

A COMPARATIVE STUDY OF SCORES ON THE STATE OF  
OKLAHOMA CERTIFICATION EXAMINATION, THE  
UNDERGRADUATE ASSESSMENT PROGRAM  
EXAMINATION, AND THE MAJOR FIELD  
GRADE-POINT AVERAGE OF PHYSICAL  
EDUCATION MAJORS AT OKLAHOMA  
STATE UNIVERSITY

By

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## CHAPTER I

### INTRODUCTION

The future of our schools and possibly our society hinges upon the proper preparation and selection of our school's teachers. Common practice has been to grant a teaching certificate to any person who could complete with a satisfactory grade-point average a course of study in an approved program of higher education. Such a certificate enabled the person to accept a teaching position in the area of certification.

Recently the trend has begun to change. In several areas around the country the completion of a degree has not been adequate enough to guarantee teacher certification. The passage of a certification (curriculum) examination and/or the display of adequate and appropriate generic and specific teaching skills have also been required.

The author's major concern during this study has not been to judge the reliability or the validity of grade-point averages or standardized tests. The intention has been merely to show the relationship of these forms of evaluation to each other.

#### Statement of the Problem

This research was designed to identify the relationship among the major field grade-point average, the score achieved on the Undergraduate Assessment Program Examination (UAP), and the score achieved on the State

Of Oklahoma Certification Examination of physical education majors at Oklahoma State University.

### Significance of the Study

With the recent passage of the Oklahoma Teacher Reform Act of 1980 (House Bill 1706), a standardized test has become mandatory for all persons requesting teacher certification in the State of Oklahoma. There has been a need for a close look at not only the state certification examination results but also the results of other standardized tests designed to evaluate prospective teachers. A comparison of these results to the grade-point averages being earned by students in their major field of study has helped to add insight into the level of preparation they have received towards the taking of such standardized tests.

Questions that arose during the study were:

1. Have the grades which have been given in colleges and universities been equivalent to the knowledge that has been acquired?
2. Have the courses that have been taught in the major field of study been satisfactory preparation for the students successfully to complete standardized tests?
3. Have the courses that have been taught in the major field of study been satisfactory preparation for teaching success?
4. Have the Educational Testing Service (ETS) examinations and the State of Oklahoma certification examinations produced the same results?

### The Subproblems

The First Subproblem: The first subproblem dealt with the student's grade-point average (GPA) and its relationship to the score obtained on the Undergraduate Assessment Program Examination (UAP).



The Second Subproblem: The second subproblem dealt with the student's GPA and its relationship to the score obtained on the State of Oklahoma Certification Examination.

The Third Subproblem: The third subproblem dealt with the score obtained on the UAP Examination and its relationship to the score obtained on the State of Oklahoma Certification Examination.

#### The Hypotheses

The First Hypothesis: There is a statistically significant correlation among the student's GPA, the score obtained on the UAP Examination, and the score obtained on the State of Oklahoma Certification Examination.

The Second Hypothesis: There is a statistically significant correlation between the student's GPA and the score achieved on the UAP Examination.

The Third Hypothesis: There is a statistically significant correlation between the student's GPA and the score achieved on the State of Oklahoma Certification Examination.

The Fourth Hypothesis: There is a statistically significant correlation between the score obtained on the UAP Examination and the score obtained on the State of Oklahoma Certification Examination.

#### Limitations

The research would have benefited from a larger population size. At the time of the study there was a limited number, ten matched pairs of scores, of Oklahoma State University physical education majors who had participated in both the UAP Examination and the State of Oklahoma Certification Examination.

### Delimitations

This study included only those Oklahoma State University physical education majors who had participated in the UAP Examination and the State of Oklahoma Certification Examination.

### Assumptions

The First Assumption: The first assumption is that the results of this study can be used to determine correlation of GPA and scores on the UAP and State of Oklahoma Certification Examination for all Oklahoma State University physical education majors.

The Second Assumption: The second assumption is that the grades in the major field courses were assigned using equally balanced scales.

The Third Assumption: The third assumption is that the testing conditions and procedures were equal for all students during the UAP Examination.

The Fourth Assumption: The fourth assumption is that the testing conditions and procedures were equal for all students during the State of Oklahoma Certification Examination.

### Definition of Terms

The following definitions will make more explicit the meaning of terms used in this study:

1. GPA -- grade-point average of the twenty major field courses  
(A = 4.00)
2. HLTH -- prefix indicating a health-related course on a transcript at Oklahoma State University

3. LEIS -- prefix indicating a leisure-related course on a transcript at Oklahoma State University
4. Major Field -- a set of twenty required courses in the fields of health, physical education, leisure, and physiology for all undergraduate Oklahoma State University physical education majors
5. NTE -- National Teacher Examination
6. PE -- prefix indicating a physical education-related course on a transcript at Oklahoma State University
7. PHSIO -- prefix indicating a physiology-related course on a transcript at Oklahoma State University
8. State of Oklahoma Certification Examination (CERT) -- a test designed to measure the knowledge and competencies of first-year physical education instructors. Oklahoma State Department of Education, Teacher Testing Section, 2500 North Lincoln Boulevard, Oklahoma City, Oklahoma, 73105
9. Undergraduate Assessment Program Examination (UAP) -- a field test designed to assess the mastery of concepts, principles, and knowledge in physical education. Educational Testing Service, College and University Programs, Princeton, New Jersey, 08540

## CHAPTER II

### SELECTED REVIEW OF RELATED LITERATURE

This study deals with the correlation of major-field grade-point average, the score from the Undergraduate Assessment Program Examination, and the score from the State of Oklahoma Certification Examination of Oklahoma State University majors in physical education. Physical education is defined as that phase of the whole process of education which is concerned with vigorous muscular activities and related responses and with the modifications of the individual resultant from these responses (Nixon and Cozens, 1947). The three previously stated forms of evaluation all deal specifically with the student's realm of knowledge in physical education.

#### Use of Grades

Colleges and universities have borne the duty to prepare adequately those people wishing to become teachers. The teacher education programs were required to respect the state requirements set forth for preparation of prospective teachers; however, content, sequence, and the number of required educational courses varied within states because colleges and universities often established requirements of courses beyond the minimum (Ornstein, 1981).

Each state has a set of courses it considers mandatory for a prospective teacher. Even though the course titles are similar, wide

differences often exist in the content, the intellectual level of instruction, and the competencies required. This has been found true not only in courses of an academic nature but in professional education courses as well (Ornstein, 1981).

It is the responsibility of the agency in charge of certification to decide to rely on the institutional assurance that its graduates have acquired the requisite competencies. Many of the attributes, including important "hands-on" teaching skills, were attested to wholly by the institutions that provided the training (Shimberg, 1981). The one form of assurance that has been widely accepted is that of course grades. The student received a grade for each course taken. At the completion of her/his formal education program, the grades for all the courses were averaged together giving an overall picture of the student's level of success.

The primary weakness that has been found when using grade assignment is that there is a wide variation in marks given by different people or even by the same person at different times. Because of these variations in marking, it would be highly erroneous to compare students' performances using only this method. Such comparisons could be executed if the grades were "true". Comparison becomes a greater problem when marks in different courses are combined as holding equal value. Using the same reasoning, comparison between grades given at different universities and colleges have a questionable validity (Yadav and Roy, 1976).

An evaluation system of the standards of instruction in higher education is needed. Yadav and Roy (1976, p. 29) stated "the system of grading seems to be one of the effective ways of evaluating students' performance and reporting it to all concerned."

A major portion of grades are given based on a student's performance on internal examinations. Closely related to the problems concerning the combining of grades is another issue, that of, whether grades for external and internal examinations are to be combined or shown separately. It is granted that the two types of examinations assess the individual for different sets of objectives, thus there may be justification for showing them separately (Yadav and Roy, 1976).

#### Use of Standardized Tests

The first standardized test for teachers, the National Teacher Examination, was administered on March 29-30, 1940 in twenty-three official examination centers throughout the United States. The 1940 program was the first attempt to provide and administer a set of comprehensive examinations designed specifically for the testing of prospective teachers (Ryans, 1940). School superintendents and personnel officers were eager to use the National Teacher Examinations (NTE). "The examinations made it possible for them to avoid many local pressures and gave them what seemed to be a simple procedure for the elimination of some candidates on a supposedly objective basis" (Emens, 1947).

Thus, the NTE became an elimination process, rather than a means of assistance for effectively and intelligently selecting candidates best qualified for the jobs to be filled. In 1947 some cities began to grant or refuse teachers' certificates on the basis of the candidates passing or failing this pencil and paper test (Emens, 1947).

A large number of teachers attending summer school in the field of teacher education at Northwestern University in Evanston, Illinois and their instructors conducted a critical examination of the NTE. Their

views were expressed in a speech given by Anderson (1941) to the aforementioned group. He stated, "we doubt the validity of the tests in measuring teaching intelligence, true culture and functional teaching information" (p. 179).

Due to the nation's present mobility, a need for a comprehensive examination does exist. The content of examinations used for the certification of teachers should be determined, and the test questions written, by experts in the field with the assistance of test-development specialists in order to equally test the knowledge of prospective teachers (Shimberg, 1981). In an article concerning the National Teacher Examination and its improvement over time, Emens (1947) suggests that

over a period of years, it would be desirable for everyone to assist in devising better and more desirable means of measuring teacher competencies with the expectation that we shall be able to achieve better results in teacher selection only if we are able to achieve better methods of teacher appraisal and to utilize judiciously those which are developed (p. 47).

Among the criticisms of the National Teacher Examination was the fear that a national examination would interfere with the local autonomy of teacher-preparation institutions. Collins (1940) countered this fear with the statement, "even if these examinations were bad (and there was every indication that they were not) they were better instruments for the selection of teachers on the bases they measured than no examination at all" (pp. 4-5).

One of the reasons standardized testing has been so widely accepted is that an hour or two of testing can provide a substantial amount of information on individuals that can be used for activities ranging from personnel assignment to program evaluation (Haney, 1981). The use of standardized tests toward the certification of prospective teachers has

also provided necessary legal protection for school boards and for the children who will receive instruction from the candidates finally selected (O'Reilly, 1981).

When it is known that a standardized test is to be administered at the end of the student's course of study, it is up to both the student and the instructor to adequately prepare for the examination. The difficulty of this task lies in the fact that the examinations are prepared, administered, and interpreted by unknown persons.

Leaving aside the possibility of error due to the subjectivity of the examiner and various other factors, the very fact that judgments about individuals are made on the basis of a single shot examination held in unnatural conditions appears to be extremely unfair to those who would have done much better than others had they been exposed to similar social and school conditions (Misra, 1979, p. 27).

Our system has depended on the diploma for many years and continues to demand that schools perform better. It has become common to identify formal education with examination and we have made it the focal point-exclusive channel to career and opportunity (Sen, 1977). Not only has one single examination been used to judge a student, but often it is an examination of questions and problems designed to test widely different types of knowledge and skill for which only an overall score is reported. It has been quite possible for an applicant who may be very weak in important areas to pass such a test by being strong in other areas (Shimberg, 1981).

Psychologist Barbara Lerner, former study director of the National Academy of Sciences Committee on Ability Testing and Fred Hargadon 1980 chairman of the College Boards Board of Trustees, expressed the trustees' opinions on the use of standardized testing. Lerner suggested specifically that leaders of the National Education Association oppose standardized



tests because such tests merely reveal what an inadequate job educators have been doing. Hargadon suggested that much of the support for the elimination of objective testing actually has come from those who, having "made it" on merit, want to change the ground rules by which their offspring will be judged (Haney, 1981).

The Nairn/Nader Report is a 554-page Ralph Nadar report on the Educational Testing Service authored by Nairn and published under the title The Reign of ETS: The Corporation That Makes Up Minds. The report was a criticism of standardized testing, specifically those tests conducted by the Educational Testing Service. The basis of the report formulated by Nairn and Associates (1980) can be found in the first two sentences of the report:

The conception for this report on the Educational Testing Service began with the victims of standardized testing. Some of these students would come up to me [Ralph Nadar] at colleges and universities around the country to express a feeling that they had been unjustly judged by a three hour exam (p. ix.).

Much criticism has been voiced about the generalities of the Nairn/Nader report, i.e., "victims", "some students", "expressed feelings", and "judged unjustly" (Mehrens, 1981).

The Undergraduate Assessment Program (UAP) is administered by the Educational Testing Service (ETS) under the policies determined by the Undergraduate Assessment Program Council. The Council is an independent board established with the cooperation of the Graduate Record Examinations Board (Educational Testing Service, 1978).

The UAP field test for physical education was developed by a committee of college teachers selected with the advice of the American Association for Health, Physical Education, and Recreation (AAHPER). These committee members came from a variety of colleges and universities

across the United States. The goals of this field test were to assess the mastery of concepts, principles, and knowledges in specific subjects expected of students at the conclusion of their major study. They were, however, designed to measure not only factual knowledge but also the student's ability to analyze and solve problems, understand relationships, and interpret material in their major field. The total test score was composed of scores from the following seven areas: history and philosophy of the program including goals and objectives; uses of evaluation; organization and administration of the program; curriculum and methods; scientific foundations; activities; and professional concerns (Educational Testing Service, 1978).

The primary advantage of the UAP Examination was that it provided an objective and standard measure and offered the same or an equivalent set of tasks for students in many institutions. This primary advantage was also one of the negative aspects of the UAP Examination. It was a compromise, tailored to meet the needs of a large and diverse student population rather than being based on one curriculum (Educational Testing Service, 1978).

Shimberg (1981), an employee of the Educational Testing Service, gave the following definition for certification:

Certification is the process by which a governmental or non-governmental agency grants recognition to an individual who has met certain pre-determined qualifications set by a credentialing agency. It is a way of identifying individuals who have met some standard (p. 1138).

#### Use of Certification Tests

As a general rule, the standard for certification has been set well above the minimum level required for licensure. Certification has

required the applicant to meet specified requirements related to education, training, or experience. Generally, certification has relied on the passage of a test of competence designed to distinguish between those applicants who deserve to be granted a credential and those who do not (Shimberg, 1981).

The administrators and personnel officers who hire teachers are responsible for carefully evaluating the prospective teacher's academic grades and other evaluations presented by the applicant's college or university. The trend has been, however, to judge a student's probable teaching success based upon her/his score(s) on a standardized test(s). The explicit use of standardized test scores has aided in undermining the confidence placed in colleges and universities since its use reinforces public beliefs that meaningless grades and useless evaluations have been handed out (Perry, 1981).

The question has been posed: "Does certifying a candidate's successful completion of a sequence of courses in an approved program guarantee professional competence of a beginning teacher?" (Ornstein, 1981, p. 170). Certification examinations have not been intended to predict job success (Shimberg, 1981). At a minimal level, when considered together, certification and academic endorsements have been shown to be indicators of teaching competence (O'Reilly, 1981).

Changes in teacher education programs and certification practices have helped to improve the quality of teachers who have entered the profession. Colleges and universities have had to raise academic and admission standards of teacher education programs. The states have been required to accept the responsibility of making certification requirements uniform (Ornstein, 1981).

The state's authority to certify teachers has been challenged, as was demonstrated by Florida's revision of statewide certification requirements. In 1978, the Florida legislature decided to require entry exams before teacher training and qualifying exams before certification (Ornstein, 1981). Other states have been active in this substantial move toward more dependence upon examination and less upon completion of an approved collegiate program as the primary proof of teaching competence. Texas, Tennessee, Arizona and Louisiana have all begun using examination/experience. Florida has devised its own Teacher Certification Written Examination. The University of Kansas has initiated its own fifth-year student teaching program (O'Reilly, 1981). Certification in the states of Georgia and Oklahoma is given after completion of an accredited program, the receipt of a passing grade on a certification (curriculum) examination, and a display of competency for one year in a classroom while being observed for both generic and specific teaching skills (O'Reilly, 1981).

The Oklahoma Teacher Reform Act of 1980 (House Bill 1706) established three criteria as the measure of teacher competence:

1. completion of an approved teacher education program;
2. successful completion of an entry-year teaching experience;
3. passing score on a standardized, externally prepared, administered, and scored content knowledge examination (Oklahoma State Department of Education, 1981, p. 4).

Any person who has graduated since January 31, 1982 from an institution of higher education and is seeking teaching certification in Oklahoma has been required to pass the State of Oklahoma Certification Examination. The only exceptions have been those who graduated prior to January 31, 1982 and met approved program certification requirements or any person

who already held a valid teaching certificate (Oklahoma State Department of Education, 1981).

After completion of 90 hours of coursework and prior to their full-year of internship, each candidate for Oklahoma teacher certification has been required to pass the State of Oklahoma Certification Examination. The examination has been developed and administered by the State Department of Education with recommendations made by the Professional Standards Board. These examinations were geared toward the various subject areas and grade levels covered by the certification. Consultation with classroom teachers and higher education instructors was required during the development of the examinations. The educational research firm, National Education Systems, Inc., assisted in the development of the test and has contracted to administer and score them. The State of Oklahoma Certification Examination was developed to ensure:

1. entry-level teachers will have the knowledge and competencies needed to teach in a classroom;
2. teachers are tested on content knowledge that is actually related to the job (Oklahoma State Department of Education, 1981, p. 1).

Subject to the limits set by the Professional Standards Board, the student has been allowed to take the examinations appropriate to her/his teaching speciality or level of achievement on students in all the various teacher education programs in the state (Kleine and Wisniewski, 1981).

The field of physical education has been covered by a single one-hundred-twenty item general test in health and physical education. The test has been criterion-referenced in the following three ways:

1. each set of questions has been designed to measure an individual's performance on specific instructional objectives;

2. the score has indicated mastery or non-mastery;
3. the scores have not been influenced by the scores of others who have taken the test (Oklahoma State Department of Education, 1981, p. 4).

The examination has been composed using the following five subareas: school health programs; physical education programs; physical education activities; personal, family, consumer, and community health; health and physical education sciences. For grading purposes, the cut-off scores have been established with assistance from panels of Oklahoma educators who reviewed the test. No set percentage of applicants has been chosen to pass or fail (Oklahoma State Department of Education, 1981).

After completion of coursework and a passing grade on the State of Oklahoma Certification Examination and prior to one year of internship, the student is issued a licence. This licence entitles the candidate for Oklahoma certification to teach for one year. During this year, the candidate will be observed by a committee to determine her/his teaching competency (O'Reilly, 1981).

#### Previous Related Studies

The following items represent a selected partial review of related studies that have been completed. The following reference materials were used during the search for related studies: Current Index to Journals in Education (CIJE); Dissertation Abstract; Education Index; Reader's Guide; Resources in Education (RIE).

In a study conducted by Jenkins in 1977, 77 first-year teachers in the Mississippi public schools completed the Thomson and Handley's Student Teaching Competency Evaluation Questionnaire (STCEQ). Each of these teachers was a graduate of Mississippi State University in either

May or August, 1977, with a Bachelor's Degree. The results of the study clearly indicated that good grades in college correlated with subsequent success in teaching on a number of teaching criteria. He found that the most significant single factor for prediction of teaching competence was grade-point average. Grade-point average was found to be significant at the .01 level with  $N=77$  (Jenkins, 1978).

Fratiani conducted a similar study in 1979 using 250 teachers who had graduated from the University of Northern Iowa during the spring or summer of 1976. Three academic variables were shown to be the most significant predictors of teaching success. These variables included overall grade-point average, a teaching assignment in the new teacher's major, and student teaching performance (Fratiani, 1979).

On a comprehensive survey of studies related to this area, Morsh and Wilder examined 66 studies, 35 focused on overall grade-point averages. A positive correlation ranging from zero to .73 was reported in 31 of the cases between grade-point average and teaching effectiveness (Perry, 1981).

#### Summary

In a selected review of literature, the investigator found information of a conflicting nature. The use of a student's grade-point average and completion of an approved program have been used for many years as the sole indicator of a student's potential for teaching success. With the questioning of the validity of grade-point averages came the use of a new method of evaluation, the use of standardized tests.

The National Teacher Examinations were the first standardized tests given for the purpose of evaluating prospective teachers. Since the

creation of the National Teacher Examination on 1940, several other standardized tests have been prepared. One test closely related to the NTE has been developed by the Educational Testing Service. The test has been known as the Undergraduate Assessment Program Examination.

There was limited evidence indicating the use of standardized test scores as a valid means of evaluating a teacher's potential for success. Due to its ease and convenience, this method has been widely accepted by administrators and personnel officers.

Recently the State of Oklahoma Department of Education has accepted the responsibility for proving the success potential of incoming teachers. This has included the formation of its own certification (curriculum) examination.

Much criticism has been voiced about the use of a single examination as an indicator of teaching capabilities and success. Previous studies have indicated that the use of grade-point averages has been a more valid method of success prediction than has the use of standardized test scores.



## CHAPTER III

### METHODS AND PROCEDURES

This study was designed to investigate three major areas and their relationships to each other. The three areas were: grade-point average; Undergraduate Assessment Program Examination score; and the State of Oklahoma Certification Examination score.

#### Sample

The subjects for this study consisted of graduates from Oklahoma State University in the field of Health and Physical Education. Only those graduates who had taken both the Undergraduate Assessment Program Examination and the State of Oklahoma Certification Examination were utilized.

#### Procedure

An investigation was conducted to determine those Oklahoma State University physical education graduates who had participated in both the Undergraduate Assessment Program Examination and the State of Oklahoma Certification Examination. One-hundred-forty-two graduates had participated in the UAP Examination. Twenty-seven graduates had participated in the State of Oklahoma Certification Examination. This investigation yielded ten matched pairs of scores. This small number of matched pairs of scores was noted as a limitation of the study.

The student's scores on the UAP Examination and the State of Oklahoma Certification Examination and major field course grades were collected from Dr. John G. Bayless, Chairman of the Department of Physical Education at Oklahoma State University. The examination scores and the grade-point averages were recorded as continuous data. The examination scores were recorded in percentiles. The grade-point averages were computed using the individual grades of each student in the following 20 academic courses:

1. HLTH 2603 - Personal Health Science
2. HLTH 2633 - Care and Prevention of Athletic Injuries
3. HLTH 2654 - Anatomy and Kinesiology
4. HLTH 3623 - School Health Programs
5. LEIS 2332 - Social, Folk and Square Dance
6. LEIS 2372 - Intermediate Swimming
7. PE 1710 - Team Sports I (Soccer, Volleyball)
8. PE 1720 - Team Sports II (Basketball, Softball)
9. PE 1730 - Individual Sports I (Tennis, Badminton)
10. PE 1740 - Individual Sports II (Gymnastics, Track and Field)
11. PE 1755 - Sport and Movement Foundations I
12. PE 1765 - Sport and Movement Foundations II
13. PE 2052 - Sports Officiating
14. PE 3763 - Physical Education and Recreation for Elementary Age Children
15. PE 3773 - Methods and Techniques of Teaching Sport
16. PE 4712 - Methods in Physical Education for Elementary Children
17. PE 4723 - Test and Measurement in Health and Physical Education

18. PE 4733 - Organization and Administration in Health and Physical Education
19. PE 4793 - Adapted Physical Education
20. PHSIO 3113 - Physiology of Exercise

Each student's grade-point average was computed using the following procedure:

Step 1: course credit hours multiplied by the grade = course credit hour points. (grade equivalents: A=4, B=3, C=2, D=1, F=0)

Step 2: each course credit hour points total added together to yield total credit hour points.

Step 3: total credit hour points was divided by total number of credit hours to yield grade-point average.

Not all of the students included in the study completed all twenty major field courses. The policy of waiving courses and the transfer of courses from other universities contributed to this situation. When encountered, this problem was dealt with by computing the grades for the portion of the twenty courses that were completed.

Prior to its release, Dr. Bayless coded the data to insure the privacy of the individual students. A nominal code letter was assigned to each student.

#### Method of Analysis

The mathematical technique used to determine the relationship between each set of data was Pearson product-moment correlation coefficient with an assumed mean of zero (Baumgartner and Jackson, 1982). This formula was named after Karl Pearson, 1857-1936, an English statistician (Bartz, 1981).

The raw score formula used for the Pearson product-moment correlation coefficient with an assumed mean of zero is as follows:

$$r = \frac{N \sum XY - (\sum X) (\sum Y)}{\sqrt{[N \sum X^2 - (\sum X)^2] [N \sum Y^2 - (\sum Y)^2]}}$$

where

$\Sigma$  indicates the sum

$\sum XY$  = the sum of the cross products of each pair of raw scores

$\sum X$  = the sum of the X raw scores

$\sum Y$  = the sum of the Y raw scores

$\sum X^2$  = the sum of squared X raw scores

$\sum Y^2$  = the sum of squared Y raw scores

$N$  = the number of pairs of scores (Wynne, 1982)

After the correlation coefficient was determined, the coefficient of determination ( $r^2$ ) was computed. Although  $r^2$  was computed, actual statistical tests are made on  $r$ . This was a more efficient manner of ascertaining the amount of relationship in the correlation. The coefficient of determination gave the proportion of the variance in one variable that was associated with the variance in the other variable (Mathews, 1973).

Tables I through III, pages 26 - 29, were formed to show the summary of the relationship between the selected variables after the Pearson product-moment correlation and the coefficient of determination were computed. Table IV, page 30, was formed to show the calculated mean and standard deviation for the UAP Examination scores, the State of Oklahoma Certification Examination scores, and the major field grade-point averages.

A bar graph was drawn to show the relationship between the selected variables after the Pearson product-moment correlation was computed. Figure 1, page 28, accents the large degree of variation in the statistical results after  $r$  was computed.

Each student's UAP Examination score percentile was compared to Table 29: Physical Education of the UP Field Test and GRE Advanced Tests - Percentile Ranks (see Appendix). The bar graph in Figure 2, page 31, was drawn to show the national UAP Examination percentile norm for 1976-1978 seniors.

To show the multiple correlation between the three research variables, three separate calculations were made. The formula used for this correlation was:

$$R_{y \cdot 1,2} = \sqrt{b_1 r_{y1} + b_2 r_{y2}}$$

$$\text{Given } b_1 = \frac{r_{y1} - r_{y2} r_{12}}{1 - r_{12}^2}$$

$$b_2 = \frac{r_{y2} - r_{y1} r_{12}}{1 - r_{12}^2}$$

(Glass and Stanley, 1970)

In order to test the significance of a multiple correlation coefficient, the multiple R must be tested as an F-ratio. To do this R is converted to an F statistic by:

$$F = \frac{R^2 / K}{(1 - R^2) / (N - K - 1)}$$

Given (K, N - K - 1) Degrees of Freedom

Where K = Number of Variables

N = Number of Subjects (Edwards, 1979)

Table V, page 32, was formed to show the summary of the relationship between the three selected variables as calculated by multiple correlation and F tests.

In addition to statistical analysis and data, appropriate narrative discussion has been used to explain the procedures and results of the study.

## CHAPTER IV

### RESULTS AND DISCUSSION

The problem in this study was to examine the degree of correlation and any significant relationship among grade-point average, UAP Examination Score, and State of Oklahoma Certification Examination score. Ten Oklahoma State University physical education majors were involved in the study. The students were required to be OSU physical education graduates who had taken both the UAP Examination and the State of Oklahoma Certification Examination. This chapter presents a statistical analysis of the data collected in the study.

#### Statistical Treatment

The mathematical procedure chosen to test hypotheses two, three and four was the Pearson product-moment correlation coefficient ( $r$ ) with an assumed mean of zero. This procedure was used to determine the relationship between the data sets (Baumgartner and Jackson, 1982). After computation of the correlation coefficient, the coefficient of determination ( $r^2$ ) was computed. This was used to determine the proportion of the variance in one variable that was associated with the variance in the other variable (Mathews, 1973).

The fourth hypothesis stated that a statistically significant correlation would be shown between the score obtained on the UAP Examination and the score obtained on the State of Oklahoma Certification

Examination. The Pearson product-moment correlation yielded a correlation coefficient of .1889 between the UAP Examination and the State of Oklahoma Certification Examination scores. A coefficient of determination was equal to .0357. The results are presented in Table I.

TABLE I  
SUMMARY OF THE RELATIONSHIP BETWEEN THE UAP EXAMINATION AND  
THE STATE OF OKLAHOMA CERTIFICATION EXAMINATION SCORES

	r	r <sup>2</sup>
UAP/CERT	.1889	.0357
N = 10		
Significance at $\alpha = .05$		Critical Value $\geq .648$

The null hypothesis was not rejected at the .05 level based on this data. Hypothesis four was not shown significant at the .05 level.

The third hypothesis stated that a statistically significant correlation would be shown between the student's GPA and the score achieved on the State of Oklahoma Certification Examination. The Pearson product-moment correlation yielded a correlation coefficient of .3018 between the student's GPA and their State of Oklahoma Certification score. A coefficient of determination was equal to .0949. The results are presented in Table II.



TABLE II

SUMMARY OF THE RELATIONSHIP BETWEEN GRADE-POINT AVERAGES  
AND STATE OF OKLAHOMA EXAMINATION SCORES

---

	$r$	$r^2$
GPA/CERT	.0381	.0949

---

N = 10

Significance at  $\alpha = .05$  Critical Value  $\geq$  .648

---

The null hypothesis was not rejected at the .05 level based on this data. Hypothesis three was not shown significant at the .05 level.

The second hypothesis stated that a statistically significant correlation would be shown between the student's GPA and the score achieved on the UAP Examination. The Pearson product-moment correlation yielded a correlation coefficient between the student's GPA and the UAP Examination score of .7000. A coefficient of determination was equal to .4900. The results are presented in Table III.

The null hypothesis was rejected at the .05 level based on this data. Hypothesis two was shown significant at the .05 level. The data show a significant relationship between the student's GPA and the score obtained by that student on the UAP Examination. The results of this study indicate that 70 per cent of a student's score on the UAP Examination is determined and predictable from the GPA. A bar graph was used in Figure 1. to illustrate the relationship of the correlation coefficient ( $r$ ) of the selected variables.

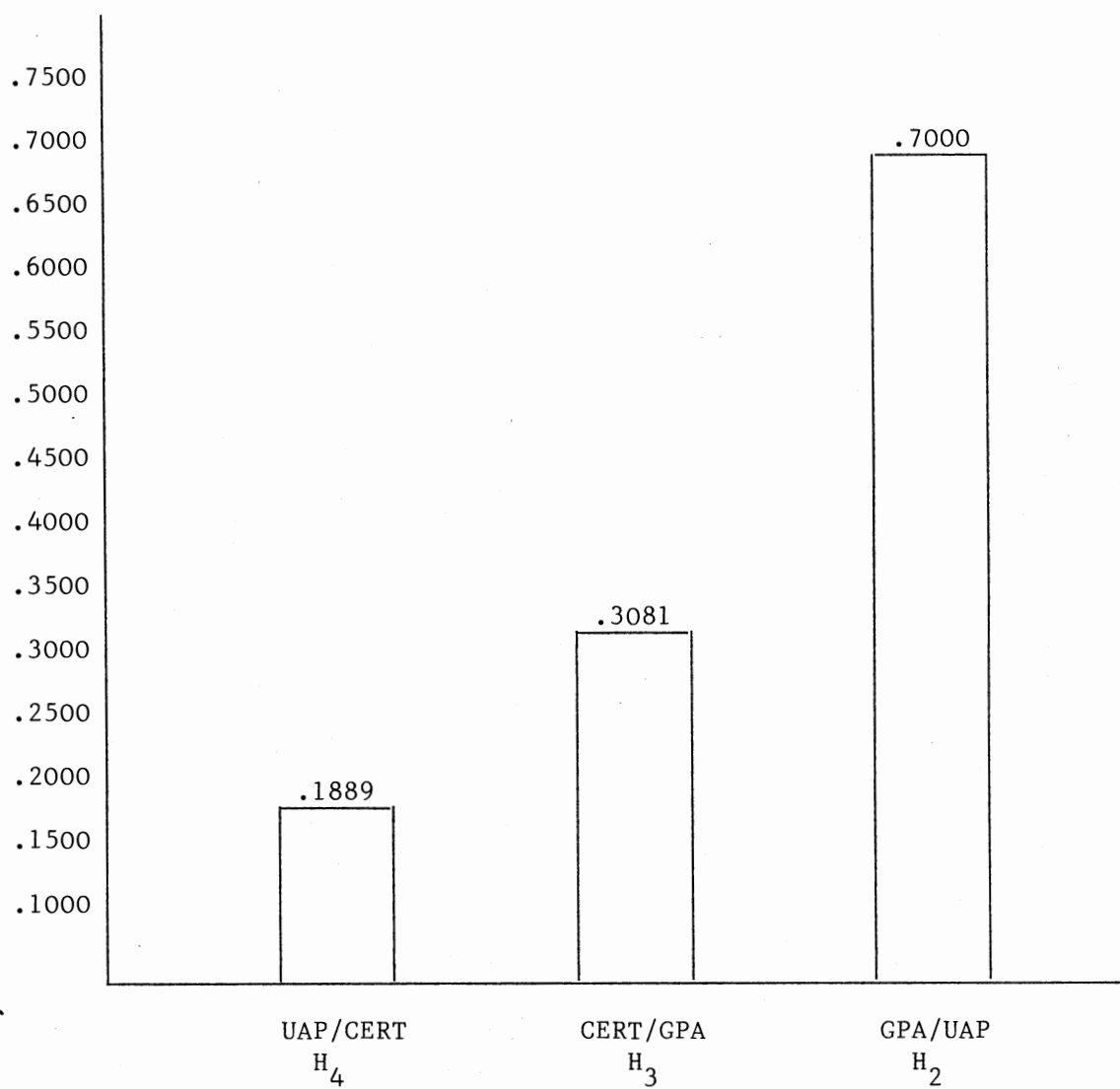


Figure 1. Percentile Comparison of the Selected Variables After Correlation Coefficient (r) Computed

TABLE III

SUMMARY OF THE RELATIONSHIP BETWEEN GRADE-POINT AVERAGES  
AND THE UAP EXAMINATION SCORES

---

	$r$	$r^2$
GPA/UAP	.7000	.4900

---

N = 10

Significance at  $\alpha = .05$  Critical Value  $\geq$  .648

---

Additional data was generated during the study. The mean and standard deviation for the percentiles of the selected variables were computed. The results of the calculated mean and standard deviation are presented in Table IV. These results indicated the average percentile of student's GPA was equal to 81.9000, UAP Examination score was equal to 75.4000, and State of Oklahoma Certification Examination score was equal to 78.3000.

Both the student's GPA and her/his State of Oklahoma Certification Examination score had a lower standard deviation, 4.9700 and 3.6225 respectively, than that of the UAP Examination score, 15.7082. This indicated a larger degree of variance between the population's UAP Examination scores than was present in their GPA's or State of Oklahoma Certification Examination Scores.

To further illustrate the high degree of variation in student's UAP Examination scores, each student's UAP Examination score was

compared to the National UAP Percentile Norms for 1976-1978 Seniors (see Appendix). These comparisons are presented in Figure 2.

TABLE IV  
CALCULATED MEAN AND STANDARD DEVIATION FOR  
THE PERCENTILES OF THE SELECTED VARIABLES

	Mean	Standard Deviation
GPA*	81.9000	4.9700
UAP	75.4000	15.7082
CERT	78.3000	3.6225

\*Calculated as a percentile

Of the ten students in the study, four scored below the 15th percentile, three scored between the 58th and 49th percentiles, and three scored between the 66th and 70th percentile. The percentile norms were based on a maximum percentile of 100 and a minimum percentile of zero.

The first hypothesis, and major emphasis of this study, stated a significant correlation would be shown among the student's GPA, the score obtained on the UAP Examination, and the score obtained on the State of Oklahoma Certification Examination.

A multiple correlation with a statistical test of F was used to test the hypothesis. A multiple-correlation coefficient was computed

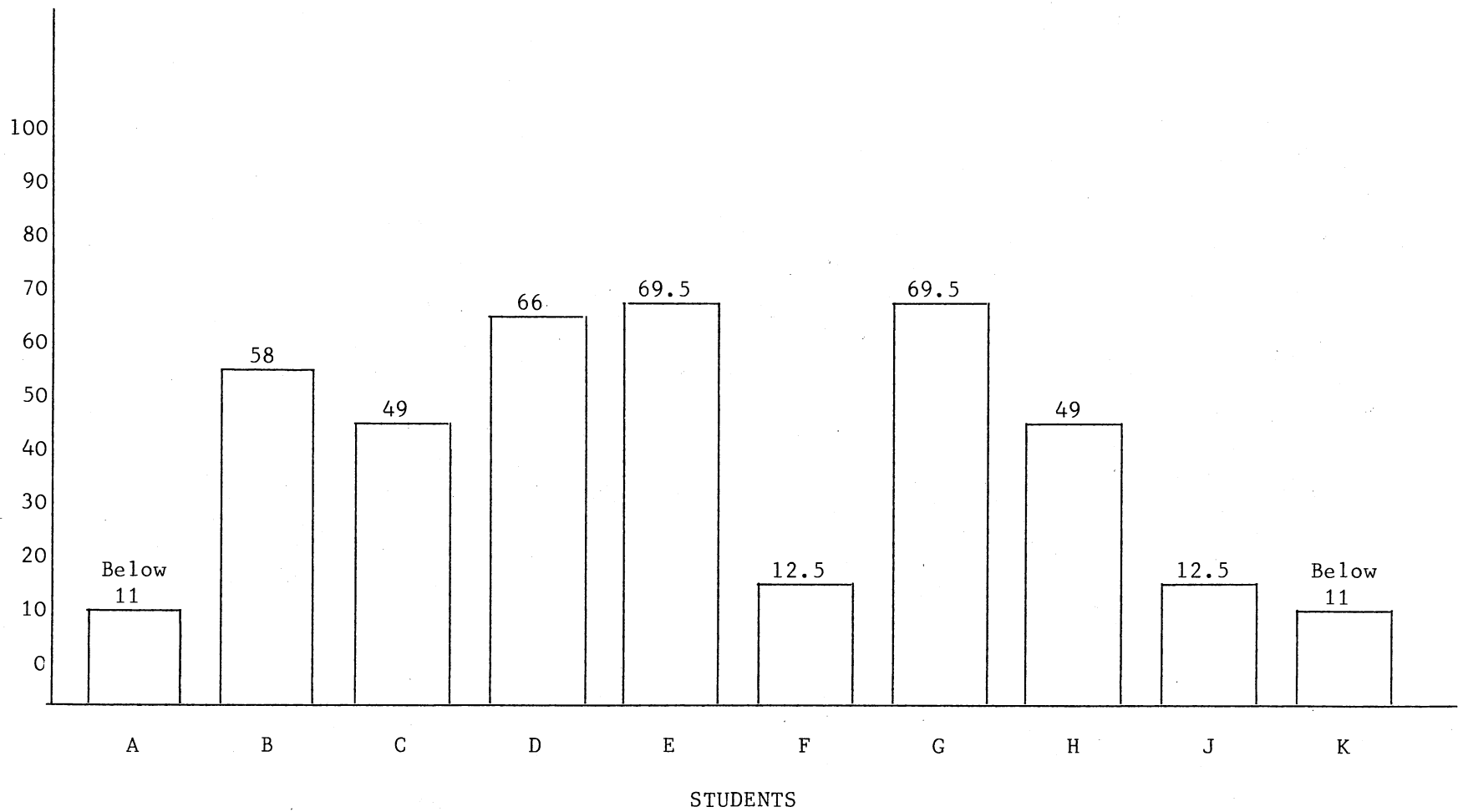


Figure 2. Comparison of Student's Individual UAP Score to the National UAP Percentile Norms for 1976-1978 Seniors

using each variable as the criterion variable. The multiple-correlation coefficient between the criterion variable and the two predictor variables gave an indication of the degree to which the predictors, taken together, actually predict the criterion variable (Bruning and Kintz, 1977). The results of these tests are presented in Table V.

TABLE V

SUMMARY OF THE RELATIONSHIP BETWEEN THE THREE SELECTED VARIABLES  
AS CALCULATED BY MULTIPLE CORRELATION AND F TESTS

	Multiple Correlation	F	Probability
$R_{\text{GPA} \cdot \text{UAP}, \text{CERT}}$	.7226	3.8228	p = .06
$R_{\text{UAP} \cdot \text{GPA}, \text{CERT}}$	.7006	3.3755	p = .09
$R_{\text{CERT} \cdot \text{GPA}, \text{UAP}}$	.3105	.3734	

The results of the tests indicated the following relationships:

1. given a student's UAP Examination and State of Oklahoma Certification Examination scores, the student's GPA could be predicted with 72 per cent accuracy;
2. given a student's State of Oklahoma Certification Examination score and GPA, the student's UAP Examination score could be predicted with 70 per cent accuracy;
3. given the student's UAP Examination score and GPA, the

student's State of Oklahoma Certification Examination score could be predicted with 31 per cent accuracy.

The State of Oklahoma Certification score showed very low correlation to the UAP Examination score and the student's GPA. The null hypothesis was not rejected based on the data at the .05 level. Hypothesis one was not shown significant at the .05 level. The results of the multiple correlation tests with the GPA or UAP being the criterion variable yielded a very high R. These results were not significant due to the small sample size that was used and due to the very low (.1889) Pearson product-moment correlation coefficient between the UAP and the CERT scores.

Considering the small sample size, the multiple correlation of GPA given UAP and CERT (.7226) and the multiple correlation of UAP given GPA and CERT (.7006) must be considered as high positive relationships. If the predictors were mutually exclusive, the correlations would have been significant. However, the small correlation between UAP and CERT indicates they are not mutually exclusive, but also are not good predictors of each other.

## CHAPTER V

### SUMMARY

The purpose of this study was to determine the statistical correlations that exist among a student's major-field grade-point average, Undergraduate Assessment Program Examination score, and State of Oklahoma Certification score.

The students involved in this study were assigned code letters because the study was not concerned with the students individually, but with the correlation of their scores and grade-point averages. The research variables of the ten Oklahoma State University students were statistically tested by use of the Pearson product-moment correlation, or a multiple correlation and a F-ratio test. The significance level of .05 was established for each of the statistical tests as the level of confidence for rejection or non-rejection of the hypotheses.

### Conclusions

From the results of this study the following conclusions relative to the hypotheses under study were made:

1. A statistically significant correlation was not shown between the UAP Examination score and the State of Oklahoma Certification Examination score.

Hypothesis four was rejected as there was not a statistically significant correlation shown between the two research variables when



tested using the Pearson product-moment correlation.

2. A statistically significant correlation was not shown between the student's major field grade-point average and the State of Oklahoma Certification Examination score.

Hypothesis three was rejected as there was not a statistically significant correlation shown between the two research variables when tested using the Pearson product-moment correlation.

- $\chi^2$ 3. A statistically significant correlation was shown between the student's major field grade-point average and the UAP Examination score.

Hypothesis two was not rejected as there was a statistically significant correlation shown between the two research variables when tested using the Pearson product-moment correlation.

4. A statistically significant correlation was not shown between the student's major field grade-point average, UAP Examination score, and State of Oklahoma Certification Examination score.

Hypothesis one was rejected as there was not a statistically significant correlation shown between the three research variables when tested using the multiple correlation and F-ratio tests.

The major emphasis of the study was placed on the testing of hypothesis one. Although the tests did not prove a statistically significant correlation between the three research variables, further examination of the results was required.

The multiple correlation tests yielded a high R when the student's GPA or the UAP Examination score was used as the criterion variable. The small population size and the small correlation (.1889) between the UAP Examination score and the State of Oklahoma Certification Examination

score variables contributed largely to the rejection of hypothesis one.

The criterion variable, GPA, was shown to be statistically significant at the .06 level of confidence. The criterion variable, UAP Examination score, was shown to be statistically significant at the .09 level of confidence.

The UAP Examination and the State of Oklahoma Certification Examination were proven to have a very small correlation (.1889). The UAP Examination is a valid and reliable examination formulated and administered by the Educational Testing Service. The State of Oklahoma Certification Examination is a newly formulated test that has been validated by use of experts. After completion of this study, some questions may be raised concerning the validity and reliability of the State of Oklahoma Certification Examination.

#### Recommendations

In reviewing the methods, procedures and results of this study, the following recommendations are in order:

1. A larger sample size is needed in order to increase the degrees of freedom.
2. The major field GPA and State of Oklahoma Certification Examination scores of the current Oklahoma State University physical education majors should be tested using the Pearson product-moment correlation in order to prove the consistency of the correlation.
3. Students from several Oklahoma institutions of higher education should be included in the study, so that the results of the study could be applied to all physical education majors in the state of Oklahoma.

4. Taking into consideration the expense involved, a revision of the State of Oklahoma Certification Examination should be studied.
5. A passing grade on the State of Oklahoma Certification Examination should not be the major requirement for teaching certification.

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## APPENDIXES

TABLE VI  
 PHYSICAL EDUCATION OF THE UP FIELD TEST AND GRE  
 ADVANCED TESTS - PERCENTILE RANKS

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Total Sample	Scaled Score	
99	560	
98	540	
97	520	
94	500	
90	480	
86	460	
80	440	
73	420	
66	400	
58	380	
49	360	
42	340	
34	320	
27	300	
22	280	
17	260	
14	240	
11	220	
1682	236	Number of Students
353	320	Mean
92	91	Standard Deviation
177	35	Number of Institutions

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Source: Educational Testing Service, 1978.

VITA<sup>2</sup>

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Master of Science

Thesis: A COMPARATIVE STUDY OF SCORES ON THE STATE OF OKLAHOMA CERTIFICATION EXAMINATION, THE UNDERGRADUATE ASSESSMENT PROGRAM EXAMINATION, AND THE MAJOR FIELD GRADE-POINT AVERAGE OF PHYSICAL EDUCATION MAJORS AT OKLAHOMA STATE UNIVERSITY

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