December 1982

The Relationships Among Selected Variables of University and Teacher Education Admission Criteria and Scores on the Common Examination of the National Teacher Examination

Christine M. Ejlali

East Tennessee State University

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THE RELATIONSHIPS AMONG SELECTED VARIABLES OF UNIVERSITY AND TEACHER EDUCATION ADMISSION CRITERIA AND SCORES ON THE COMMON EXAMINATION OF THE NATIONAL TEACHER EXAMINATION

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A Dissertation
Presented to
the Faculty of the Department of Supervision and Administration
East Tennessee State University

In Partial Fulfillment of the Requirements for the Degree Doctor of Education

by
Christine M. Ejlali
December, 1982
APPROVAL

This is to certify that the Graduate Committee of

CHRISTINE S. BJLALI

met on the

15\textsuperscript{th} day of \textbf{November}, 1982.

The committee examined her dissertation, supervised her defense of it in an oral examination, and decided to recommend that her study be submitted to the Graduate Council and the Dean of the School of Graduate Studies in partial fulfillment of the requirements for the degree Doctor of Education.

\underline{W.M. Mofford}  
Chairman, Graduate Committee

\underline{J. Fred Brown}  

\underline{Robert H. Megard}  

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\underline{Signed on behalf of the Graduate Council}  
\underline{Elizabeth L. McPhail}  
Dean, School of Graduate Studies
Abstract

THE RELATIONSHIPS AMONG SELECTED VARIABLES OF UNIVERSITY AND TEACHER EDUCATION ADMISSION CRITERIA AND SCORES ON THE COMMON EXAMINATION OF THE NATIONAL TEACHER EXAMINATION

by

Christine Sosnowski Ejlali

The problem of this study was to determine the relationships among selected predictor variables in order to identify the combination of variables which best predicts scores on the National Teacher Examination-Weighted Common Examination Total Score.

The identified variables were sex, teaching level, ACT composite scores, teacher education admission grade-point averages, CAT scores in Reading, Mathematics, and English, and Professional Education sequence grade-point averages.

Nine hypotheses comprised the basis of this study. The first eight hypotheses pertained to the bivariate relationship of each predictor variable and the NTE-WCET scores. Hypothesis nine concerned the relationships of the combination of the predictor variables to the NTE-WCET scores.

The 99 subjects of this study were drawn from 186 applicants for initial teaching certification in Tennessee during the 1981 calendar year. Selection was dependent upon the subjects having the grade-point averages and scores used as variables recorded and reported to East Tennessee State University.

Pearson product-moment and point-biserial correlations were used to determine the relationship between each predictor and the criterion. Multiple regression analysis was used to determine the combination of variables which correlate significantly with the NTE-WCET scores. The .05 level was considered in determining significance.
Analysis of the relationship of predictors with the NTE-WCET scores revealed that sex and teaching level did not correlate significantly. ACT composite scores, CAT Reading scores, CAT Math scores, CAT English scores, teacher education admission grade-point averages, and Professional Education sequence grade-point averages correlated significantly at the .0001 level. ACT composite score and CAT Reading scores shared the greatest common variance with NTE-WCET scores at 74.23 percent and 61.88 percent respectively.

Analysis of a significant correlation between the NTE-WCET scores and a combination of all eight predictors showed a significant correlation at the .0001 level. Analysis of the significance of each predictor to the $R^2$ increase showed that ACT composite scores, CAT Reading scores, and CAT English scores were significant at the .05 level.
DEDICATION

Dedicated to Majid, Kiki and Kara, who supplied the encouragement, emotional support and love essential for the completion of this study.
ACKNOWLEDGMENTS

Special appreciation is extended to the chairman of my doctoral committee, Dr. William N. Pafford, who provided encouragement, inspiration, and guidance on my dissertation, as well as continuing friendship and support in my educational endeavors.

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Special appreciation is expressed to the Johnson City School Board and the Johnson City Education Association for
providing a sabbatical leave which enabled the author to undertake and complete the study.

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Chapter 1

THE INTRODUCTION

The old saw, "Teachers are born not made," has a modern counterpart, "Teachers are born to be made." The implications of this revised adage are that teaching skills, actions, and knowledge are not innate, but learned behaviors. The degree to which these behaviors are learned and applied determine the effectiveness and competence of the teacher. This behavioristic approach, usually associated with Competence or Performance Based Teacher Education (CBTE or PBTE), has recently manifested itself in the form of state mandated tests of minimum competence for teachers.

A. S. Barr stated that one must be able "to identify the personal, academic, and professional prerequisites to effectiveness."\(^1\) "The early appraisal of teaching potential is endorsed by both humane and professional considerations," Maurice Freehill indicated, "but making these assessments continues to be a very difficult

assignment."² Obvious inadequacies in intelligence, subject matter, and personality may eliminate a small portion of candidates, but those who possess limitations which are less obvious may result in the certification of ineffective and incompetent teachers. Identification of these limitations is essential "... to distinguish between degrees of competence and incompetence."³

The prerogative of establishing criteria for selection, retention, education, and recommendation of candidates for the teaching profession is vested with directors of teacher education programs in higher education institutions. A survey by Allen Warner⁴ indicated a deviation from this practice, as state agencies for Teacher Education and Certification increase their involvement in this area as a result of legislative or State Board of Education mandates. The Southern Regional Education Board's study in 1980 identified five new practices affecting teacher education and certification in member states. The practices were:

1. Addition of test requirements at or near the end of the Bachelor's program.

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³Freehill, p. 5
2. Tests of basic skills required for admission to teacher education.
3. Lengthening the probationary period.
5. Coupling in-service programs with the probationary and evaluation period.\(^5\)

Tennessee's use of a minimum competency test for teachers was initiated on November 10, 1977. A resolution adopted that year by the State Board of Education required applicants for teacher preparation programs to demonstrate competency in verbal and quantitative skills by attaining a specific score on a standardized test approved by the State Board of Education.\(^6\)

Approval of the Common Examination and Area tests of the National Teacher Examination as a requirement for initial certification was granted at a State Board of Education meeting on November 9, 1979. The established commencement date for this requirement was January 15, 1981. The Area tests were later deleted as a requirement, since there were more areas of certification than NTE-Area tests. A cut-off score on the National Teacher Examination


was not determined, but it was anticipated that one would be established in the future.\(^7\)

The establishment of a cut-off score on the Common Examination of the National Teacher Examination will provide a final screening process to eliminate teacher candidates deficient in cognitive skills. The requirement of a specific score on an exit examination will create the possibility that an education major could complete four years of study, complete the professional course requirements, demonstrate teaching proficiency, and still not obtain certification. The feasibility of such an occurrence indicated the necessity of early identification of students who may not score at the acceptable level. Early identification allows sufficient time for remedial instruction or aid in finding a new goal. M. Ohlsen indicated, "The longer he remains in the program, the more traumatic will be his failure and the more difficult it will be for him to find a new goal with a minimum of lost time."\(^8\) It seemed reasonable to assume that a significant contribution to teacher education in Tennessee could be made by conducting studies that would help identify

\(^7\)Memorandum from Edward A. Cox, Chairman, Tennessee State Board of Education, January 17, 1980.

variables in admission requirements which could reasonably predict scores on the National Teacher Examination.

The Problem

Statement of the Problem

The problem of this study was to determine the relationships among selected predictor variables in order to identify the combination of variables which best predicts scores on the National Teacher Examination-Weighted Common Examination Total Score.

Purpose of the Study

The purpose of this study was to determine the relationships among selected predictor variables with the National Teacher Examination-Weighted Common Examination Total Score. The results of this determination will identify variables and combinations of variables which will best predict scores on the National Teacher Examination-Weighted Common Examination Total at East Tennessee State University.

Significance of the Study

The study was significant for the following reasons. The results of the study will:

1. Provide the data essential to formulate a prediction equation, which can be used in the selection of teacher candidates at East Tennessee State University.
2. Assist teacher educators at East Tennessee State University in evaluating course requirements and content.

3. Establish an early identification system for students who may not be successful on the National Teacher Examination, therefore allowing adequate time for remediation or vocational counseling.

4. Provide information on candidate selection that might be useful to other teacher preparatory institutions in Tennessee.

5. Provide a data base and structure for further studies in this area.

Limitations

The study was subject to the following limitations:

1. Graduating seniors during the 1981 calendar year at East Tennessee State University who were seeking initial teaching certification in Tennessee.

2. Students in the 1981 graduating class who took the National Teacher Examination-Weighted Common Examination (NTE-WCET) during the 1981 calendar year and had recorded scores for the reading, mathematics, and English sections of the California Achievement Test (CAT), Form C-Level 19, and for the Scholastic Aptitude Test (SAT) or American College Test (ACT) assessment.

Assumptions

The assumptions upon which this study was based were:
1. Grade-point averages on work prior to teacher education admission, and on work in the professional education sequence courses were representative of achievement in these areas.

2. The procedures utilized in the administration of the National Teacher Examination, California Achievement Test, American College Test, and Scholastic Aptitude Test were consistent with established procedures used previously.

3. The standardized norms for the National Teacher Examination, California Achievement Test, College Aptitude Test, and Scholastic Aptitude Test were based on groups that possessed characteristics similar to the population in this study.

4. The grading practices of instructors and professors were consistent.

5. The final scores recorded for the required subtests on the California Achievement Test were representative of the student's achievement on these subtests.

Research Questions

The following research questions were formulated for this study:

1. What combination of predictor variables will best predict scores on the Common Examination of the National Teachers Examination (NTE-WCET)?
2. Does the addition of the variable sex add significantly to the regression model?

3. Does the addition of the variable teaching level add significantly to the regression model?

Research Hypotheses

The following hypotheses were formulated for this study:

$H_1$: There will be a significant correlation between sex and the NTE-WCET scores.

$H_2$: There will be a significant correlation between teaching level and the NTE-WCET scores.

$H_3$: There will be a significant correlation between the ACT composite scores and the NTE-WCET scores.

$H_4$: There will be a significant correlation between the teacher education admission grade-point average and the NTE-WCET scores.

$H_5$: There will be a significant correlation between the CAT Reading scores and the NTE-WCET scores.

$H_6$: There will be a significant correlation between the CAT Math scores and the NTE-WCET scores.

$H_7$: There will be a significant correlation between the CAT English scores and the NTE-WCET scores.

$H_8$: There will be a significant correlation between the Professional Education Sequence grade-point average and the NTE-WCET scores.
H₉: The combination of the variables sex, level, ACT composite score, teacher education admission grade-point average, CAT Reading score, CAT Math score, CAT English score, and Professional Education sequence grade-point average will correlate significantly with NTE-WCET scores.

Definitions of Terms

For the purposes of this study, the following definitions of terms were utilized:

**Achievement Test:** An achievement test is "a test designed to measure a person's knowledge, skills, understandings, etc., in a given field taught in school, for example a mathematics or an English test."⁹

**American College Test (ACT):** The ACT is a set of four cognitive tests—English usage, mathematics usage, social studies, reading, and natural science reading. The tests yield five scores, one for each test area and a composite score computed as a mean of the four subscores. The battery is administered through the American College Testing Program and measures the abilities of the students in basic academic areas.¹⁰

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Aptitude Test: An aptitude test is "a device used to assess a combination of native and acquired abilities which are considered indicative of future performance."^11

California Achievement Test (CAT): The California Achievement Test (Form C-Level 19) 1977 edition was used in this study.

The CAT mathematics computation scores, test 6, were the raw scores from Form C-Level 19. The maximum raw score was 40.

The CAT reading comprehension scores, test 2, were the raw scores on Form C-Level 19. The maximum raw score was 40.

The CAT English scores were the combined raw scores for language mechanics, test 4, and language expression, test 5, on Form C-Level 19. The maximum raw score was 25 for language mechanics and 38 for language expression. The maximum combined raw score was 63.

Grade-Point Average (GPA): Grade-point average is:

A measure of average scholastic success in all school subjects taken by a student during a certain term or semester, or accumulated for several terms or semesters; obtained by dividing grade points by hours of course work taken when course work is weighted by some such system....12

The college grade-point averages used in this study were based on the following system:


^12 Good, p. 263.
A = 4.00, B = 3.00, C = 2.00, D = 1.00, and F = 0.00.13

**National Teacher Examinations (NTE):** The National Teacher Examinations (NTE) are standardized, secure tests that provide objective measures of academic achievement for college seniors completing teacher education programs....14

**National Teacher Examination—Common Examinations:** The Common Examinations are divided into four tests covering two areas: professional education and general education. Professional education includes questions related to the social and cultural forces that influence curriculum and teaching as well as the general principles of learning and instruction. General education is divided into three tests: Written English Expression; Social Studies; Literature, and the Fine Arts; and Science and Mathematics.15

**Professional Education Sequence:** The professional sequence includes those professional education courses, excluding Directed Student Teaching, required by East Tennessee State University for Tennessee certification

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15Educational Testing Service, p. 5.
recommendation. All students majoring in education are required to take the following courses.

(506) 3300 -- The School I
(506) 3301 -- The School II
(513) 3310 -- Educational Psychology
(513) 3320 -- Introduction to Special Education
(513) 2320/2330 -- Child Psychology or Adolescent Psychology
(506) 4581 -- Resources for Teaching

In addition to the core courses Elementary Education majors must take:

(506) 3400 -- Elementary Methods in English Language
(506) 3420 -- Elementary Methods in Social Studies
(506) 3430 -- Elementary Methods in Mathematics

Secondary education majors are required to take the following courses, in addition to the core requirement:

(506) 4400 -- High School Teaching Methods
(506) 4419 -- Methods in Area of Concentration

Scholastic Aptitude Test (SAT): The Scholastic Aptitude Test of the College Entrance Examination Board Admissions Testing Program is a three-hour test administered and scored by the Educational Testing Service which

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16East Tennessee State University 1982-83 Undergraduate Catalog, pp. 110-112.
primarily measures two areas; verbal and mathematical ability.\textsuperscript{17}

**Teacher Education:** Teacher education is:

The program of activities and experience developed by an institution responsible for the preparation and growth of persons preparing themselves for educational work or engaging in the work of the educational profession.\textsuperscript{18}

**Weighted Common Examinations Total (WCET):** The WCET is based on:

Each of the four tests that comprise the Common Examinations (portion of the NTE) is weighted in accordance with professional judgment regarding its relative importance in preservice teacher education programs.\textsuperscript{19}

**Procedures**

A thorough search of the literature was conducted on the selected study topic in the resources available at the East Tennessee State University Library. This search was further facilitated by an ERIC search, using the Dialog System, and materials available through interlibrary loan.

Having deemed the subject researchable, an appropriate research design was written and the data pertinent to this study were collected. The method of collection entailed:


\textsuperscript{18}Good, *Dictionary of Education*, p. 586.

1. Obtaining a list of ETSU Seniors who applied for initial certification in Tennessee from the College of Education during 1981.

2. Acquiring the NTE scores from the College of Education and the grade-point averages, ACT or SAT scores, and CAT scores from the official records maintained by the Office of Admissions and Records.

3. Converting SAT total scores to equivalent ACT composite scores.

4. Calculating the Professional Education sequence grade-point average.

The data collected were entered on a summary chart and the subjects were assigned arbitrary numbers to maintain anonymity. The data were coded and entered into the IBM 4341 at the East Tennessee State University Data Processing Center. The correlation and stepwise procedures of the Statistical Analysis System (SAS) were used to treat the data.

**Organization of the Study**

The study is organized into five chapters:

Chapter 1 includes the introduction, statement of the problem, purpose, significance, limitations, assumptions, hypotheses, definitions of terms, procedures, and organization of the study.

Chapter 2 includes the review of the literature and research related to the problem statement.
Chapter 3 contains the methodology and procedures of the study. Included are the description of the study, description of the population, description of the instruments, collection and treatment of data.

Chapter 4 includes the presentation and analysis of the data collected in the study.

Chapter 5 contains the summary, conclusions, and recommendations.
Chapter 2

REVIEW OF LITERATURE

Introduction

The purpose of this chapter was to summarize research and literature relevant to this study. The review was categorized into six areas to facilitate the search:

1. Student Selection Procedures for Colleges and Universities;
2. Student Selection for Teacher Education Programs;
3. Status of Competency Testing for Teacher Certification;
4. Literature Related to the National Teacher Examination;
5. Studies Related to Predicting National Teacher Examination Scores; and

Student Selection Procedures for Colleges and Universities

Nationwide an increasing number of colleges and universities have raised academic entrance requirements for incoming freshmen over the past year and many others are considering similar changes in their admission standards.\(^1\) McCurdy indicated that the promotion of tightening entrance standards was due in part to the financial strain placed upon higher education, but

"... by far the dominant motivation is to improve the capability of incoming students."²

Increasing the selectivity in college and university admissions may be viewed as a reaction to the "open door" admissions policy which had dominated the preceding two decades. For the purpose of clarification, admission procedures at undergraduate colleges were grouped in three categories:³

1. Open door—Those colleges which enroll all high-school graduates who apply.

2. Selective—Those colleges which admit applicants who probably will be able to succeed in college. This probability is based upon additional requirements or qualifications for admission.

3. Competitive—Those colleges which admit only a limited number of applicants who meet specified levels of academic achievement or other qualifications.

Henry Dyer contended that all institutions of higher education were selective to some extent.⁴ The very nature of an admission policy established selectivity, since it described the numbers and kinds of applicants accepted.

² McCurdy, p. 547.


"Open-door" policies that required high-school graduation or its equivalent were selective to a minimal degree. Categorization was, therefore, dependent upon the degree of selectivity.

A report by the American Association of Collegiate Registrars and Admissions Officers and the College Board confirmed the emphasis upon selective undergraduate admission practices by colleges. According to the study, 56 percent of the 1,463 institutions surveyed admitted a majority of the applicants who met specified levels of achievement or qualification beyond high-school graduation. Among four year institutions, 70 percent of the public and 77 percent of the private institutions utilized selective practices. Among two year institutions, the span widened as 9 percent of the public institutions and 60 percent of the private institutions indicated the use of selective practices.

Only 34 percent of all the institutions admitted applicants in an "open door" policy and of this number 89 percent of all two year public institutions qualified. Competitive admission policies were employed by 8 percent

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of all institutions with private institutions accounting for the larger portion of this percentage.\textsuperscript{6}

Three characteristics and credentials considered important factors in admission decisions were high school academic performance, aptitude test scores, and patterns of high school subjects. The first two factors were frequently used by colleges to determine the applicant's potential for academic success. Singly or in combination high school academic performance and aptitude test scores were inserted into mathematically derived prediction systems to estimate the applicant's freshman grade-point average.\textsuperscript{7}

The use of academic prediction systems in collegiate admission became prevalent soon after World War II. The establishment and development of prediction systems coincided with the marked increase in the number of college students. In 1950 there were approximately 2.3 million college students and by 1978 enrollments had risen to 11.4 million, an unprecedented increase of 396 percent.\textsuperscript{8}

The earliest attempt to establish a collegiate prediction system was credited to Paul Horst in 1949 at the University of Washington. His two techniques, multiple

\textsuperscript{6}American Association of Collegiate Registrars and the College Board, p. 8.

\textsuperscript{7}American Association of Collegiate Registrars and the College Board, p. 8.

\textsuperscript{8}O'Hearne, p. 27.
absolute prediction and differential prediction, were devised to predict an applicant's success in specific major fields.⁹

Horst's early efforts were followed by similar prediction systems developed by the University System of Georgia and a CEEB guided program in Indiana. These two systems differed from Horst's by predicting overall grade-point averages for public institutions within their respective states.¹⁰

Prediction systems operated on the basis of three assumptions: (1) that the academic demands of different colleges were measurable; (2) that students' abilities to meet these demands were measurable; and (3) that the degree of accuracy in these systems was sufficiently reliable.

A literature search revealed that high school grades were the best single predictor of college grades. The average correlation between high school academic performance and first year college grades was around .50 to .55.¹¹

⁹Paul Horst, "The Differential Prediction of Success in Various College Course Areas," College and University, XXXI (Summer, 1956), 456-71.


J. L. Holland and A. W. Astin confirmed high school grade-point averages as the best predictors of collegiate academic achievement, especially when students rated themselves high in the area of scholarship.\textsuperscript{12}

High school rank and academic achievement were found to be accurate predictors in C. H. Swenson's study. Significantly higher grades at the end of the first college semester were recorded for students in the upper two-fifths of a high school graduating class than for students in the lower three-fifths of the class, despite the lack of difference between the two groups on standardized aptitude tests.\textsuperscript{13}

J. R. Hills found the multiple correlation was raised from .05 to .10 points when scholastic aptitude tests were added as predictors. The variation depended upon the type of institution and homogeneity of the student body.\textsuperscript{14}

C. Fincher's studies of 19 colleges within the University System confirmed Hills' findings. He found that the predictive efficiency for males was increased by

\begin{itemize}
\end{itemize}
46 percent and for females by 43 percent when the Scholastic Aptitude Test was used in addition to high school grade-point average. Fincher utilized the index of the magnitude of the incremental validity to information obtained by multiple and partial correlation techniques.\(^{15}\)

G. Halpin, G. Halpin, and B. Hauf examined the effectiveness of the ACT in increasing the validity obtained from using only high school grade-point averages in predicting success in a 3-year program. Employing the index of forecasting efficiency in addition to multiple correlation procedures, the investigators found that they obtained an increase in predictive power greater than 100 percent for each of the three years ACT was used to supplement high school grade-point averages.\(^{16}\)

L. Aleamoni and L. Oboler found that ACT did not appear to predict first semester college grade-point average anymore accurately than did SAT. The best single predictor was high school percentile rank which accounted for more

\(^{15}\)C. Fincher, "Is the SAT Worth Its Salt? An Evaluation of the Use of Scholastic Aptitude Tests in the University System of Georgia Over a Thirteen Year Period," Review of Educational Measurement, XLIV (Summer, 1974), 293-305.

\(^{16}\)G. Halpin, G. Halpin, and B. Hauf, "Incremental Validity of the ACT Test Battery for Predicting Success in a School of Nursing Over a 10 Year Period," Educational and Psychological Measurement, XXXVI (Summer, 1976), 433-37.
than 18 percent of the variance in first semester college grade-point average.17

O. T. Lemming and E. J. Maxey conducted a study under the auspices of the ACT Standard Research Service concerning the efficiency of the ACT and SAT as predictors of overall college grade-point average. Within the seventeen schools included in the study, they found the ACT tests were as efficient predictors as were the SAT tests. Their study also uncovered a relationship between the effects of each test as accurate predictors of college grade-point average; if the accuracy of prediction was relatively low for one battery it was also generally modest for the other test battery.18

A recent trend in predictive studies was the utilization of tests other than standardized aptitude tests. One such area investigated was the use of standardized achievement tests. Harvard's Dean K. Whitla, director of the office of instructional research and evaluation, has reported that achievement tests were more reliable than high school grades or SAT scores in the prediction of first year student performance in college. Student applicants were required to submit SAT scores and

17Lawrence M. Aleamoni and Linda Oboler, "ACT Versus SAT in Predicting First Semester GPA," Educational and Psychological Measurement, XXXVIII (Summer, 1978), 393-399.

any three of the fourteen achievement tests administered by the CEEB.19

G. Halpin, G. Halpin, and B. B. Schaer confirmed the effectiveness of standardized achievement tests in predicting college freshman grade-point average. High school grade-point average, ACT scores, SAT scores, and the CAT (California Achievement Test) were correlated with college freshman grade-point average. The resulting bivariate correlation coefficients were ACT .37, SAT .42, CAT .38, and high school grade-point average .49. As indicated, high school grades predicted college grades more validly than did the ACT, SAT, or CAT. The multiple correlation coefficient was .53 for the combined predictors of high school grade-point average and each of the tests, thus substantiating that the ACT, SAT, and CAT possessed the same incremental validity of about 18.5 percent.20

The following review of literature clearly indicated that the single best predictor of collegiate achievement was the high-school grade-point average. The addition of standardized tests to the high school grade-point average


20G. Halpin, G. Halpin, and B. B. Schaer, "Relative Effectiveness of the California Achievement Tests in Comparison with the ACT Assessment, College Board Scholastic Aptitude Test, and High-School Grade-Point Average in Predicting College Grade-Point Average," Educational and Psychological Measurement, XLI (Autumn, 1981), 821-7.
tended to increase the multiple R positively, but the degree of increase and the effects of varied standardized tests have not been definitely determined.

**Teacher Education Selection**

Over four decades ago A. L. Kandall of Columbia University urged the educational profession to reexamine its preparation methods and status. Reexamination was essential, he stated, not only to assess the advancement of knowledge, but because of the changes in professional practices. Adjustment to these changes involved more than "providing more time for the acquisition of the basic knowledge for entrance into a profession. They involve increasingly a consideration of the aptitudes of prospective candidates."  

Concern about the abilities and aptitudes of prospective teacher candidates did not diminish during the ensuing forty years since Kandall's remarks. The concern tended to fluctuate with the supply and demand for educators; finally in the 1980's, it manifested itself in the legislative standardization of teacher education admission requirements in specific states. This reaction appeared to be limited primarily to the Southeastern and

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South Central States, but the repercussion of these actions was felt in all States.

The selection-retention policies and practices in teacher education have evolved in three historical stages according to H. A. Brubaker. First stage requirements (1839-1900) were female sex over sixteen years of age, completion of eight years of elementary school, satisfactory performance on subject exams, affirmation by others of good physical, intellectual, and moral character, and a promise to teach school. Transformation of two-year "normal" schools to four-year colleges marked the beginning of the second stage (1901-1930). Requirements were "upgraded" to include a high school diploma. Fluctuations in the teaching force supply had predicated the third stage (1931-present) which was selective retentions.

An examination of literature during this latter stage revealed a cycle of emphasis and de-emphasis upon teacher education selection and retention practices. This cycle was directly related to the market demand for educators.

The period from the 1930's to the commencement of World War II was marked by an oversupply of educators.

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The economic depression during the 1930's may have been a contributing factor to this oversupply, as the number of educators rose by slightly over 20,000 during the decade 1930 to 1940, while correspondingly, the school age population (5-17 year olds) declined. Actual school enrollment for this decade declined much less and average daily attendance rose. The data revealed that more students were attending school due to the unavailability of employment. This increase necessitated additional teachers initially, but declining enrollment coupled with an increase of students pursuing higher educational aspirations in search of job security, such as teaching, resulted in an oversupply.

A. S. Barr and Lois Douglas's "The Pretraining Selection of Teachers" was one of the earliest attempts to focus on the need to differentiate between "legally qualified" teachers and "quality" teachers. Their solution rested "in the pretraining selection of teachers and the raising of standards of training." Barr reiterated this solution in a later article, "One of the best and surest means of improving the quality of teaching is to admit to


training only those individuals of superior potential teaching capacity."^{26}

It was difficult to identify the factors and instruments to be employed in pretraining selection and guidance of teachers. R. W. Steiner and H. I. Von Halden examined and summarized approximately one hundred and fifty published papers on pretraining selection. They concluded that authorities agreed on one issue; education was in need of better selective practices.^{27} The development of several tendencies were revealed in their examination of the literature. These tendencies were:

1. The requirement of rigorous admission standards for teacher-training institutions.
2. An increased use of objective techniques and statistical procedures in pretraining selection.
3. The need for continuity throughout the training program in the area of elimination or retention.
4. An extension of the training period.
5. The use of multiple criteria in pretraining selection.
6. A recognition of the value of cumulative records.


7. The use of rigid entrance requirements to raise the level and attitude toward the profession.

8. An agreement that teacher-training institutions were not receiving the best student material.\textsuperscript{28}

These trends, identified nearly a half century ago, were to prevail repeatedly in the literature during periods of decreased teacher demand and likewise, to dissipate during periods of increased teacher demand. Weaver indicated the following variables that might alter teacher demand: (1) change in school-age population; (2) change in enrollment; (3) change in student-teacher ratio; (4) further reduction of the dropout rate; (5) downward expansion into mass preprimary education; (6) expanded school year; and (7) expansion of supplementary education.\textsuperscript{29} The latter four variables were projected areas of future expansion which ultimately would increase enrollment and teacher demand. The first three variables directly affected teacher demand at a given time period. The post-World War II birthrate increased the school age population and enrollment, which in turn increased the student teacher ratio and teacher demand. Conversely a decrease in population and enrollment, as experienced in the 1970-1980 decade, has decreased teacher demand.\textsuperscript{30} Events of immense social impact, such as war,

\textsuperscript{28}Steiner and Von Halden, pp. 341-342.

\textsuperscript{29}Weaver, p. 4.

\textsuperscript{30}Weaver, p. 6.
technological change, or realignment of social emphasis, temporarily altered the student teacher ratio.

The consequences of declining student population and enrollment during the last decade not only created a surplus of educators, but resulted in limited job market access by raising the level of prerequisite education essential for employment. Professionalization extended to teacher preparatory institutions, for they were primarily responsible for identifying, educating, and recommending potential candidates.31

Complications arose due to the "open access" practices of many universities. Martin Haberman brought this problem to the forefront, as he observed that "the population ... taking advantage of open access to the total university will build up an increasing pressure on the schools of education."32 The problem was further intensified, Haberman believed, by the inevitability of graduation and certification upon admission to teacher education. His concern resulted in a survey of 464 N.C.A.T.E. teacher training institutions on their selection criteria. The criteria frequently employed by the responding 386 institutions were college grades, English proficiency, speech proficiency, academic references, and direct

31Weaver, p. 28.

experiences with children. More than 68 percent of the respondents did not contemplate a change in their selection system.

James Carpenter surveyed selection criteria at 180 AACTE institutions. His findings concurred with Haberman's that academic proficiency as measured by college grades was the most frequently employed criterion. Approximately 92.5 percent of the respondents required an overall grade-point average within the range of 2.0 to 2.5. Similar grade-point averages were required in the major area by 83 percent and in professional education courses by 72 percent of the respondents. Reapplication for admission was possible at 89 percent of the institutions, which led Carpenter to conclude that "teacher education continues to be the route of least resistance."\[33\]

Selection-retention policies in teacher education at 98 NCACSS/NCATE institutions were examined by Brubaker. He found minimal selectivity in which: (1) scholarly aptitude was the most frequently employed criterion; (2) "undesirables" were eliminated prior to formal admission applications; and (3) there were few admission denials.\[34\]


\[34\] Brubaker, pp. 28-30.
A nationwide survey of selection-retention practices by Shank indicated that during the ensuing six years since Haberman's study very little had changed in regard to teacher admission practices. The criterion frequently used in admission assessment was grade-point average. Of the 200 responding institutions, 96.8 percent utilized grade-point average, but 94.4 percent indicated it was used in combination with other criteria. Other criteria included language proficiency, C or better in Composition courses, and a proficiency test in Language. Standardized tests were required by approximately one-fourth of the institutions with the ACT being the standardized test most frequently used. Seven institutions were required by state mandate to admit only candidates with a specific score.\textsuperscript{35}

The literature reported revealed that teacher education selection and admission practice revision was not a phenomenon peculiar to the present decade, but appeared to coincide with an era of rapid technological and economic change and growth. The procedures employed in teacher education admission and selection have changed very little in the last half century. Essentially the procedures are dependent upon measurable cognitive factors,

such as grade-point averages and examinations. The emphasis upon selection and admission procedures appeared to be directly related to the rate of economic and technological growth.

Status of Competency Testing for Teacher Certification

By March 1980, 30 states were requiring students to demonstrate minimal levels of competencies, and to pass written tests to receive a high school diploma. This rapid growth of legislative minimum competency tests for students had signaled the public's interest in accountability for the educational profession. A 1979 Gallup Poll, which indicated 85 percent of the American public favored the concept of teacher competency tests, confirmed the public's interest.

Educators' reactions to this public mandate varied with the attending audience, but the general attitude was negative. AFT, with its nearly half a million members, opposed testing employed teachers, but supported certification tests. NEA, which represents a larger membership,


38 Craig Peterson, "The Teacher Competency Movement: Blessing or Sham," Part I, Learning, X (July/August, 1981), 27.
maintained the position that "examinations ... must not be used as a condition of employment, evaluation, criterion for certification, placement, or promotion of teachers."\textsuperscript{39}

Despite this vocal protest by members of the profession, fourteen states have mandated some form of competency testing for teachers and prospective teachers and several additional states are considering the requirement. A survey of superintendents and commissioners of education by E. F. Nothern suggested that a trend was developing.\textsuperscript{40}

Earlier studies conducted by Melvin Villeme in 1973 and 1976 indicated that competency certification was on the decline. During a three year period, Villeme found that the number of states implementing competency certification had increased by three and the number moving toward it had decreased by seventeen.\textsuperscript{41}

The appearance of a renewed interest in competency certification coincided with the implementation of minimum competency testing for students, according to a report made by Chris Pipho in May 1978.\textsuperscript{42} Literature on


\textsuperscript{40}E. F. Nothern, "The Trend Toward Competency Testing of Teachers," Phi Delta Kappan, LXI (January, 1980), 359.

\textsuperscript{41}G. Villeme, "The Decline of Competency-Based Teacher Certification," Phi Delta Kappan, LVIII (January, 1977), 428-49.

\textsuperscript{42}Pipho, p. 372.
competency-based education from this date on was actually referring to minimal competency testing and not competency-based teacher education. M. K. Piper and R. W. Houston differentiated between the two concepts. Although both CBTE and MCT emphasized exit requirements, their stress was upon different areas. "CBTE emphasizes professional practice in the classroom to improve learning. MCT for teachers emphasizes minimal cognitive knowledge," according to the authors.43

In 1977 Louisiana joined Mississippi, North Carolina, South Carolina, and West Virginia in requiring the NTE as a certification requirement. The Louisiana State Board of Education established cutoff scores ranging from 1,052 to 1,202 (out of a possible 1,980) depending on the applicants' subject area. Their decision overruled a recommendation by the Louisiana Association of Educators that the initial cutoff score be 900 and phase upward to 1,050 in three years. The resulting failure rate of the first test administration was so great that the legislature passed a two-year law permitting candidates within 10 percent of cutoff to teach while preparing for a retake of the test.44

Florida chose a different avenue when legislation requiring a test of teaching competency and subject matter


44Peterson, Part I, p. 28.
for initial certification was passed in June 1978. Under the auspices of the State Board of Education, the body responsible for developing a test instrument, the Florida Council on Teacher Education (COTE) identified twenty-three essential teacher competencies. Effective July 1, 1980, applicants for initial Florida teaching certification must demonstrate on a comprehensive written examination, mastery of these competencies.45

Georgia, like Florida, had initiated a sophisticated program of performance-based certification. The Georgia program, which had been in the process of development since 1973, instituted a criterion-referenced test as a requirement for teacher certification. The twenty-four tests, developed by the National Evaluation Systems of Amherst, Massachusetts, covered 45 certification areas. The testing program afforded greater flexibility than standardized tests in ways such as the following: the absence of time pressures, an available list of performance objectives for each test, and a report in terms of the performance objectives on the test.46

Applicants who passed the test, which included 80 percent of those who took it the first year, received a


nonrenewable professional certificate valid for three years. Nonrenewable certificates required beginning teachers to demonstrate competence in the classroom before obtaining a five year renewable certificate. Assessment of the 14 basic teacher competencies is conducted by a three member team, which includes a local district administrator, a local master teacher, and an external data collector from one of the 17 regional assessment centers. Assessments are at least 60 days apart and the time of day is at the teacher's discretion. Two assessments per year are required for provisional teachers.47

An independent review of the teacher certification test by experts found several weaknesses with the test and suggested a thorough three-year study of the validity, reliability, and objectivity of the test.48

The NTE has been used in North Carolina since 1964 as the criteria for the acquisition of teaching certificates. A "Quality Assurance Program for Professional Personnel" was adopted in 1979. This statewide teacher evaluation program, which was piloted in 24 school systems during the summer of 1982, used teachers' NTE scores and student achievement test scores to validate a new evaluation instrument.49 An earlier study conducted by

the North Carolina Department of Education found that of 57 variables which conditioned student achievement in statewide standardized tests, teacher quality as measured by the NTE was the single most important predictor. The authors were amazed to find that a 1 percent increase in teacher quality, as measured by standardized test scores, resulted in a 5 percent decline in the rate of failure on high school competency tests. Findings of this nature were apparently the basis for selecting NTE scores and student achievement test scores for the 1982 validity study. In 1979, bills incorporating competency testing for teacher certification were introduced in several states. Arkansas's House Bill 475 was passed overwhelmingly in record time. The bill directed the State Board of Education to issue rules and regulations for teacher certification that would include the competency testing concept as a condition of certification. The State Board of Education adopted the NTE as the required testing instrument.

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51 Peterson, Part I, p. 29.

Virginia amended teacher certification policy in 1979 also by the passage of House Bill 1723. The resulting law required every teacher seeking initial certification to take a professional examination prescribed by the board. The NTE was the selected examination.53

State Boards of Education have mandated testing in Tennessee and Alabama. Effective January 1, 1981, all applicants for initial teacher certification in Tennessee were required to take the NTE—commons examination.54 Following a two year period of usage, the State Department of Education will decide whether to continue use of the NTE and if so what minimum scores will be required.55

National Evaluation Systems was contracted by the Alabama State Board of Education to develop an examination for prospective teachers. The development of this instrument was in compliance with a resolution passed January, 1980.

Critics of competency testing for teacher certification argued that this trend is unique to the southeastern states; but further examination of the subject revealed this was not true. In 1980, Arizona, Oklahoma, Texas, and Iowa amended their certification standards to include some form of competency testing for initial certification. New

53Vlaanderen, p. 31. 54Vlaanderen, p. 15.
55Memorandum from Bert C. Bach, State University and Community College System of Tennessee, January 5, 1982.
Mexico joined the other southwestern states in 1981 and South Dakota and Colorado were giving the issue serious consideration.\textsuperscript{56}

The Arizona Teacher Professional Examination was the direct result of House Bill 2013 passed in June, 1980.\textsuperscript{57} The test, which had been recently field tested, was administered to six Arizona legislators. Half of the legislators failed to meet the minimum requirement of 75 percent correct and this included the chief supporter for a proficiency test. Approximately two-thirds of the 3,921 persons used in the field test secured 75 percent correct.\textsuperscript{58}

On October 11, 1980, the Texas State Board of Education approved a plan for competency testing of prospective teachers. The plan requires a literacy test for admission to teacher education and subject matter tests before certification. The program was scheduled to begin September 1, 1981.\textsuperscript{59} The Texas State Teachers Association was able to insert the concept that no single test be used to determine certification.\textsuperscript{60}

Oklahoma's H. B. 1706 was signed into law on June 10, 1980. Unlike other efforts that focused specifically on competency examinations or other single focus reforms, the Oklahoma effort was designed to encourage vast changes in certification. Provisions were made for: (1) raising college admission standards; (2) requiring competency examinations for graduation; (3) mandating an entry-year internship before certification; (4) monitoring the beginning teacher's performance; and (5) providing for the continuation of education for teachers and teacher educators. The bill takes effect for all students graduating after 31 January 1982.61

The New Mexico state board of education adopted a plan in November 1981 that requires "teacher and administrator candidates to pass a test of 'general education, communication skills, methods and practices, and content specialization' before they can be licensed to teach."62 The test will be developed by the state and go into effect in July 1983.

South Carolina, which has used the NTE as a certification requirement since 1945,63 passed in 1979


Act 187, The Educator Improvement Act. The Act, to take effect in 1981-82, was designed to upgrade standards for educators, insure that prospective teachers have basic skills, improve educator training programs, insure that prospective teachers know their area specialization, and develop evaluation instruments and standards by which classroom teachers can be assessed. Accomplishment of these goals was to be achieved by a comprehensive screening and testing system from the prospective teacher's freshman or sophomore year to continuing contract status.64

Public concerns about fiscal responsibility and academic literacy have prompted many state legislatures to intervene in educational policy. Legislators are either passing laws establishing standards, prescribing programs, and designating regulations, or directing state departments of education to do so in order to remedy voter concern over the quality of education. The legislative action taken during the past five years may or may not be indicative of a trend, but it clearly demonstrates the high interest nationwide in changing certification requirements to insure the selection of competent teachers for America's youth.

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Literature Related to the National Teacher Examination

From inception to its first administration in 1940, the primary purpose of the National Teacher Examination has been to measure the teacher's "facts, knowledge and skills and to some extent ... the ability to use such facts, knowledge and skills functionally." 65

Confronted by a combination of economic conditions, decreasing enrollment, and an oversupply of teachers, a group of school superintendents appealed to the American Council on Education for assistance in improving their own teacher selection procedures. Through a subvention from the Carnegie Foundation, the National Committee on Teacher Examinations was appointed and the project was launched. Committee membership included: A. J. Stoddard, Ben Graham, Sidney Hall, J. L. Hanley, E. W. Jacobsen, C. R. Reed, M. E. Townsend, and H. E. Hawkes. 66

The Cooperative Test Service, an agency of the American Council on Education, was engaged to prepare and validate the tests under the supervision of Dr. Ben Wood and Dr. John Flanagan. The American Council on Education assumed full responsibility for preparing, administering,

65 A. J. Stoddard, "The Selection of Teachers from the National Viewpoint," Educational Record, XXI (January, 1940), 150.

and scoring the examinations until 1950, when this responsibility was transferred to the Educational Testing Service (ETS) in Princeton, New Jersey.\(^67\)

The National Teacher Examinations (NTE) provide objective measures of academic achievement for college seniors completing teacher education programs and advanced candidates in specific educational fields. The tests consist of a Common Examination and 25 Area Examinations.\(^68\)

The Common Examinations of the NTE provide scores in Professional Education, General Education, and a weighted combination of these two areas. T. N. Quirk, B. J. Witten, and S. Weinberg caution researchers on the applicability of the Professional Education scores, General Education scores, and any of their subtest scores in research studies since they have not "been equated to each other from form to form."\(^69\)

The Weighted Common Examinations Total (WCET) score is on a scale based on the scores earned by college seniors who took the Common Examinations in 1940. The test is


equated statistically to previous forms of this test. The WCET scores are, therefore, statistically comparable from form to form and their use would be deemed proper in research studies.70

The Teaching Area Examinations (TAE) scaled score is based on all candidates who indicated on the February 1964 administration of the TAE that the TAE they took was in the field they were best prepared to teach. Each new form has been equated to earlier forms of the TAE since 1964. The twenty-five area test scores cannot be compared with each other. Only scores for candidates taking the same Area Examination, if taken since 1964, can be compared.

Concurrent validity of the NTE has been determined through the use of correlation studies. The variables correlated with the NTE have included test scores, undergraduate academic success, and personal characteristics. Research pertinent to this study was reported.

J. McCamey correlated the 1957 NTE scores of the 1957 graduates at the University of Hawaii Teachers College (N = 211) with selected academic records. A correlation of .63 was reported between the Professional Information subtest of the Common Examination and the Elementary School TAE. Correlations between GPA in education courses and the Professional Information subtest were moderate with the

70Quirk, Witten, and Weinberg, p. 90.
various levels obtaining these correlations: preschool primary .30, secondary .28, and elementary .23.\textsuperscript{71}

J. Duncan correlated WCET scores with quality-point averages (QPA) of 62 students who took the NTE during the period July 1968 to July 1970 at East Tennessee State University and had completed four basic psychology courses, four education courses, and had graduated from the university. The WCET correlated .62 with Psychology QPA, .58 with Education QPA, .55 with major area QPA, and .62 with total QPA.\textsuperscript{72}

Using 31,000 candidates at 18 institutions, W. Wexler established indices for the concurrent validity of the NTE scores as related to self-reported grade-point averages. The overall correlation between WCET and grade-point average was .37. Correlation of the institution's mean on the WCET with five grade-point average levels was .70. He concluded that the WCET and most of the area exams had at least moderate concurrent validity.\textsuperscript{73}


\textsuperscript{72}J. Duncan, "A Statistical Analysis of Student Grades in Teacher Education Curricula and Certain Scores on the National Teacher Examinations" (Master's thesis, East Tennessee State University, 1971), pp. 29-33.

\textsuperscript{73}W. Wexler, Concurrent Validity of the National Teacher Examinations, Arlington, Va., Educational Resources Information Center, ERIC Document ED 110 447, 1975.
E. L. Frickey examined the relationship between success in student teaching, socioeconomic factors, and the results on the NTE. Two areas were found to be statistically significant in their relationships with NTE scores. These areas were high school grade-point average and grade-point average in professional education courses.74

P. B. Mercer studied the relationships between scores on the NTE and four variables: professional education grade-point average, overall grade-point average, evaluation of student teaching performance by supervising teachers, and evaluation of student teaching performance by university supervisors. The .05 level of confidence determined significant relationships between scores on the NTE and each of the variables. Pearson product-moment correlation coefficients of .5843 for Professional Education grade-point averages and .6937 for overall grade-point averages verified significant relationships with the NTE-WCET.75

Scores on the NTE subtest in professional education for 55 secondary education majors were correlated with

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75P. B. Mercer, "A Study of the Relationship Between Scores on the National Teacher Examinations, Teaching Performance, and Other Variables in a Selected Group of Secondary Student Teachers" (Doctoral dissertation, East Texas State University, 1972), pp. 102-104.
grades in courses of educational psychology, secondary methods, and tests and measurement by Ray Merritt. His findings revealed that all three courses were positively and significantly related to the NTE professional education subtest. Educational psychology showed the strongest relationship with a coefficient of .54 at the .001 level of confidence. Division of the group by sex reduced the correlation coefficients. Grade in educational psychology for females was the only variable that related significantly to NTE performance.\(^6\)

A careful review of existing research on the concurrent validity of the National Teacher Examination (NTE) seems to support the hypothesis that a moderate to low positive correlation exists between overall grade-point average, grade-point averages in professional education courses, and achievement on the NTE.

**Studies Related to Predicting National Teacher Examination Scores**

The National Teacher Examination is currently used in 30 states for teacher certification and hiring. Universities also employ the instrument to assess the achievement of students in their colleges of education.

ETS director of teacher programs and services

William Harris estimated that more than 75,000 prospective teachers annually take the NTE. As the number of states which require students to pass the NTE for initial certification is increasing, proportionately, the number of studies related to prediction of National Teacher Examination scores is increasing.

In 1967 H. J. Walberg hypothesized that scholastic aptitude and achievement would predict scores on the NTE. His hypothesis was confirmed by study results which indicated the NTE-WCET score was moderately correlated with scholastic aptitude and achievement. The correlations, which were significant beyond the .001 level of confidence, were .389 with scholastic aptitude, .396 with first term college grade-point average, and .356 with cumulative seventh semester grade-point average. The correlation between NTE and high school grade-point average was in the predicted direction but low and nonsignificant.

Walberg suggested, on the basis of his findings, that if scores on the NTE were used as one criterion of teaching ability, it would be possible to base admission policies on scholastic aptitude tests or high school grades. The

77"ETS Announces Plans to Revise the National Teacher Examination," Phi Delta Kappan, LXIII (October, 1981), 83.

correlation with first term grades also raised the possibility of employing first term grades to screen or counsel potential teacher candidates.\(^79\)

A similar study conducted by J. B. Ayers and M. E. Rohr at Tennessee Technological University examined a combination of variables in predicting academic success in a teacher preparation program with overall grade-point averages and scores on the NTE. Results of this study indicated the most valid predictors of success in teacher preparation programs as measured by overall grade-point average and the NTE were social science and major teaching field grade-point averages. Subjects who had been more successful in lower division work tended to complete the teacher preparation program more successfully as measured by overall grade-point averages and NTE scores.\(^80\)

In a later longitudinal study at the same university, J. B. Ayers and G. S. Qualls correlated NTE test scores with scores on the American College Test and undergraduate grade-point averages. Correlations between grade-point averages and the WCET and TAE were significant at or beyond the .05 level of confidence. The correlations between the WCET and overall grade-point averages were .48 at the

\(^79\)Walberg, p. 130.

elementary level and .44 at the secondary level. These were noticeably lower than the average .56 reported by Quirk, Witten, and Weinberg. Correlations between the ACT scores and the WCET and TAE were significant at or beyond the .05 level of confidence. The ACT composite score was the best predictor of the five ACT scores. The ACT composite also appeared to be a better predictor than undergraduate grade-point averages. Correlations at the elementary level were .74 and .70 at the secondary level. The authors suggested that the study results might be beneficial to those administrators responsible for counseling and admitting students to teacher education programs.

Linda Pratt examined Scholastic Aptitude Test (SAT) scores and undergraduate grade-point averages of 166 education majors at North Carolina Central University. SAT Verbal scores, SAT Mathematics scores, and overall grade-point average were found to be significant predictors of the NTE-WCET. The respective coefficients were .597, .415, and .445. The author indicated that SAT

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81 Quirk, Witten, and Weinberg, p. 110.

scores were acceptable predictors of the NTE Common Examination.  

One of the major purposes of J. R. Tollett's study was to determine the relationship between selected personal, high school, scholastic and interaction variables, and selected scores on the National Teacher Examination. Data were collected for 111 students. Pearson product-moment correlations, partial correlations, and stepwise multiple regression were the statistics applied to the data. The results of the study found the following three predictor variables to be significant at the .05 level with the NTE composite: ACT composite score, freshman grade-point average, and number of children in the parental family.  

In a study conducted during 1980, M. R. Boclair focused on the relationships between ACT test scores, sophomore grade-point average, vocabulary, and reading comprehension scores as measured by the Nelson-Denny Reading test, sex, and NTE composite scores.

The following conclusions were reached in regard to the data analyzed:

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1. A significant relationship existed between the NTE and vocabulary and reading comprehension at the .01 level.

2. A significant relationship existed among grade-point average, ACT, and NTE at the .01 level.

3. No significant differences existed in academic major and the NTE.

4. No significant differences existed between sex groups and the NTE.

5. A significant correlation existed among the combination of the predictor variables of vocabulary and reading comprehension, ACT score, sophomore grade-point average, and NTE composite score. No significant correlation existed among the combination of the predictor variables of sex, academic major, and NTE composite score.\(^85\)

The combination of reading vocabulary, reading comprehension, ACT scores, and sophomore grade-point average yielded a multiple R of .73\(^86\) which indicates this combination accounts for 53 percent of the variance in the NTE composite score.\(^87\)

\(^85\)M. R. Boclar, "Relationship of ACT Scores, Sophomore Grade-Point Averages, Vocabulary and Reading Comprehension, Major and Sex to Preservice Teacher's Performance on the National Teacher Examinations from July 1978 to February 1980" (Doctoral dissertation, Mississippi State University, 1980), pp. 60-61.

\(^86\)Boclar, p. 56.

\(^87\)The common variance shared with the NTE was found by squaring the multiple R.
Background of Tests Utilized in Study

National Teacher Examination-Common Examination

The National Teacher Examination is offered by the Educational Testing Service as a means of obtaining measures of academic preparation in the areas of general education, professional education, and subject-field specialization. ETS proposes the use of the test by colleges to review instructional programs, admission and retention policies, and grading methods.

The secure examinations are offered at more than 400 testing centers throughout the country on one or more of the three specified testing dates. The testing session is composed of two distinct testing periods, one for the Common Examination and one for the area examinations.

The Common Examination session is 195 minutes in length and consists of a 110-item test on Professional Education (90 minutes), a 45-item test of Written English Expression (30 minutes), a 65-item test of Social Studies, Literature, and the Fine Arts (40 minutes), and a 50-item test of Science and Mathematics (35 minutes). The four principal tests of the Common Examinations have Kuder-Richardson (K-R) 20 reliabilities ranging from .87 (Science and

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Mathematics) to .91 (Professional Education). These are adequate, according to Mitchell, but not inspiring.  

The institution receives a report of scaled scores. Two-digit scores are reported for each of the four Common Examinations. These subscores are weighted by the following numerical values: 4.0--Professional Education; 1.0 Written English Expressions; 2.5--Social Studies, Literature, and the Fine Arts; 2.5--Science and Mathematics. The four weighted subscores are combined into the Weighted Common Examination Total (WCET) score. The reliability of the WCET was .96. The reliability of the General Education Test (the four principal tests minus Professional Education) was .95.

The WCET is reported on a scale of 250 to 990. The standard errors of measurement for the three digit score are approximately 20 to 30 points. If a person were tested an infinite number of times, about two out of every three scores would fall within the range from one standard error of measurement below the "true" score to one standard error of measurement above the "true" score.

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89 Mitchell, p. 517.


Scholastic Aptitude Test of the College Entrance Examination Board

The College Entrance Examination Board (CEEB) was formed in an effort by colleges and testing specialists "to devise instruments for assessing the academic preparation and promise of college applicants." The operational phases of the CEEB are administered by the Educational Testing Service (ETS). The institutional members guide policy, are actively involved in serving on test committees that oversee test development, and participate in test construction. Three college entrance examinations developed by the CEEB are The Preliminary Scholastic Aptitude Test (PSAT); The Scholastic Aptitude Test (SAT); and a series of Achievement Tests.

The College Board tests are administered in two sessions--the Scholastic Aptitude Test in the morning and achievement testing in the afternoon. The SAT is a three hour objective test. The test is offered five times during the year at testing centers throughout the country.

The SAT measures the essential language and mathematical concepts students would encounter in college. The Verbal test contains items which incorporate antonym, analogy, and reading comprehension. The mathematical test

items cover arithmetic, algebra, geometry, and word problems. Separate verbal and mathematical scores are reported. The scores for each test range from 200 to 800.\(^9^3\)

The correlations between SAT-Verbal and SAT-Mathematical tests have ranged from a low of .38 to a high of .77. The current forms have had a median inter-correlation of .64.\(^9^4\) The K-R 20 reliability for the SAT tests administered between 1959 and 1962 ranged from a low of .88 to a high of .91 for Verbal and from a low of .87 to a high of .91 for Mathematical. The standard errors of measurement ranged from 30 to 34 scaled score points for SAT-V and from 31 to 37 points for SAT-M.\(^9^5\)

**American College Testing Assessment**

The ACT Assessment was introduced in 1959 by the American College Testing Program, an independent, non-profit organization. The initial format of the ACT academic examination was a "repackaged version of the already widely used Iowa Tests of Educational Development."\(^9^6\) Essentially, the test has remained the same with only minimal changes. The test is offered five times a year.

\(^9^3\)Whitla, *Yearbook*, p. 990.

\(^9^4\)Whitla, p. 993. \(^9^5\)Whitla, p. 995.

times a year, but only three new forms are created each year.

The Assessment Program includes the following: the Academic Tests; the ACT Interest Inventory, and the ACT Student Profile Section. The latter two sections are filled out by students as they register for the academic tests. The Academic Tests consist of four cognitive tests in the areas of English usage, Mathematics usage, Social Studies Reading, and Natural Sciences Reading. The testing requires 160 minutes and yields five scores, one for each cognitive area listed and a composite score.

The estimated reliability for the composite score is about .90. Internal-consistency reliabilities of the four separate parts is about .90. J. R. Hills indicates "overlap among the four tests." This is confirmed by the inter-correlations, being approximately .55 to .75, with the highest correlation between social studies reading and natural sciences reading.97

California Achievement Tests

The California Achievement Test is a battery of tests "designed for measuring, evaluating, and analyzing school achievement in terms of student performance in the basic

97Hills, Yearbook, p. 623.
curricular content areas of reading, mathematics, and language.\textsuperscript{98}

The scores obtained on the CAT are as follows:
Reading Vocabulary; Reading Comprehension; Total Reading, Spelling; Language Mechanics; Language Expression; Total Language; Mathematics Computation; Mathematics Concepts and Application; Total Math; Total Battery; and Reference Skills. For the purpose of this study only, Reading Comprehension, Mathematics Computation, Language Mechanics, and Language Expression tests raw scores were used. These four tests have been specified by the Tennessee State Board of Education as a requirement for admission to Teacher Education. The following requirements were specified as prerequisite to teacher education admission:

1. The test to be used will be the California Achievement Test (CAT), Level 19 (Form C or D) 1977 edition.

2. Only the following tests of the complete battery will be used:
   Mathematics: Use test 6 on Mathematics Computation
   Reading: Use test 2 on Reading Comprehension
   Language: Use test 4 on Language Mechanics and test 5 on Language Expression

3. The cut-off scores for all subject areas to be used for all elementary and secondary teachers are listed below:
   Mathematics: Raw score of 21 on Mathematics Computation
   Reading: Raw score of 22 on Reading Comprehension
   Language: Raw score of 38, Language Mechanics and Expression (combined)

\textsuperscript{98}Miriam M. Bryan, in Burros, The Eighth Mental Measurements Yearbook, p. 35.
In addition to the above scores, secondary English teachers must attain a raw score (combined) of 45 in Language. Secondary mathematics teachers must attain a raw score of 26 on mathematics computation.

On November 9, 1979, the State Board of Education approved the following changes regarding the testing of candidates. The following cut-off scores were established beginning in the Fall quarter or semester of the subsequent years:

<table>
<thead>
<tr>
<th></th>
<th>1980</th>
<th>1981</th>
<th>1982</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics: Test 6 on Mathematics</td>
<td>24</td>
<td>27</td>
<td>30</td>
</tr>
<tr>
<td>Reading: Test 2 on Reading Comprehension</td>
<td>25</td>
<td>27</td>
<td>30</td>
</tr>
<tr>
<td>Language: (combined scores) Test 4 on Language Mechanisms and test 5 on Language Expression</td>
<td>41</td>
<td>44</td>
<td>47</td>
</tr>
</tbody>
</table>

The presentation of scores of 17 on the ACT, or 765 on the SAT would be accepted in lieu of the California Achievement Test.

Retesting for Applicants Taking the California Achievement Tests

1. If an applicant for candidacy fails to pass any required area of the California Achievement Test battery, the test for that area may be retaken after remediation for at least one quarter or semester following the initial testing.

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100 Memorandum from Edward A. Cox, Chairman, Tennessee State Board of Education, January 17, 1980.
2. If an applicant fails any part of the required test battery on the second testing then at least one academic year must be spent in remediation before retesting is permitted. Candidates retaking any portion of the test must attain cut-off scores in effect at the time retesting occurs.

3. Candidates failing to meet the standards after three attempts shall not be admitted to candidacy. However, after a period of at least three years, a student may again start the series.  

Statistical data related to validity include inter-correlation coefficients. The median of the within-grade correlations between reading and mathematics is .75; between reading and language .89; and between mathematics and language .75. The alternate-form coefficients for the total battery range from .86 to .96 with median .93. The range for the reading, mathematics, and language tests extends from .80 to .91, with a median reliability of .87 for language and reading, and .855 for mathematics. For the subtests, the median reliabilities are lower: vocabulary .84; comprehension .79; computation .81; concepts .82; mechanics .84; usage .68; and spelling .78. 

101 Memorandum from Edward A. Cox.

102 Bryan, Yearbook, p. 36.
Chapter 3

METHODS AND PROCEDURES

Introduction

The research procedures were categorized into five areas: (1) research design; (2) population; (3) instrumentation; (4) collection of data; and (5) analysis of data.

Research Design

The design of this study was correlational, which involved the collection of scores on two or more variables on the same group of subjects and computing a correlation coefficient. R. A. Roth supported the use of the correlational design for the evaluation of selection criteria in teacher preparatory programs. As he further indicated, correlation studies "... will assist in determining whether or not criteria are indeed meaningful, and provide data to support the predictive validity of each criterion...."  


2Roth, p. 81.

62
The correlational method offered several advantages, but the primary ones are that it permits the measurement of a great number of variables and their interrelationships simultaneously and provides information concerning the degree of relationship between the variables being studied.

The correlational method is used for two major purposes, according to W. R. Borg and M. D. Gall. These are the exploration of relationships between variables and the prediction of scores on a variable from subjects' scores on other variables. Prediction studies are similar to relationship studies due to their involvement in computing correlations between a criterion and variables related to the criterion. The basic difference is the time when the variables are measured in relation to the criterion behavior. The variables in prediction studies are measured before the criterion behavior occurs and in relationship studies the criterion behavior and other variables are not measured in a specific order; frequently they are measured at the same point in time.

**Population**

The subjects of this study were 99 graduating seniors at East Tennessee State University who applied for initial

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4Borg and Gall, pp. 484-486.
teaching certification in Tennessee during the 1981 calendar year. Selection of these subjects was based upon the requirements of having taken the ACT or SAT test, the Common Examination of the National Teacher Examination during the 1981 calendar year, and recorded scores for the mathematics, reading, and English sections of the California Achievement Test.

Instrumentation

The standardized scores for all subjects selected for this study were: (1) The National Teacher Examination-Weighted Common Examination Total (NTE-WCET); (2) Mathematics, test 6, Reading, test 2, and Language, tests 4 and 5, subtests on the California Achievement Test, Level C-Form 19; (3) American College Test Composite; and (4) combined score of the Mathematical Aptitude Test and Verbal Aptitude Test on the Scholastic Aptitude Test of the College Entrance Examination Board.

Collection of Data

The following procedures were utilized in collecting the data pertinent to the study:

1. A list of graduating Seniors at East Tennessee State University who had applied for initial teaching certification in Tennessee during the 1981 calendar year was compiled from information supplied by the College of
Education. Each student was arbitrarily assigned a number for the purpose of anonymity.

2. The data sources for the test scores and grade-point averages, to be used as variables in the study, were identified. These variables are shown in Table 1, page 66. The data sources were the records maintained by the College of Education and the Office of Admissions and Records at East Tennessee State University.

3. A summary chart was developed to record the information collected.

4. Scores for the ACT composite, SAT combined, CAT reading, math, English subtests, and professional education sequences were taken from the official record of the students as they were reported by the various agencies. These scores and grade-point averages were obtained from the Office of Admissions and Records.

5. Scores for the National Teacher Examination were taken from the official record of the student test results exactly as they were reported by the Educational Testing Service. These scores were obtained from the College of Education.

6. The grade-point averages for the Professional Education sequence were determined by obtaining the letter grades recorded on the students' official records for the identified courses. A weighted value of 4.00 was assigned for each A, 3.00 for each B, 2.00 for each C, 1.00 for each
Table 1
Data Collected for Each Senior Applicant for Initial Teacher Certification from East Tennessee State University During 1981

<table>
<thead>
<tr>
<th>Variable Identification</th>
<th>Name of Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>X₁</td>
<td>Sex</td>
</tr>
<tr>
<td>X₂</td>
<td>Level</td>
</tr>
<tr>
<td>X₃</td>
<td>ACT composite score</td>
</tr>
<tr>
<td>X₄</td>
<td>Teacher Education Admission grade-point average</td>
</tr>
<tr>
<td>X₅</td>
<td>CAT Reading score</td>
</tr>
<tr>
<td>X₆</td>
<td>CAT Math score</td>
</tr>
<tr>
<td>X₇</td>
<td>CAT Language</td>
</tr>
<tr>
<td>X₈</td>
<td>Professional Education sequence grade-point average</td>
</tr>
<tr>
<td>Y</td>
<td>Criterion</td>
</tr>
</tbody>
</table>

Weighted Common Examination Total Score of the National Teacher Examination
D, 0.00 for each F. These weighted values were multiplied by the credit hours designated to each course. The values were totalled and divided by the total number of course credit hours attempted. Conversions were made for courses taken under the quarter system by multiplying the course credit hours by two-thirds.

7. Grade-point averages upon admission to teacher education were taken from the official student transcript. The overall grade-point average the semester or quarter preceding student teaching was the basis for teacher education admission grade-point average.

8. SAT total scores were converted to equivalent ACT composite scores by a table provided by American College Testing. This table is used by the East Tennessee State University Office of Admissions and Records for score conversion.

Analysis of Data

The analysis of data in this study involves the correlation of each predictor variable with the criterion NTE-WCET. For the purposes of this study the Pearson product-moment and the point-biserial correlation were employed. The Pearson product-moment was selected over other techniques, because the variables to be correlated

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5Letter received from American College Testing by Office of Admissions, December, 1980.
were expressed on an interval scale and this correlation was subject to a smaller standard error. The Pearson product-moment was used to test hypotheses three, four, five, six, seven, and eight. The following formula was used in computing the Pearson product-moment correlation coefficient (r).\textsuperscript{6}

\[
  r = \frac{N\bar{X}\bar{Y} - \bar{X}\bar{Y}}{\sqrt{\left(\frac{N\bar{X}^2 - (\bar{X})^2}{N\bar{Y}^2 - (\bar{Y})^2} \right)^2}}
\]

The point-biserial correlation is a special case of the Pearson product-moment used when one variable is measured on an interval scale and the other variable is a discrete dichotomy. Point-biserial correlation was used to test hypotheses one and two. The following formula was used in computing the point-biserial correlation coefficient (rpb).\textsuperscript{7}

\[
  r_{pb} = \frac{\bar{Y}_1 - \bar{Y}_2}{s_y} \sqrt{p \cdot q}
\]

The multiple regression model was employed to determine what combination of variables could predict the criterion better than any one variable. The procedure begins with identifying the single variable that seems to account for a larger portion of the variance in the


\textsuperscript{7}Hinkle, Wiersma, and Jurs, p. 97.
criterion than any other variable. This variable is retained. The variable selected next is the one that accounts for a larger portion of the remaining variance in the criterion than any remaining variables. Borg and Gall indicated that "better gains are usually obtained with multiple regression when individual predictors correlate .35 or greater with the criterion and when these predictors are not highly correlated with one another." The procedure continued until the addition of another predictor no longer significantly increased the multiple correlation (R). This is determined when the inclusion of an additional predictor does not account for a significant proportion of the variance. The resulting regression followed the form:

\[ y' = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5 + b_6 x_6 + b_7 x_7 + b_8 x_8 \]

where

- \( y' \) = the predicted criterion score
- \( a \) = the intercept
- \( b_k \) = the regression coefficient for the predictor variables
- \( x_k \) = the predictor variable

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8Borg and Gall, p. 499.
9Hinkle, Wiersma, and Jurs, pp. 404-405.
The following formula was used to test the significance of variables added to the regression equation.\textsuperscript{11}

\[
F = \frac{R^2_{y.12} - R^2_{y.1}}{(K_1 - K_2)} \frac{1}{(1 - R^2_{y.12})/(N - K_1 - 1)}
\]

The .05 level of significance was considered significant in all analyses. After collection of data, the scores and grade-point averages were coded, key punched, and computed at the East Tennessee State University Data Processing Center. The Statistical Analysis System (SAS) was employed in the computation.

\textsuperscript{11}Kerlinger and Pedhazur, p. 70.
Chapter 4
ANALYSIS OF DATA

Introduction

The problem of this study was to determine the relationships among selected predictor variables in order to identify the combination of variables which best predict scores on the National Teacher Examination-Weighted Common Examination Total Score. This chapter will report the statistical analyses used in this study. The analyses of data are presented in tabular and narrative form.

The results of the analyses of data will be reported in two sections. The first section concerns the correlation of selected predictor variables with the NTE-WCET scores. Analyses of hypotheses one, two, three, four, five, six, seven, and eight will be reported in this section. The second section concerns the combination of predictor variables related to the NTE-WCET scores. Analysis of hypothesis nine will be reported in this section.

Correlation of Selected Predictor Variables with NTE-WCET Scores

Sex, level, ACT composite score, teacher education admission grade-point averages, CAT Reading scores, CAT Math scores, CAT English scores, and Professional Education
sequence grade-point averages were entered as independent predictors of NTE-WCET scores. In response to the first eight hypotheses, a correlation coefficient analysis was performed using computer program SAS-Procedure Correlation (PROC-CORR).

The single correlation coefficients of the variable to NTE-WCET that were obtained from the SAS-PROCEDURE CORRELATION program are shown in Table 2, page 73.

\(H_1:\) There will be a significant correlation between sex and the NTE-WCET scores.

Hypothesis one predicted a significant correlation between the sex of the candidate and the NTE-WCET scores. The correlation coefficient was \(-0.06995\), which was not statistically significant at the .05 level. Sex and the NTE-WCET scores share a common variance of .4893 percent, which is less than one percent.

Decision: Based on the findings hypothesis one was rejected.

\(H_2:\) There will be a significant correlation between teaching level and the NTE-WCET scores.

Hypothesis two predicted a significant correlation between the teaching level of the candidate and the NTE-WCET scores. The correlation coefficient was \(0.01040\), which was not statistically significant at the .05 level. Teaching level and the NTE-WCET scores share a common variance of .01 percent, which is less than one percent.
Table 2
Correlation of Selected Predictor Variables with NTE-WCET Scores

<table>
<thead>
<tr>
<th>Predictor Variables</th>
<th>$r$</th>
<th>$r^2$</th>
<th>$p &gt; r$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X_1$ (Sex)</td>
<td>-.06995</td>
<td>.0048</td>
<td>.4914</td>
</tr>
<tr>
<td>$X_2$ (Level)</td>
<td>.01040</td>
<td>.0001</td>
<td>.9186</td>
</tr>
<tr>
<td>$X_3$ (ACT Composite)</td>
<td>.86157</td>
<td>.7423</td>
<td>.0001</td>
</tr>
<tr>
<td>$X_4$ (Teacher Education Admission GPA)</td>
<td>.66454</td>
<td>.4416</td>
<td>.0001</td>
</tr>
<tr>
<td>$X_5$ (CAT Reading)</td>
<td>.78664</td>
<td>.6188</td>
<td>.0001</td>
</tr>
<tr>
<td>$X_6$ (CAT Math)</td>
<td>.43117</td>
<td>.1859</td>
<td>.0001</td>
</tr>
<tr>
<td>$X_7$ (CAT English)</td>
<td>.62343</td>
<td>.3886</td>
<td>.0001</td>
</tr>
<tr>
<td>$X_8$ (Professional Education Sequence GPA)</td>
<td>.59491</td>
<td>.3539</td>
<td>.0001</td>
</tr>
</tbody>
</table>
Decision: Based on the findings hypothesis two was rejected.

H3: There will be a significant correlation between the ACT composite scores and the NTE-WCET scores.

Hypothesis three predicted a significant correlation between the ACT composite scores and the NTE-WCET scores. The resulting correlation coefficient was .86157 which was statistically significant at the .001 level. The ACT composite scores and the NTE-WCET scores share a common variance of 74.23 percent.

Decision: Based on the findings hypothesis three was accepted.

H4: There will be a significant correlation between the teacher education admission grade-point average and the NTE-WCET scores.

Hypothesis four predicted a significant correlation between the teacher education admission grade-point average and the NTE-WCET scores. A correlation coefficient of .66454 was obtained, which was statistically significant at the .0001 level. The teacher education admission grade-point average and the NTE-WCET scores share a common variance of 44.16 percent.

Decision: Based on the findings hypothesis four was accepted.

H5: There will be a significant correlation between the CAT-Reading scores and the NTE-WCET scores.
Hypothesis five predicted a significant correlation between CAT-Reading scores and the NTE-WCET scores. The resulting correlation coefficient was .78664, which was statistically significant at the .0001 level. CAT Reading scores and NTE-WCET scores share a common variance of 61.88 percent.

Decision: Based on the findings hypothesis five was accepted.

H₆: There will be a significant correlation between the CAT Math scores and the NTE-WCET scores.

Hypothesis six predicted a significant correlation between CAT Math scores and the NTE-WCET scores. The resulting correlation coefficient was .43117, which was statistically significant at the .0001 level. CAT Math scores and the NTE-WCET scores share a common variance of 18.59 percent.

Decision: Based on the findings hypothesis six was accepted.

H₇: There will be a significant correlation between CAT English scores and the NTE-WCET scores.

Hypothesis seven predicted a significant correlation between CAT-English scores and the NTE-WCET scores. The correlation coefficient was .62343, which was statistically significant at the .0001 level. CAT English scores and NTE-WCET scores share a common variance of 38.86 percent.

Decision: Based on the findings hypothesis seven was accepted.
H8: There will be a significant correlation between the Professional Education sequence grade-point average and the NTE-WCET scores.

Hypothesis eight predicted a significant correlation between Professional Education sequence grade-point average and the NTE-WCET scores. The correlation coefficient was .59491, which was statistically significant at the .0001 level. Professional Education sequence grade-point average and NTE-WCET scores share a common variance of 35.39 percent.

Decision: Based on the findings hypothesis eight was accepted.

Correlation of Combined Selected Predictor Variables with NTE-WCET Scores

H9: The combination of the variables sex, level, ACT composite score, teacher education admission grade-point average, CAT Reading score, CAT Math score, CAT English score, and Professional Education sequence grade-point average will correlate significantly with NTE-WCET scores.

Hypothesis nine of this study stated that there would be a significant correlation between the combination of all the variables and NTE-WCET scores. The variables were sex, level, ACT composite score, teacher education admission grade-point average, CAT Reading score, CAT Math score, CAT English score, and Professional Education sequence grade-point average.
The results of the multiple regression analysis are shown in Table 3, page 78, and Table 4, page 79. Data in the tables show that the predictor ACT composite score \( (X_3) \) correlated 0.86157 with NTE-WCET scores, and had an \( R^2 \) of 0.74230. The \( F \) ratio was 279.41, which was statistically significant at the .0001 level.

The CAT Reading score \( (X_5) \) was the second variable to enter. It increased the \( R \) to 0.88574. There was an increase in the \( R^2 \) of 0.04223, which was statistically significant at the .05 level. The \( R^2 \) for the combination of \( X_3 \) and \( X_5 \) was 0.78453 with an \( F \) ratio of 174.77. This combination was significant at the .0001 level.

The third variable entered was CAT English score \( (X_7) \). It increased the \( R \) to 0.89585. There was an increase in the \( R^2 \) of 0.01802, which was statistically significant at the .05 level. The \( R^2 \) for the combination of \( X_3, X_5, \) and \( X_7 \) was 0.80255. The \( F \) ratio for this three variable combination was 128.71, which was significant at the .0001 level.

The fourth variable entered was teacher education admission grade-point average \( (X_4) \) which increased the \( R \) to 0.89921. The \( R^2 \) increase was 0.00604, which was not statistically significant at the .05 level. The combination of \( X_3, X_5, X_7, \) and \( X_4 \) yielded an \( R^2 \) of 0.80859, which was significant at the .0001 level with an \( F \) ratio of 99.28.
### Table 3

Significance of the Combination of Predictor Variables to the NTE-WCET Scores

<table>
<thead>
<tr>
<th>Combined Variables*</th>
<th>Multiple R</th>
<th>F Value Achieved</th>
<th>F Value Needed</th>
<th>DF**</th>
<th>p &gt; R</th>
</tr>
</thead>
<tbody>
<tr>
<td>X₃</td>
<td>.86157</td>
<td>279.41</td>
<td>3.95</td>
<td>1/97</td>
<td>.0001</td>
</tr>
<tr>
<td>X₅</td>
<td>.88574</td>
<td>174.77</td>
<td>3.10</td>
<td>2/96</td>
<td>.0001</td>
</tr>
<tr>
<td>X₇</td>
<td>.89585</td>
<td>128.71</td>
<td>2.71</td>
<td>3/95</td>
<td>.0001</td>
</tr>
<tr>
<td>X₄</td>
<td>.89921</td>
<td>99.28</td>
<td>2.48</td>
<td>4/94</td>
<td>.0001</td>
</tr>
<tr>
<td>X₁</td>
<td>.89990</td>
<td>79.21</td>
<td>2.33</td>
<td>5/94</td>
<td>.0001</td>
</tr>
<tr>
<td>X₆</td>
<td>.90038</td>
<td>65.66</td>
<td>2.21</td>
<td>6/92</td>
<td>.0001</td>
</tr>
<tr>
<td>X₈</td>
<td>.90042</td>
<td>55.70</td>
<td>2.13</td>
<td>7/91</td>
<td>.0001</td>
</tr>
<tr>
<td>X₂</td>
<td>.90043</td>
<td>48.21</td>
<td>2.06</td>
<td>8/90</td>
<td>.0001</td>
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</table>

*Combined Variables are those indicated on the line in combination with the variables preceding it.

**DF = Degrees of Freedom.
Table 4

Significance of Each Predictor Variable When Added to the Combination of Variables in the Regression Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Multiple R</th>
<th>R²</th>
<th>R² Improvement</th>
<th>F Value Achieved</th>
<th>F Value Needed</th>
<th>DF**</th>
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<td>.86157</td>
<td>.74230</td>
<td>279.4190*</td>
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<td>X5</td>
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<td>.78453</td>
<td>18.8157*</td>
<td>3.956</td>
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<td>X7</td>
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<td>.80255</td>
<td>8.67013*</td>
<td>3.955</td>
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<td>X4</td>
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<td>3.954</td>
<td>1/94</td>
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<td>X1</td>
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<td>.60149</td>
<td>3.953</td>
<td>1/93</td>
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<tr>
<td>X6</td>
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<td>.81068</td>
<td>.41792</td>
<td>3.952</td>
<td>1/92</td>
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<tr>
<td>X8</td>
<td>.90042</td>
<td>.81076</td>
<td>.03847</td>
<td>3.951</td>
<td>1/91</td>
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<td>X2</td>
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<td>.81079</td>
<td>.01427</td>
<td>3.950</td>
<td>1/90</td>
<td></td>
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*F Value = Significant at .05.

**DF = Degrees of Freedom.
The fifth variable entered was sex ($X_1$) which increased the $R$ to .8990. The $R^2$ increase was .00123, which was not statistically significant at the .05 level. The five variable combination of $X_3$, $X_5$, $X_7$, $X_4$, and $X_1$ was significant at the .0001 level with an $F$ value of 79.21.

CAT Hath scores ($X_6$) were entered as the sixth variable. Upon its entrance the $R$ increased to .90038. The $R^2$ increase due to this factor was .00086, which was not significant at the .05 level. The six variable combination of $X_3$, $X_5$, $X_7$, $X_4$, $X_1$, and $X_6$ had an $R^2$ of .81068, which was significant at the .0001 level with an $F$ value of 65.66.

Professional Education sequence grade-point average ($X_8$) was the seventh variable entered. Its inclusion increased the $R$ to .90042 and the $R^2$ by .00008. The increase in $R^2$ was not statistically significant at the .05 level. The seven variable combination of $X_3$, $X_5$, $X_7$, $X_4$, $X_1$, $X_6$, and $X_8$ yielded an $R^2$ of .81076, which was statistically significant at the .0001 level with an $F$ value of 55.70.

The last variable entered was teaching level. The $R$ and $R^2$ increase were almost negligible at .90043 and .00003 respectively. The $R^2$ increase was not statistically significant at the .05 level. The combination of all eight variables yielded an $R^2$ of .81079, which was statistically significant at the .0001 level with an $F$ value of 48.21.
The combination of all eight variables share a common variance with the NTE-WCET scores of 81.079 percent. The combination of \( X_3 \), \( X_5 \), and \( X_7 \) account for 80.255 percent of the common variance with the NTE-WCET scores. The remaining five variables, \( X_1 \), \( X_2 \), \( X_4 \), \( X_6 \), and \( X_8 \), account for .824 percent of the shared common variance with NTE-WCET scores.

Table 5, page 82, indicates the regression coefficients which are used in the prediction equation. The prediction equation utilizing all eight variables would be:

\[
y^1 = 43.763 + (7.728)(X_1) + (.936)(X_2) + (8.884)(X_3) + (18.04)(X_4) + (5.346)(X_5) + (-.479)(X_6) + (2.382)(X_7) + (3.156)(X_8)
\]

Table 6, page 83, presents the regression coefficients for the combination of variables \( X_3 \), \( X_5 \), and \( X_7 \). The following prediction equation is formulated for this combination.

\[
y^1 = 57.479 + (9.568)(X_3) + (5.725)(X_5) + (2.632)(X_7)
\]

Decision: Based on the findings hypothesis nine was accepted.
Table 5
Regression Coefficients for the Eight Predictor Variable Combination

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<th>Prob &gt; F</th>
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*Intercept = 43.763 (point where the regression slope intercepts the y axis).*
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<td>$X_5$</td>
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*Intercept = 54.489 (point where the regression slope intercepts the $y$ axis).
Chapter 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The problem of this study was to determine the relationships among selected predictors to the National Teacher Examination-Weighted Common Examination. The results of this determination should identify variables and combinations of variables which best predict National Teacher Examination-Weighted Common Examination (NTE-WCET) scores. The identified variables for the purpose were sex, level, American College Test composite scores, teacher education admission grade-point averages, California Achievement Test scores in Reading, Mathematics, and English, and Professional Education sequence grade-point averages. Nine hypotheses comprised the basis of this study. The first eight hypotheses pertained to the bivariate relationship of each predictor variable and the NTE-WCET scores. Hypothesis nine concerned the relationships of combinations of the predictor variables to the NTE-WCET scores.

The data gathering instruments were the American College Test, Scholastic Aptitude Test, California Achievement Test—subtest 2, 4, 5, and 6, and the National
Teacher Examination. The American College Test and Scholastic Aptitude Test were taken prior to college entrance. The California Achievement Test was administered prior to teacher education admittance. The subjects took the National Teacher Examination during one of the three testing periods in 1981. Sex, level, teacher education admission grade-point averages and Professional Education sequence grade-point averages were obtained from student transcripts maintained in the Office of Admissions and Records. The 99 subjects of this study were drawn from the 186 applicants for initial teaching certification in Tennessee during the 1981 calendar year. Selection was dependent upon the subjects having the grade-point averages and scores used as variables recorded and reported to East Tennessee State University.

Pearson product-moment and point biserial correlations were utilized to determine the relationship between each predictor variable and the NTE-WCET scores. Multiple regression analysis was employed to determine the combination of variables which correlate significantly with the NTE-WCET scores. A relationship was considered significant at the .05 level.

Analysis of the relationship of each predictor variable with the NTE-WCET scores showed that sex and teaching level did not correlate significantly with the NTE-WCET scores. ACT composite scores, CAT Reading scores, CAT Math scores, CAT English scores, teacher education
admission grade-point averages, and Professional Education sequence grade-point averages correlated significantly with the NTE-WCET scores at the .0001 level. ACT composite scores and CAT Reading scores each shared the greatest common variance with NTE-WCET scores at 74.23 percent and 61.88 percent respectively. Analysis of a significant correlation between the NTE-WCET scores and a combination of all eight predictor variables showed a significant correlation at the .0001 level. Analysis of the significance of each predictor variable to $R^2$ increase showed that ACT composite scores, CAT Reading scores, and CAT English scores were significant at the .05 level. Sex, teaching level, CAT Math scores, teacher education admission grade-point averages, and Professional Education sequence grade-point averages did not significantly increase the $R^2$ when added to the model.

Conclusions

The following conclusions were warranted by the analyses of data reported in Chapter 4:

1. Among teacher education applicants at East Tennessee State University, the relationship between sex and the NTE-WCET score is not statistically significant.

2. Among teacher education applicants at East Tennessee State University, the relationship between teaching level and the NTE-WCET score is not statistically significant.
3. Among teacher education applicants at East Tennessee State University, there is a statistically significant correlation between (a) the student ACT Composite score and the NTE-WCET score; (b) the teacher education admission grade-point average and the NTE-WCET score; (c) the CAT Reading score and the NTE-WCET score; (d) the CAT Math score and the NTE-WCET score; (e) the CAT English score and the NTE-WCET score; and (f) the Professional Education sequence grade-point average and the NTE-WCET score.

4. Among teacher education applicants at East Tennessee State University, the use of a combination of all variables used in this study provides a better prediction of scores on the NTE-WCET score than does any single variable.

5. Among teacher education applicants at East Tennessee State University, the three variables which provide increments of significant value to the regression model, and therefore to the predictive value for scores on the NTE-WCET scores, are the ACT Composite score, CAT Reading score, and CAT English score. Therefore, a prediction equation based upon these three variables could be effectively applied in determining NTE-WCET achievement for preservice teachers at East Tennessee State University.
Recommendations

The following suggestions are offered for future research as a result of this study:

1. A similar study should be conducted using the revised form (1982) of the National Teacher Examination.

2. Demographic information in this study was limited to sex and teaching level. A similar study which included other demographic information, such as marital status, age, race, and family size, would be helpful and beneficial to students and vocational counselors.

3. This study examined intellectual measures of achievement and aptitude. A similar study which examined and included personality factors might be beneficial in teacher candidate selection.

4. High school rank and/or grade-point average should be considered for inclusion as predictor variables in a similar study.

5. Studies should be conducted using other preservice teachers at different state universities in Tennessee. The compilation and comparison of data could provide information to teacher preparation program officials and certification agencies on the determination of NTE achievement.
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SELECTED BIBLIOGRAPHY

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APPENDIX A

CORRESPONDENCE
July 19, 1982

Dr. William Pafford
Associate Dean
College of Education
Campus

Dear Dr. Pafford:

Christine M. Ejlali is currently engaged in educational research for her doctoral dissertation in the Department of Supervision and Administration. The purpose of her study is to predict the achievement of senior education majors on the NTE by correlating their ACT or SAT scores, high school grade-point average, CAT scores, teacher education admission grade-point average, and professional education sequence grade-point average.

She will need access to files in the College of Education and the Office of Admissions and Records to secure these scores and grade-point averages. The names of the students, drawn from records maintained by the Certification Analyst, will be matched with corresponding numbers and anonymity will be maintained by the researcher. Your permission to obtain the required data is being sought to facilitate this beneficial study.

Upon your request a copy of the final results will be sent to you. Your approval and promptness will be greatly appreciated.

Sincerely yours,

Clyde L. Orr
Chairman
Graduate Advisory Committee

Christine M. Ejlali
Doctoral Student

CLO&CME/cp
July 23, 1982

Dr. Clyde L. Orr, Chairman
Department of Supervision and Administration
East Tennessee State University
Johnson City, Tennessee 37614

Dear Dr. Orr:

The study by Ms. Christine Ejiali, which you have described, seems appropriate and worth-while. We will be happy to provide her with access to files in the College of Education.

While the Office of Admissions must make any decision regarding their files, I recommend that Ms. Ejiali be allowed access under the conditions which you have outlined. The results of her study should be of especial value to Admissions personnel.

Very sincerely,

William N. Pafford
Associate Dean

WNP: mh

cc: Dean Charles Edwards
    Mr. O. E. Price
    Ms. Christine Ejiali
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NAME ___________________________  SS ___________
APPENDIX C

DATA ON SUBJECTS
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APPENDIX D

MEAN, STANDARD DEVIATIONS, AND COMPARISONS OF CORRELATION COEFFICIENTS BY SEX AND LEVEL
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<td>17.805</td>
<td>4.654</td>
<td>17.500</td>
</tr>
<tr>
<td>$X_4$</td>
<td>3.109</td>
<td>.496</td>
<td>2.904</td>
<td>.499</td>
<td>3.164</td>
</tr>
<tr>
<td>$X_5$</td>
<td>34.030</td>
<td>4.348</td>
<td>33.524</td>
<td>4.895</td>
<td>34.167</td>
</tr>
<tr>
<td>$X_6$</td>
<td>33.596</td>
<td>5.813</td>
<td>32.571</td>
<td>6.668</td>
<td>33.872</td>
</tr>
<tr>
<td>$X_7$</td>
<td>54.616</td>
<td>5.201</td>
<td>51.286</td>
<td>5.868</td>
<td>55.513</td>
</tr>
<tr>
<td>$y$</td>
<td>566.354</td>
<td>82.516</td>
<td>555.286</td>
<td>87.166</td>
<td>569.333</td>
</tr>
</tbody>
</table>
### COMPARISONS OF BIVARIATE COEFFICIENT CORRELATIONS
**BETWEEN PREDICTOR VARIABLES AND NTE-WCET BY SEX**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total Sample (N = 99)</th>
<th>Males (N = 21)</th>
<th>Females (N = 78)</th>
<th>Male/Female Correlation Z Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X_2$</td>
<td>.01040</td>
<td>-.06822</td>
<td>.06421</td>
<td>-.0381</td>
</tr>
<tr>
<td>$X_3$</td>
<td>.86157</td>
<td>.83834$^b$</td>
<td>.86869$^b$</td>
<td>.4236</td>
</tr>
<tr>
<td>$X_4$</td>
<td>.66454</td>
<td>.66815$^b$</td>
<td>.66645$^b$</td>
<td>.0137</td>
</tr>
<tr>
<td>$X_5$</td>
<td>.78664</td>
<td>.85612$^b$</td>
<td>.76373$^b$</td>
<td>1.5076$^a$</td>
</tr>
<tr>
<td>$X_6$</td>
<td>.43117</td>
<td>.23379</td>
<td>.49260$^b$</td>
<td>.8053</td>
</tr>
<tr>
<td>$X_7$</td>
<td>.62343</td>
<td>.58453$^b$</td>
<td>.65910$^b$</td>
<td>.4694</td>
</tr>
<tr>
<td>$X_8$</td>
<td>.59491</td>
<td>.67303$^b$</td>
<td>.57411$^b$</td>
<td>.61822</td>
</tr>
</tbody>
</table>

$a = $ Significant at .20.

$b = $ Significant at .01.
### Comparisons of Bivariate Coefficient Correlations Between Predictor Variables and NTE-WCET by Teaching Level

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total Sample (N = 90)</th>
<th>Elementary (N = 54)</th>
<th>Secondary (N = 45)</th>
<th>Secondary/Elementary Correlation Z Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1</td>
<td>-.06995</td>
<td>.00611</td>
<td>-.13247</td>
<td>-.0610</td>
</tr>
<tr>
<td>X3</td>
<td>.86157</td>
<td>.84236&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.88405&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.8202</td>
</tr>
<tr>
<td>X4</td>
<td>.66454</td>
<td>.62402&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.72720&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.9183</td>
</tr>
<tr>
<td>X5</td>
<td>.78664</td>
<td>.84322&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.73662&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.379&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>X6</td>
<td>.43117</td>
<td>.37606&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.48424&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.6442</td>
</tr>
<tr>
<td>X7</td>
<td>.62343</td>
<td>.61339&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.63402&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.2529</td>
</tr>
<tr>
<td>X8</td>
<td>.59491</td>
<td>.56478&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.66794&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.8048</td>
</tr>
</tbody>
</table>

<sup>a</sup> = Significant at .20.

<sup>b</sup> = Significant at .01.
VITA

CHRISTINE S. EJLALI

Personal Data:
Date of Birth: October 8, 1945
Place of Birth: Detroit, Michigan
Marital Status: Married

Education:
St. Ladislaus Elementary School,
Hamtramack, Michigan.
Public Schools, Roseville, Michigan
Northern Michigan University, Marquette, Michigan.
Wayne State University, Detroit, Michigan.
East Tennessee State University,
Johnson City, Tennessee; history, political science, B.S., 1969.
East Tennessee State University,
East Tennessee State University,
Johnson City, Tennessee; supervision and administration, ED.D., 1982.

Professional Experience:
Research Assistant; East Tennessee State University, 1969-1971.
Title III Reading Teacher; Bristol, Virginia, 1971-1972.
Elementary Teacher; Johnson City, Tennessee, 1972 to present.
Reading Textbook Selection Committee; Johnson City, Tennessee, 1972-73.
Chairman Citywide 2nd Grade Teachers; Johnson City, Tennessee, 1975-1976.
Supervisor of Student Teachers; East Tennessee State University, 1981-1982.
Instructor-Elementary Science Education; East Tennessee State University, Spring, 1982.
Supervision Practicum; Kingsport City Schools, Fall, 1981.
Professional Organizations:
- Phi Delta Kappa
- Phi Kappa Phi
- Alpha Delta Kappa
- Tennessee Reading Association
- Tennessee Association of Supervision and Curriculum Development.
- Johnson City Education Association
- Tennessee Education Association
- National Education Association
- Tennessee Association of Science Teachers.

Honors and Awards:
- Outstanding Young Educator, 1972
- Recipient of Highest Merit Pay in Title III "Right to Read" Program; Bristol, Virginia, 1972.