entering skills necessary to succeed in the course. Indeed, this should be the implication to be expected. Perhaps the previous suggestion of raising the qualifying, or "passing" score, would help alleviate this problem which has been generated.

It is also possible that placement tests are predicting success accurately, but that the intense and difficult nature of the accounting course has a heavy influence on the attrition rate. Other factors, such as teaching methodology, may also be a significant factor in the success or failure of Accounting 211 students.

The predictive ability of each of the placement tests studied is indicated partly by each test's correlation with the final grade received by the student. The arithmetic skills test and the two reading tests show significant, though not overly strong, correlations with the student's final grade. Thus, while a higher score on the placement test might indicate to some extent the level of grade to be earned by the student when the accounting course has been completed, high placement scores are not strong enough indicators to be predictive of final grades by themselves.

Other than the assessment and placement tests, the most significant single variable which affects the final outcome of the student's grade appears to be age. Those students under

23 years old appear to have the least success of all the age groups in Accounting 211. The students over 23 years old are relatively consistent in their respective success rates with no group showing significant variance from the others. This would seem to indicate that the very young student lacks a significant attribute associated with maturity. Perhaps this attribute centers on life experiences, personal maturity, underdeveloped study skills, social life and/or motivation, none of which were included in this study.

The full- or part-time status of the student or faculty member was only mildly influential in the outcome of the student's grade. The status of the student or faculty member is perhaps related to commitment to the academic process rather than a measurable skill studied here.

Recommendations for Further Study

As previously stated, some of the ultimate goals of the assessment and placement process are to reduce the attrition rate of students and increase the ratio of successful students as opposed to the unsuccessful students or withdrawals. While the findings of this study do not confirm that this goal was met with regard to Accounting 211 in the first five semesters of mandatory assessment and placement, there appears to be a need for further study to determine what needs to be changed, if anything, in order that the goal may be met.

One of the areas of further study should be the re-examination of the reliability and validity of the tests being used in the assessment and placement process, especially to meet the needs of students at Thomas Nelson Community College. The reading tests described in this study, the McGraw-Hill Reading Test and the Comparative Guidance and Placement Program of the College Board, are nationally recognized tests for assessment, and their reliability and validity are widely established for general placement purposes. However, further study might include investigating the possibility of specialized use directed toward the particular needs of the students who attend Thomas Nelson Community College. Also, it should be noted that Thomas Nelson Community College has changed to another reading test, Degrees of Reading Power, as its primary measurement of reading ability. This switch was accomplished during the last semester of this study for students who would be entering the following semester.

The mathematics tests, arithmetic skills and elementary algebra, are administered based on cutoffs established by the mathematics department and are parallel to the skills building goals of the developmental classes currently being taught at Thomas Nelson Community College. The cutoff scores are based on the expected exit levels of students who take the developmental classes. If a student fails to score well on a mathematics placement test, the student is recommended to

enroll in the appropriate skills building remedial course before enrolling in courses which require those skills. A recommendation for further study would include a re-evaluation of the cutoff scores which indicate that the student has the necessary entering skills to perform well mathematically in credit courses.

Another area recommended for further study would include extracting more archive data to reveal any skills building and/or study skills courses which the student may have taken between the time he/she took the placement examination and the time he/she enrolled in Accounting 211. The instruments used for evaluation in these courses should be examined for their usefulness as a predictor of future success in subsequent courses. Perhaps some on the reason for the weak predictive ability of some of the tests could be explained by the fact that the student did in fact enroll in, and successfully progress in, skills building and/or study skills courses which allowed him/her to enroll in Accounting 211 with a better prospect of succeeding than would be apparent with only the placement scores available.

Mathematics skills and reading comprehension are the only current requirements for entry into Accounting 211. However, an assessment of logical thinking might prove to be a better predictor of success in this course. Recommended further study would include the search for a different, or additional,

placement test which measures this skill as well as reading or mathematical ability.

Perhaps the answer to raising the success rate of Accounting 211 students lies, not in the assessment of a student's prior learning and measurement of his/her entering skills, but in other methods of improving comprehension of course materials. Some of these methods might include changes in teaching methodology, changes in textbook materials, establishment of an accounting laboratory where the student can receive additional help, and/or more widespread use of the computer in both problem-solving and tutorials. Further study might be indicated to investigate how these methods have affected the success rate at other similar institutions.

APPENDIX A

APPENDIX A

Variables Code List

Variable	Code	Description
TERM	1	Summer 1988
	2	Fall 1988
	3	Spring 1989
	4	Summer 1989
	5	Fall 1989
AGE	1	Under 23
	2	23 - 27
	3	28 - 32
	4	33 - 37
	5	38 - 42
	6	43 - 47
	7	Over 47
GENDER	1	Male
	2	Female

RACE	1	Caucasian
	2	Black
	3	American Indian
	4	Oriental
	5	Spanish American
	6	Other
CURR	1	Accounting
	2	Business Administration
	3	Other Business Curricula
	4	Other Curricula
	5	No Curriculum Declared
PRIORNEW	1	Prior Enrolled Student
	2	New Student
DAYNIGHT	1	Day Student
	2	Evening Student
	3	Saturday Student
FTPTSTU	1	Full Time Student (more than 11 cr.)
	2	Part Time Student (less than 12 cr.)

FTPTFAC	1	Full Time Faculty
	2	Part Time Faculty

GRADENOW	1	F
	2	D
	3	C
	4	B
	5	A

SUCCUNS	1	Successful
	2	Unsuccessful
	3	Withdraw

YNMATH	1	Assessed for Math Placement
	2	Not Assessed for Math Placement

YNREAD	1	Assessed for Reading Placement
	2	Not Assessed for Reading Placement

M1SCORE		Score on the Arithmetic Skills Test

M2SCORE		Score on the Elementary Algebra Test

R1SCORE

Score on the McGraw-Hill Reading Test

R2SCORE

Score on the Comparative Guidance and Placement Program of the College Board Test

APPENDIX B

APPENDIX B

Demographics of Student Population

	Number (Percentage)
Total Population Sample:	1353 (100%)

Term Enrolled:

Summer 1988	97 (7.17%)
Fall 1988	457 (33.78%)
Spring 1989	245 (18.11%)
Summer 1989	109 (8.06%)
Fall 1989	445 (32.89%)

Age of Students:

Under 23	488 (36.07%)
23 - 27	317 (23.43%)
28 - 32	221 (16.33%)
33 - 37	146 (10.79%)
38 - 42	90 (6.65%)
43 - 47	62 (4.58%)
Over 47	29 (2.14%)

Gender of Students:

Male	407 (30.08%)
Female	946 (69.92%)

Race of Students:

Caucasian	956	(70.66%)
Black	344	(25.42%)
American Indian	4	(0.30%)
Oriental	23	(1.70%)
Spanish American	15	(1.11%)
Other	11	(0.81%)

Curriculum Major:

Accounting	91	(6.73%)
Business Administration	481	(35.55%)
Other Business Curricula	412	(30.45%)
Other Curricula	97	(7.17%)
No Curriculum Declared	272	(20.10%)

Prior or New Students:

Prior Enrolled Students	1004	(74.21%)
New Students	349	(25.79%)

Day or Evening Students:

Day Students	536	(39.62%)
Evening Students	761	(56.25%)
Saturday Students	56	(4.14%)

Full or Part Time Students:

        Full Time Students   364 (26.90%)

        (more than 11 cr.)

        Part Time Students   989 (73.10%)

        (less than 12 cr.)

Students Taught By:

        Full Time Faculty   818 (60.46%)

        Part Time Faculty   535 (39.54%)

Grades of Students:

        A   314 (23.21%)

        B   260 (19.22%)

        C   210 (15.52%)

        D   120 (8.87%)

        F   189 (13.97%)

        W   260 (19.22%)

Success of Students:

        Successful   904 (66.81%)

        Unsuccessful   189 (13.97%)

        Withdraw   260 (19.22%)

Mathematics Assessment:

     Assessed Students   481 (35.55%)

     Not Assessed Students   872 (64.45%)

Reading Assessment:

     Assessed Students   540 (39.91%)

     Not Assessed Students   813 (60.09%)

TABLES

Table 1

A Cross Tabulation of Gender by Race of
Student Population

Race	Male	Female	Total
White	295 21.80%	661 48.85%	956 70.66%
Black	94 6.95%	250 18.48%	344 25.42%
Amer. Indian	1 0.07%	3 0.22%	4 0.30%
Oriental	11 0.81%	12 0.89%	23 1.70%
Span. Amer.	5 0.37%	10 0.74%	15 1.11%
Other	1 0.07%	10 0.74%	11 0.81%
Total	407 30.08%	946 69.92%	1353 100%

Table 2

A Cross-Tabulation of Gender by Age of
Student Population

Age	Male	Female	Total
<23 %	152 11.2	336 24.8	488 36.1
23-27 %	95 7.0	222 16.4	317 23.4
28-32 %	61 4.5	160 11.8	221 16.3
33-37 %	48 3.6	98 7.24	146 10.8
38-42 %	19 1.4	71 5.2	90 6.7
43-47 %	25 1.8	37 2.7	62 4.6
>47 %	7 0.5	22 1.6	29 2.1
Total %	407 30.1	946 69.9	1353 100

Table 3

A Cross-Tabulation of Full-Time/Part-Time Students by Gender of Student Population

Gender	Full-Time	Part-Time	Total
Male %	135 10.0	272 20.1	407 30.1
Female %	229 16.9	717 53.0	946 69.9
Total %	364 26.9	989 73.1	1353 100

Table 4

A Cross-Tabulation of Full-Time/Part-Time Students by
Day/Evening/Saturday Status of
Student Population

	Full-Time	Part-Time	Total
Day %	293 21.7	243 18.0	536 39.6
Evening %	57 4.2	704 52.0	761 56.2
Saturday %	14 1.0	42 3.1	56 4.1
Total %	364 26.9	989 73.1	1353 100

Table 5

A Cross-Tabulation of Full-Time/Part-Time Students by
Successful/Unsuccessful/Withdraw of
Student Population

	Full-Time	Part-Time	Total
Successful %	208 15.4	696 51.4	904 66.8
Unsuccessful %	63 4.7	126 9.3	189 14.0
Withdraw %	93 6.9	167 12.3	260 19.2
Total %	364 26.9	989 73.1	1353 100

Table 6

A Cross-Tabulation of Mathematics Assessment by
Letter Grade of
Student Population

Grade	Assessed Mathematics	Not Assessed Mathematics	Total
A	110	204	314
%	8.1	15.1	23.2
B	85	175	260
%	6.3	12.9	19.2
C	75	135	210
%	5.5	10.0	15.5
D	36	84	120
%	2.7	6.2	8.9
F	75	114	189
%	5.5	8.4	14.0
W	100	160	260
%	7.4	11.8	19.2
Total	481	872	1353
%	35.6	64.4	100

Table 7

A Cross-Tabulation of Reading Assessment by
Letter Grade of
Student Population

Grade	Assessed Reading	Not Assessed Reading	Total
A	110	204	314
%	8.1	15.1	23.2
B	93	167	260
%	6.9	12.3	19.2
C	82	128	210
%	6.1	9.5	15.5
D	42	78	120
%	3.1	5.8	8.9
F	92	97	189
%	6.8	7.2	14.0
W	121	139	260
%	8.9	10.3	19.2
Total	540	813	1353
%	39.9	60.1	100

Table 8

A Cross Tabulation of Grade by Age of
Student Population

	A	B	C	D	F	W	TOTAL
<23 %	35 2.6	70 5.2	95 7.0	64 4.7	103 7.6	121 8.9	488 36.1
23-27 %	97 7.2	74 5.5	42 3.1	18 1.3	32 2.4	54 4.0	317 23.4
28-32 %	79 5.8	45 3.3	28 2.1	20 1.5	20 1.5	29 2.1	221 16.3
33-37 %	38 2.8	28 2.1	24 1.8	10 0.7	23 1.7	23 1.7	146 10.8
38-42 %	29 2.1	23 1.7	9 0.7	4 0.3	5 0.4	20 1.5	90 6.7
43-47 %	23 1.7	15 1.1	8 0.6	3 0.2	3 0.2	10 0.7	62 4.6
>47 %	13 1.0	5 0.4	4 0.3	1 0.1	3 0.2	3 0.2	29 2.1
TOTAL %	314 23.2	260 19.2	210 15.5	120 8.9	189 14.0	260 19.2	1353 100

Table 9

A Cross-Tabulation of Day/Evening/Saturday Students
By Age of
Student Population

Age	Day	Evening	Saturday	Total
>23 %	291 21.5	183 13.5	14 1.0	488 36.1
23-27 %	109 8.1	192 14.2	16 1.2	317 23.4
28-32 %	63 4.7	147 10.9	11 0.8	221 16.3
33-37 %	39 2.9	97 7.2	10 0.7	146 10.8
38-42 %	21 1.6	66 4.9	3 0.2	90 6.7
43-47 %	8 0.6	52 3.8	2 0.1	62 4.6
>47 %	5 0.4	24 1.8	0 0.0	29 2.1
Total %	536 39.6	761 56.2	56 4.1	1353 100

Table 10

A Cross-Tabulation of Successful/Unsuccessful/Withdraw by
Age of
Student Population

Age	Successful	Unsuccessful	Withdraw	Total
>23 %	264 19.5	103 7.6	121 8.9	488 36.1
23-27 %	231 17.1	32 2.4	54 4.0	317 23.4
28-32 %	172 12.7	20 1.5	29 2.1	221 16.3
33-37 %	100 7.4	23 1.7	23 1.7	146 10.8
38-42 %	65 4.8	5 0.4	20 1.5	90 6.7
43-47 %	49 3.6	3 0.2	10 0.7	62 4.6
>47 %	23 1.7	3 0.2	3 0.2	39 2.1
Total %	904 66.8	189 14.0	260 19.2	1353 100

Table 11

A Cross-Tabulation of Gender by Grade of
Student Population

Grade	Male	Female	Total
A %	88 6.5	226 16.7	314 23.2
B %	87 6.4	173 12.8	260 19.2
C %	60 4.4	150 11.1	210 15.5
D %	23 1.7	97 7.2	120 8.9
F %	54 4.0	135 10.0	189 14.0
W %	95 7.0	165 12.2	260 19.2
Total %	407 30.1	946 69.9	1353 100

Table 12

A Cross-Tabulation of Gender by
Successful/Unsuccessful/Withdraw Status of
Student Population

	Male	Female	Total
Successful %	258 19.1	646 47.8	904 66.8
Unsuccessful %	54 4.0	135 10.0	189 14.0
Withdraw %	95 7.0	165 12.2	260 19.2
Total %	407 30.1	946 69.9	1353 100

Table 13

A Cross-Tabulation of Full-Time/Part-Time Student Status
Prior/New Status of
Student Population

	Full-Time	Part-Time	Total
Prior Student %	282 20.8	722 53.4	1004 74.2
New Student %	82 6.1	267 19.7	349 25.8
Total %	364 26.9	989 73.1	1353 100

Table 14

A Cross-Tabulation of Successful/Unsuccessful by
Prior/New Status of
Student Population

	Successful	Unsuccessful	Withdraw	Total
Prior Student %	663 49.0	128 9.5	213 15.7	1004 74.2
New Student %	241 17.8	61 4.5	47 3.5	349 25.8
Total %	904 66.8	189 14.0	260 19.2	1353 100

Table 15

A Cross-Tabulation of Mathematics Assessed Students by
Prior/New Status of
Student Population

	Assessed Mathematics	Not Assessed Mathematics	Total
Prior Student %	217 16.0	787 58.2	1004 74.2
New Student %	264 19.5	85 6.3	349 25.8
Total %	481 35.6	872 64.4	1353 100

Table 16

A Cross-Tabulation of Reading Assessed Students by
Prior/New Status of
Student Population

	Assessed Reading	Not Assessed Reading	Total
Prior Students %	293 21.7	711 52.6	1004 74.2
New Students %	247 18.3	102 7.5	349 25.8
Total %	540 39.9	813 60.1	1353 100

Table 17

A Cross-Tabulation of Full-Time/Part-Time Faculty by
Day/Evening/Saturday Status of
Student Population

	Full-Time Faculty	Part-Time Faculty	Total
Day %	476 35.2	60 4.4	536 39.6
Evening %	342 25.3	419 31.0	761 56.2
Saturday %	0 0.0	56 4.1	56 4.1
Total %	818 60.5	535 39.5	1353 100

Table 18

A Cross-Tabulation of Day/Evening/Saturday Status by
Grade of
Student Population

Grade	Day	Evening	Saturday	Total
A %	72 5.3	232 17.1	10 0.7	314 23.2
B %	93 6.9	154 11.4	13 1.0	260 19.2
C %	88 6.5	112 8.3	10 0.7	210 15.5
D %	56 4.1	59 4.4	5 0.4	120 8.9
F %	86 6.4	95 7.0	8 0.6	189 14.0
W %	141 10.4	109 8.1	10 0.7	260 19.2
Total %	536 39.6	761 56.2	56 4.1	1353 100

Table 19

A Cross-Tabulation of Full-Time/Part-Time Faculty Status by
Full-Time/Part-Time Student Status of
Student Population

	Full-Time Faculty	Part-Time Faculty	Total
Full-Time Student	324	40	364
%	24.0	3.0	26.9
Part-Time Student	494	495	989
%	36.5	36.6	73.1
Total	818	535	1353
%	60.5	39.5	100

Table 20

A Cross-Tabulation of Full-Time/Part-Time Faculty Status by
Letter Grade of
Student Population

Grade	Full-Time Faculty	Part-Time Faculty	Total
A %	168 12.4	146 10.8	314 23.2
B %	144 10.6	116 8.6	260 19.2
C %	125 9.2	85 6.3	210 15.5
D %	69 5.1	51 3.8	120 8.9
F %	127 9.4	62 4.6	189 14.0
W %	185 13.7	75 5.5	260 19.2
Total %	818 60.5	535 39.5	1353 100

Table 21

A Cross-Tabulation of Mathematics Assessed Students by
Successful/Unsuccessful/Withdraw Status of
Student Population

	Assessed Mathematics	Not Assessed Mathematics	Total
Successful %	306 22.6	598 44.2	904 66.8
Unsuccessful %	75 5.5	114 8.4	189 14.0
Withdraw %	100 7.4	160 11.8	260 19.2
Total %	481 35.6	872 64.4	1353 100

Table 22

A Cross-Tabulation of Reading Assessed Students by
Successful/Unsuccessful/Withdraw Status of
Student Population

	Assessed Reading	Not Assessed Reading	Total
Successful %	327 24.2	577 42.6	904 66.8
Unsuccessful %	92 6.8	97 7.2	189 14.0
Withdraw %	121 8.9	139 10.3	260 19.2
Total %	540 39.9	813 60.1	1353 100

Table 23

Chi-Square Statistics
(with 2 degrees of freedom)

	Mathematics Assessment vs Successful/ Unsuccessful	Reading Assessment vs Successful/ Unsuccessful
Chi-Square	3.5115	16.0863
Probability Level	0.1728	0.0003
Pearson's Contingency Coefficient	0.0509	0.1084

Table 24

Stepwise Regression of GRADENOW
onto All Independent Variables
using M1Score

Variable Entered into Model	Step 1* M1Score
Simple R Squared	0.1039
Partial R Squared	0.1039
Simple Correlation	0.3223
Partial Correlation	0.3223
Probability Level	0.0001
F-Ratio	15.54
T-Value	3.9
Mean	26.44118
Standard Deviation	5.407491

*No other variable met the minimum significance level of 0.05 to be entered into the model.

Table 25

Stepwise Regression of GRADENOW
onto All Independent Variables
using M2Score

Variable Entered Into Model	Step 1 Age	Step 2* Ft/Pt/Fac
Simple R Squared	0.0817	0.0769
Partial R Squared	0.0522	0.0473
Simple Correlation	0.2858	0.2773
Partial Correlation	0.2285	0.2176
Probability Level	0.0251	0.0332
F-Ratio	6.72	6.72
T-Value	2.28	2.16
Mean	1.639175	1.319588
Standard Deviation	1.012274	.4687393

*No other variable met the minimum significance level of 0.05 to be entered into the model.

Table 26

Stepwise Regression of GRADENOW
onto All Independent Variables
using R1Score

Variable Enter into Model	Step 1 R1Score	Step 2 Age	Step 3* Ft/Pt/Stu
Simple R Squared	0.1157	0.0844	0.0737
Partial R Squared	0.1006	0.0482	0.0376
Simple Correlation	0.3402	0.2906	0.2715
Partial Correlation	0.3171	0.2195	0.1940
Probability Level	0.0000	0.0009	0.0194
F-Ratio	12.84	12.84	12.84
T-Value	4.4	3.4	2.4
Mean	17.60544	2.285714	1.55102
Standard Deviation	5.18874	1.485086	.4990906

*No other variable met the minimum significance level of 0.05 to be entered into the model.

Table 27

Stepwise Regression of GRADENOW
onto All Independent Variables
using R2Score

Variable Entered Into Model	Step 1 R2Score	Step 2* Age
Simple R Squared	0.0983	0.0587
Partial R Squared	0.0913	0.0442
Simple Correlation	0.3136	0.2422
Partial Correlation	0.3021	0.2102
Probability Level	0.0001	0.0109
F-Ratio	4.72	4.72
T-Value	4.0	2.6
Mean	25.36842	2.368421
Standard Deviation	6.449688	1.490296

*No other variable met the minimum significance level of 0.05 to be entered into the model.

BIBLIOGRAPHY

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BIBLIOGRAPHY

Access, Assessment, and Developmental Education in the Community College, (June/July, 1987), AACJC Journal, pp. 38-41.

Ahrens, Steve, (1980, Fall). Analysis and Classification of Entering Freshmen Mathematic Students Using Multiple Discriminate Function Analysis. Paper presented at the Annual Meeting of the Southern Association of Institutional Research, Louisville, KY.

Alternatives for Testing Maryland College Students (1984). Paper collected as part of the American Association for Higher Education Assessment Forum. (1984).

Bok, Derek, (1986). Higher Learning. Harvard University Press, Cambridge, Massachusetts.

Boyer, Ernest L., (1987). College   The Undergraduate Experience in America. New York, Harper and Row.

Calhoun, Annie Belle, et al. (1976). An Individualized Competence-Based Assessment Model. CAEL Institutional Report. Metropolitan State University. Cooperative Assessment of Experiential Learning Project, Princeton, N.J.

Carney, Myrna, & Geis, Lynna, (1981). Reading Ability, Academic Performance, and College Attrition. Journal of College Student Personnel, v22 n1 p55-59 Jan 1981. (ERIC Abstract: EJ240069).

Chatman, Steven P. (1985). The Relationship between Response Pattern Aberrance and Course Performance in Math Placement. Paper presented at the Annual Meeting of the American Educational Research Association (69th, Chicago, IL, March 31-April 4, 1985). This paper is based, in part on a doctoral dissertation, Texas A & M. University, 1984.

Cohen, Arthur M., & Brawer, Florence B., (1984). The American Community College. San Francisco: Jossey-Bass.

Dwinell, Patricia L. (1985, March-April). The Validation of Variables Used in the Placement and Prediction of Academic Performance of Developmental Students. Paper presented at the Annual Meeting of the American Educational Research Association (69th, Chicago, IL. March 31-April 4, 1985).

Enteman, Willard F., & Jackson, Pamela I., (1986). Improving Undergraduate Education with Value-Added Assessment. Paper presented at a conference on Value-Added Learning: New Strategies for Excellence and Training (Saratoga Springs, NY, June 4-6, 1986).

Evangelauf, Jean, (1985). Sophomores in Fla. Public Colleges Must Pass a New Test of Their Academic Skills. Chronicle of Higher Education; v30 n18 p10 Jul 3, 1985.

Ewell, Peter, (1985). Assessing Educational Outcomes (New Directions for Institutional Research). Jossey-Bass, San Francisco.

Ewell, Peter, (1984). The Self-Regarding Institution: Information for Excellence. NCHEMS Executive Overview. Executive overview prepared for the National Institute of Education Study Group on the Conditions of Excellence in American Higher Education.

Forrest, Aubrey, (1977). Assessing Prior Learning--AA CAEL Student Guide. Cooperative Assessment of Experiential Learning, Columbia, MD.

Franco, Juan N. & Kaczmarek, Margaret, (1981). The ACT Assessment as a Predictor of College Performance for Mexican Americans. Journal of the NAWDAC; v45 n1 p17-19 Fall 1981. (ERIC Abstract EJ253591).

Funk & Wagnall's (1974). Standard Desk Dictionary, Funk & Wagnalls, Inc. New York.

Garcia, R., & Romanik, D. (Eds.) (1984). Volume II:2 Prescriptive Education. In J. Preston (Ed.), Miami-Dade Community College 1984 institutional self-study. Miami: Miami-Dade Community College.

Hanford, George H. (1986). [Testimony before the National Governor's Association Task Force on College Quality (Washington, D.C., February 22, 1986).] Paper collected as part of the American Association for Higher Education Assessment Forum.

Harris, John, (1985). Assessing Outcomes in Higher Education: Practical Suggestions for Getting Started. Paper presented at the National Conference on Assessment in Higher Education, sponsored by the American Association for Higher Education, (Columbia, SC, October 13-15, 1985).

Hollander, T. Edward, (1985). College Outcomes Evaluation Program. Paper collected as part of the American Association for Higher Education Assessment Forum. 1985.

Hutchings, Pat. & Reuben, Elaine (1988). Faculty Voices on Assessment, Changes (July/August, 1988).

Kaczka, Eugene, and Singer, Frank, (1977). Acceptance Testing--Course Readiness Measurement. Paper presented at the Annual Meeting of the Northeast Regional Conference of the American Institute for Decision Sciences (6th, Albany, New York, April 28, 1977.)

Knapp, Joan, (1977). Assessing Prior Learning--A CAEL Handbook Cooperative Assessment of Experiential Learning, Columbia, MD.

Livingston, Samuel A., (1986). The MAPS Placement Research Service. Paper presented at the Annual Meeting of the National Council on Measurement in Education (San Francisco, CA, April 17-20, 1986).

Loland, Vern, and Wheelan, Belle, (1988) Memorandum #82, Student Assessment and Placement Policy and Procedures, July 15, 1988.

MacDonald, A. M., Editor, (1972). Webster's Dictionary, new edition, Pyramid Communications, Inc., New York.

Marchese, Theodore J., (1987). Third Down, Ten Years to Go, AAHE Bulletin, December, 1987.

McCauley, Lynne (1987). Intellectual Skills Development Program. Annual Report. 1986-1987. Western Michigan University, Michigan.

Morris, Lynn L, & Fitz-Gibbon, Carol T., (1978). How to Measure Achievement. Sage Publications, Beverly Hills.

National Institute of Education Involvement in Learning: Realizing the Potential of American Higher Education. (1984). Final Report of the Study Group on the Conditions of Excellence in American Higher Education. Washington, D. C., U.S. Government Printing Office.

Noble, Julie, (1985). Estimating Reading Skill from ACT Assessment Scores. Research Report No. 88. American College Testing Program, Iowa City, IA.

Perkins, Dorothy, (1984). Assessment of the Use of the Nelson Denny Reading Test. Forum for Reading; v15 n2 p64-69 Spr-Sum 1984. (ERIC Abstract ED251792).

Roueche, John E. & Baker, George A., III. (1987). Access & Excellence: The Open Door College. Washington, D. C.: The Community College Press.

Roueche, John E. (1987). Open Door or Revolving Door, Community Technical and Junior College Journal, Vol. 57, No. 5 (April-May 1987), p. 24.

Schroeder, Charles C. (1988). Student Affairs - Academic Affairs: Opportunities for Bridging the Gap. ACPA Developments, Fall, 1988.

Stephens, L., Wileman, S., Konvalina, J., & Teodoro, E.V. (1985). Procedures for Improving Student Placement in Computer Science. Journal of Computers in Mathematics and Science Teaching; v4 n3 p46-49 Spr 1985.

Strachan, Alan, (1984). Bridging the Gap between School and College: Evidence from the University of Leicester 1978-82. Journal of Geography in Higher Education; v8 n2 p125-35 1984 (ERIC Abstract EJ312802).

Suddick, David E. & Collins, Burton A., (1984). A Longitudinal Study of the English Usage and Algebra Basic Skills Testing Remediation Paradigm for Older, Masters' Level Students. Paper presented at the Annual Meeting of the Midwestern Educational Research Association (Chicago, IL. September, 1984).

The Growth of a Model College. King's College. A Report of the President, 1986 Paper collected as part of the American Association for Higher Education Assessment Forum.

Turner, Daniel S., & Gerardo, Alex, (1983). Capping Enrollment: A Search for Objective Criteria. Engineering Education; v73 n8 p799-802 May 1983.

Weber, Jerry. (1985-1986). Assessment and Placement: A Review of the Research. Community College Review. 13 (3), 21-32.

Whitman, Neal A., & Schwenk, Thomas L., (1984). Preceptors as Teachers: A Guide to Clinical Teaching., Utah University, Salt Lake City.

Wilson, Russell C. and Davis, Paul D., (1985). The Prediction of Success in Engineering Graphics using the Group Embedded Figures Test and the Hidden Figures Test. Journal of Studies in Technical Careers; v7 n2 p65-72 Spr 1985. (ERIC Abstract EJ323087).

Vita

Sonja Ann Villaire

Birthdate: August 12, 1943

Birthplace: Colbert, Georgia

Education:

1984-1987	The College of William and Mary Williamsburg, Virginia Educational Specialist
1976-1977	Mississippi University for Women Columbus, Mississippi Master of Science, Business Administration
1975-1976	Mississippi University for Women Columbus, Mississippi Bachelor of Science, Accounting
1971-1973	Christopher Newport College Newport News, Virginia
1961-1962	University of Georgia Athens, Georgia

Certification:

Certified Public Accountant
Florida Certificate # 10949, Issued April 1982