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PERFORMANCE-ORIENTED COMPETENCIES IN THE PHYSIOLOGY OF
EXERCISE, TESTS AND MEASUREMENTS AND ORGANIZATION AND
ADMINISTRATION FOR THE PROFESSIONAL PREPARATION OF THOSE
PLANNING TO TEACH PHYSICAL EDUCATION AT THE SECONDARY LEVEL

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Glen Emery

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ABSTRACT

PERFORMANCE-ORIENTED COMPETENCIES IN THE PHYSIOLOGY OF
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The critical information needed to be considered minimally competent in the core areas of physiology of exercise, tests and measurements, and organization and administration was identified and written into a series of questions phrased in operational terms. These groups of questions were then examined by 29 scholars teaching these core areas at each of the nine state universities in Tennessee and by 40 graduates from these institutions currently teaching physical education at the secondary level. The responses were statistically analyzed using the F ratio and Chi Square techniques. In the core area of physiology of exercise, 20 questions were agreed upon by all evaluators to be essential for minimum competency at the .01 level of significance. In the area of tests and measurements, 15 questions were presented; 13 of them were agreed

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upon to be essential for competency at the .01 level of significance. In organization and administration, 10 of the 15 questions were considered essential at the .01 level, and 2 were just below the .05 level.

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CHAPTER ONE

Introduction

Improving the professional preparation of those planning to teach physical education at the secondary level is a continual objective of the university, as well as a concern of the community, state and nation. There are several strategies available to promote the furtherance of this goal. Three such possibilities are: (1) to enrich the quality of the teacher; (2) to raise the quality of the students admitted to the program; and (3) to strengthen the curriculum offered. This paper will attempt to focus on the performance-oriented curricula of the professional preparation programs for teachers of physical education at the secondary level. Although these objectives have not been field tested in actual program operation, they have been reviewed by professional educators and graduates teaching in the field for at least three years.

The information developed is expected to help provide guidelines for the Physical Education Department's use in: (a) recommending performance goals for instructors, (b) establishing a syllabus for student use, (c) developing departmental examinations which could be administered by a departmental testing staff or by the individual instructor,

and/or (d) using criteria for extra-departmental exams which could be administered by a university-level examining committee.

Need for Study

Since the inception of professional preparation for teachers of physical education at Dio Lewis' Normal Institute for Physical Education in Boston in July, 1861, there have been continual attempts to improve the quality of secondary physical education teachers through various surveys, accreditation plans, research projects, studies, and national conferences.

In 1971 a national committee formed by the Educational Testing Service at Princeton, New Jersey, was comprised of the following persons: Professors Katherine L. Ley, Betty Everett, Charles Henry, Ralph H. Johnson, and William Kastrinos. This committee recommended the following seven core areas for a curriculum designed to prepare competent physical education teachers: history and philosophy of physical education; evaluation techniques; administration; curriculum and methods of teaching; scientific foundations relating to physical education such as anatomy, physiology, kinesiology, and exercise physiology; activities such as team and individual sports; and ethical and professional

responsibilities.¹ Identification of these core areas was an active step towards achieving effective professional preparation. The next step was determining the critical knowledge, within each of the core areas, necessary for a physical education teacher to perform competently at the secondary level.

Statement of the Problem

Recommendations of criteria necessary for the development of competency for secondary level physical education teachers have been consistently vague throughout the years. Therefore, the purpose of this study has been to be specific in identifying the critical information needed for minimum competency at the secondary level in the selected core areas including physiology of exercise, tests and measurements, and organization and administration. Additionally, it has been hoped that the information presented in this study will assist in formulating standards for professional preparation in the Tennessee regional institutions.

Limitations of the Study

This research was limited to three of the seven core areas cited above and consisted of developing competencies

¹Educational Testing Service, The Undergraduate Program for Counseling and Evaluation (Princeton, New Jersey, 1971), pp. 4-9.

needed by physical education majors planning to teach at the secondary level. Core areas included were: (1) physiology of exercise, (2) tests and measurements as related to physical education, and (3) organization and administration.

These three areas were arbitrarily chosen in order to limit the scope of this paper with no particular bias for or against the four core areas not chosen.

Assumptions

There are certain suppositions which, if accepted, strengthen the position for the discussion of the problem. These assumptions are:

1. Professional preparation is necessary and required of all individuals emerging as physical education instructors.
2. Agreement on standards for professional preparation programs is prerequisite to accepting responsibilities for training physical educators.
3. Competence in the areas of physiology of exercise, tests and measurements, and organization and administration is a necessary requisite for physical educators.
4. Awareness of the standards is necessary in order for students to study, be tested, and be certified as competent physical educators.

Definitions of Terms

Within this paper are several terms which describe and categorize data collected. These terms are defined as presented in the scope of this discussion.

Exercise physiology--the study of the functions of the organs, tissues, and cells as they pertain to bodily exertion for the sake of developing and maintaining physical fitness and specific or all-around competence in physical power or skill.²

Organization--the structuring of people to work together toward specified goals, while administration (the term used for management in public institutions) involves planning, coordinating, directing, and evaluating activities and efforts of the group toward common interests.³

Physical education--the discipline of human movement to include growth development and the application of the behavioral, biological, and physical sciences to support the understanding and consequences of movement. Sport, dance,

²Laurene E. Morehouse and Augustus T. Miller, Jr., Physiology of Exercise, 7th ed. (St. Louis: C. V. Mosby Company, 1976), pp. ix-x.

³J. D. Dunn, Elvis Stephens, and J. Roland Kelley, Management Essentials: Resource (New York: McGraw-Hill Book Company, 1973), p. 22.

play, and games are mediums for teaching and studying movement for daily living.⁴

Tests and measurements--the processes for collecting information to determine the degree to which an individual or group possesses a certain defined characteristic. Evaluations describe judgments of the value of the measurements to facilitate rational decisions with respect to diagnosis, prediction, motivation, and degree of achievement.⁵

Undergraduate professional preparation--the process of providing a background of general knowledge and specific skills unique to a student's chosen field of study to provide a more effective direction of learning experiences.⁶

Background for the Study

For as long as one can remember, there has been confusion as to what the standards and criteria were for competent performance in teaching physical education.

⁴Professional Preparation in Health Education, Physical Education, and Recreation Education, a report of a national conference (Washington, D.C.: American Association for Health, Physical Education, and Recreation, 1962), p. 23.

⁵Ted A. Baumgartner and Andrew S. Jackson, Measurement for Evaluation in Physical Education, 2nd ed. (Dubuque, Iowa: Wm. C. Brown Company, 1982), pp. 2-8.

⁶Professional Preparation in Health Education, Physical Education, and Recreation Education, pp. 24-25.

In fact, the very point of competent performance was nearly always arbitrary and most of the time vague. Standards depended upon the competence of the teacher or leader himself, in his ability to define the standards, and in his ability to fairly evaluate the results of performance. Competency as judged by peers was frequently based on their perception of social status. It may have been ascertained by considering personal dress, economic status, and social awareness. Judged competency often varied among members of the same group. Perceived competency also varied with respect to the background of the judge.

Fixed standards for achievement are not available in all areas. Some professional groups such as physicians, dentists, and architects have recognized the need and have taken steps to gain consistent measurement and evaluation of their members. Physical education, unfortunately, is not among them.

It is the hope that this research will contribute to the establishment of meaningful standards which can be applied and used in an area broader than that obtained in an individual's classroom.

CHAPTER TWO

Review of Related Literature

The overall formal movement toward accountability for undergraduate professional preparation of physical education majors began in May, 1948, when a national conference was held at Jackson's Mill in Weston, West Virginia. At this conference, which was the first of its kind in physical education in the United States, a steering committee of prominent physical educators met for the purpose of improving the standards representing competence in physical education, health education, and recreation. One of the stated objectives of this historic conference was to develop standards and programs for individual institutions to use as guides for the preparation of their own graduates to engage in field work and service to the public.¹

One of the results which emerged during the first few days of this conference was the listing of certain personal qualifications that physical education teachers should

¹The National Conference on Undergraduate Professional Preparation in Health Education, Physical Education and Recreation (Washington, D.C.: American Association for Health, Physical Education and Recreation, 1948), p. 1. (Hereafter cited as National Conference, 1948).

possess, such as "above average health status, above average mental ability, and a personal concern for the welfare of all people."² Following this action the physical education conferees recommended a number of proficiencies deemed necessary to assure some standard of competency for physical educators such as:

proficiency in evaluating the outcome of learning experiences, skill in the adjustment of learning experiences to the nature and needs of people, and effectiveness in working with others, including pupils, colleagues, parents, and community.³

At this point, after much discussion, the committee agreed that

the exact amount of time required to produce the competent teacher and cultured citizen will vary with the individuals and institutions . . . and while a general curriculum plan is essential, competency in achieving the objectives of the curriculum should be the criterion for graduation rather than a set time or course requirement.⁴

The basic questions which then arose were: How did one arrive at competency in achieving curriculum objectives? Could the curriculum objectives be identified? What was competency? How would it be measured?

At the conclusion of the 12-day Jackson's Mill Conference the answer to the first question was

²National Conference, 1948, p. 7.

³Ibid.

⁴Ibid., p. 18.

developed in the form of a detailed compilation of 95 statements. Some of these were:

1. Professional preparation in physical education should be concerned with the student's ability to use scientific information.
2. Experiences should be provided for students to acquire a wide variety of personal skills in physical education activities.
3. Students should acquire the knowledge of and skill in using the tools of objective measurement in the various aspects of the program.
4. The physical educator should have knowledge of legal liabilities and insurance coverage relating to the physical education and athletic programs.
5. Provision should be made for the professional student to develop competence in first aid and in proper athletic conditioning and training.
6. The effective physical education teacher must realize that laboratory and field experiences should be integrated with other phases of the professional program.
7. The prospective teacher should have above average motor ability in order that he may develop the necessary competencies in physical education activities.⁵

From this sampling of objectives it should be noted that the essential identification of objectives was done very well. However, this very important first step was, in fact, only the beginning of realizing competency. The critical issues of competency and how it could be measured remained to be resolved. Further work was necessary.

⁵Ibid., pp. 19-25.

Consequently, in April, 1960, at Miami Beach, Florida, during the 75th anniversary convention of the American Association for Health, Physical Education and Recreation, preparations were begun for another national professional preparation conference to be held in January, 1962, at the National Education Association Building in Washington, D.C. At this conference 27 national associations with 140 participants devoted themselves to laying out some broad standards and general principles for overall professional preparation, defining competencies and determining some guidelines for implementing their recommendations.⁶

As the conferees reflected on the latest changes in teacher education they made certain broad recommendations. Some of these were:

1. Fifty percent of the four-year undergraduate programs should consist of the general education requirement.
2. Five years of professional preparation were considered essential for basic preparation.
3. The profession itself should determine the nature of professional education.⁷

Some conferees who met specifically to study the main elements in the area of physical education as opposed to the health education and recreation education areas

⁶Professional Preparation in Health Education, Physical Education, and Recreation Education, a report of a national conference (Washington, D.C.: American Association for Health, Physical Education and Recreation, 1962), p. 4.

⁷Ibid., p. 5.

produced a comprehensive listing of 252 policies covering every facet of the profession from student recruitment and faculty selection to basic facilities and instructional materials. Curricular areas relevant to physical education were presented with general assessments as to their importance for developing student competencies.

It seemed that this conference primarily refined the curriculum objectives formulated by the 1948 conference. The 1962 conference presented a broader and more comprehensive study, to include a suggested five-year program for undergraduate preparation and some guidelines for a Master's degree. The end result made another significant step toward achieving competency by clarifying and making more detailed and explicit the formulation of curriculum objectives.⁸

The essence of competency in physical education was alluded to. If the institution offered a comprehensive curriculum with universal elements and if the above-average student pursued the appropriate and logically required courses, the result would or should be a modicum of competency. Certainly one would expect a greater degree of competency by following rather than not following this procedure. Nevertheless, the definition of competency, either overall or specifically or how it would be measured, was still unclear.

⁸Ibid., pp. 53-82.

Hence, in the fall of 1967, a Professional Preparation Panel, created by the 1962 conference recommended extensive revisions in the guidelines which had been established in the 1962 national convention. Another national conference subsequently emerged in 1972 in New Orleans, Louisiana. The conferees were keenly aware of the ever-changing issues and needs in education. One of the popular, current themes of the day was the demand by taxpayers and parents for accountability for the products of their educational institutions.⁹ This imperious request meant that the people sending their sons and daughters to the university were intensely interested in whether they were getting their money's worth--could the students meet the demands of society? In the past, excellent curriculum guidelines were developed to assist teachers in directing their efforts. At this 1972 conference it was clearly understood that performance objectives for the students had to be defined. If the performance objectives could in addition be operationally defined, that is, defined so that they can be measured, then a set of standards could be established by which student achievement could be evaluated. From this point a definition of competency could ultimately be derived.

⁹Professional Preparation in Dance, Physical Education, Recreation Education, Safety Education and School Health Education (Washington, D.C.: American Association for Health, Physical Education and Recreation, 1974), p. ix.

The 1972 conferees also envisioned a departure from previously prescribed programs which fit the student into a prepared mold, to programs featuring independent study and self-pacing preparation for proficiency exams and certification.¹⁰ As a result of the efforts of a task force of over 400 persons at this conference, comprehensive guidelines for professional preparation were developed. Competencies relating to every area of physical movement were suggested--from philosophy and history to curriculum planning and research foundations. Some competencies in the areas for this study, administration and physical science, were presented. Most, however, were too general for operational testing.¹¹

Following the Herculean actions of the 1972 New Orleans task force in developing guidelines for professional preparation in physical education, a national conference entitled "Progress Through Diversity" was held in Chicago during November of 1980. Further strengthening of broad goals was effected but, again, specific performance-oriented objectives were not developed.

In an effort to determine whether there were any articles or works pertaining to the development of

¹⁰Ibid., p. 21.

¹¹Ibid., pp. 23-65.

competencies in these core areas, every issue of the following journals to date was examined:

The Australian Council for Health, Physical Education and Recreation National Journal, 1983-1985

Australian Journal for Health, Physical Education and Recreation, 1975-1983

Canadian Association for Health, Physical Education, and Recreation Journal, 1972-1985

Journal of Health, Physical Education and Recreation, 1930-1974

Journal of Physical Education, 1969-1980

Journal of Physical Education and Recreation, 1975-1981

Journal of Physical Education, Recreation and Dance, 1981-1986

Physical Educator, 1942-1986

Quest, 1963-1985

Research Quarterly, 1930-1979

Research Quarterly for Exercise and Sport, 1980-1985.

There were no articles that were found dealing with professional preparation in the defined area. There were numerous studies that dealt with professional preparation in one vein or another, but none treated nor alluded to the area of this paper.

CHAPTER THREE

Methods and Procedures

Areas for Study Selected

The preliminary inquiry into the topic of competency in teaching physical education revealed that the discipline of physical education was very broad in scope because of the variety of programs included within its sphere. In an effort to obtain a clearer perspective on this wide spectrum of subject matter, a study was used which was conducted in 1971 by a committee formed by the Educational Testing Service at Princeton, New Jersey. This committee organized the field of physical education into a substantive curriculum which was divided into seven basic areas: history and philosophy of physical education; evaluation techniques; administration; curriculum and methods of teaching; scientific foundations relating to physical education such as anatomy, physiology, kinesiology, and exercise physiology; activities such as team and individual sports; and ethical and professional responsibilities.

As a limitation for the scope of the research for this paper, three of the seven areas were arbitrarily chosen; the areas selected were physiology of exercise, tests and measurements, and organization and administration.

After narrowing the extent of the area involved for developing competencies, the journals as shown previously, from 1972 (the date of the last national conference for professional preparation to the present) were thoroughly examined in search of ideas and studies relating to competency in the three areas. Nothing was found pertaining to competencies or the development of competencies. At this point it was determined that a basic foundation of competencies should be constructed, since it appeared from the journals that there were no lists or sets of competencies available.

Sampling

An assumption was made that at each university and college throughout the nation where physical education teacher education programs were offered, some part or all of these three areas were included in order to prepare students to be professionally competent. A further assumption offered was that standards for competency in the three chosen areas were as varied as each instructor and each institution. It was deemed prudent to use a sampling of the institutions for researching and investigating the sources used for teaching the three areas of concern in order to form a nucleus around which a uniform set of competencies could be developed.

The nine state universities in Tennessee were chosen as the sample. These nine universities were: Austin Peay State University at Clarksville, East Tennessee State University at Johnson City, Memphis State University at Memphis, Middle Tennessee State University at Murfreesboro, Tennessee State University at Nashville, Tennessee Technological University at Cookeville, University of Tennessee at Chattanooga, University of Tennessee at Knoxville, and University of Tennessee at Martin.

Developing the Competencies

After defining the boundaries for the research, the process was started for determining whether there were fundamental facts and ideas that comprised the basic foundation of each core area. To do this, the texts used by each of the professors teaching these subjects at the nine universities in the sample were examined. A letter (Appendix A) was sent to the chairman of the Physical Education Department of each of the nine universities requesting a listing of the texts used to teach the three areas being considered.

Replies were received from all nine universities. The various texts used by the universities are shown in Tables 1, 2, and 3. These texts were perused to determine the main themes presented by the different authors. As the central ideas were analyzed, there appeared a pattern wherein certain topics were discussed by each author. The

Table 1
Physiology of Exercise Texts Used by School

deVries: <u>Physiology of Exercise</u> , Second Edition	Middle Tennessee State University Memphis State University
Lamb: <u>Physiology of Exercise</u>	Tennessee State University Austin Peay University
Mathews and Fox: <u>The Physiological Basis of Physical Education and Athletics</u> , Second Edition	University of Tennessee at Martin University of Tennessee at Chattanooga University of Tennessee at Knoxville
No text	Tennessee Technological University
Straus: <u>Sports Medicine and Physiology</u>	East Tennessee State University

Table 2

Tests and Measurements Texts Used by School

Barrow and McGee: <u>A Practical Approach to Measurement in Physical Education, Third Edition</u>	University of Tennessee at Martin Memphis State University East Tennessee State University Tennessee Technological University
Baumgartner and Jackson: <u>Measurement for Evaluation in Physical Education</u>	University of Tennessee at Chattanooga
Johnson and Nelson: <u>Practical Measurements for Evaluation in Physical Education, Third Edition</u>	Middle Tennessee State University Austin Peay University
Kirkendall, Gruber, and Johnson: <u>Measurement and Evaluation for Physical Educators</u>	Tennessee State University
None required	University of Tennessee at Knoxville

Table 3

Organization and Administration
Texts Used by School

Bucher: <u>Administration of School Health and Physical Education Programs</u> , Seventh Edition	Tennessee State University University of Tennessee at Chattanooga
Frost and Marshall: <u>Administration of Physical Education and Athletics</u>	University of Tennessee at Martin
Voltmer, et al.: <u>The Organization and Administration of Physical Education</u> , Fifth Edition	Middle Tennessee State University East Tennessee State University
Resick, et al.: <u>Modern Administrative Practices in Physical Education</u> , Second Edition	Memphis State University Austin Peay University
No text required	University of Tennessee at Knoxville Tennessee Technological University

identification of these common ideas was considered a major step in the formulation of acceptable competencies at the various institutions. It could be assumed that one university would naturally question why the competencies of another institution should be accepted. But if it could be shown that the competencies selected were in fact already being used at their school, the competencies should then be more readily accepted. The common themes gleaned from the texts used by the schools were formed into objective questions in the three core areas of physiology of exercise, tests and measurements, and organization and administration. They are shown in Appendixes B, C, and D. The use of the objective question format would facilitate responses capable of being evaluated for validity and reliability.

Obtaining Professional Opinions

With a cover letter (Appendix E), the questions for each core area were sent to each of the professors who had taught that particular core area at least three times at each of the nine universities. There were 29 scholars, shown in Tables 4, 5, and 6, who were asked to examine the questions and to indicate for each question whether they agreed or disagreed with the material formulated by each question as being necessary knowledge for physical education teachers at the secondary level to be fundamentally competent in that area.

Table 4

Names of the Evaluators Who Responded by
University for Physiology of Exercise

University	Scholar	Graduate
Middle Tennessee State	Dr. Powell McClellan Dr. Guy Penny	Kerry Thompson Robert James Thomas Hopkins Gary Whaley
East Tennessee State	Dr. John Anderson	Carl Hembree
Austin Peay	Dr. Luke Thomas	Cindy Alexander
University of Tennessee at Chattanooga	Dr. William Norris	Bobby Hale Ann Shelton
Tennessee Technological	Dr. LeBron Bell	Gene Earl
University of Tennessee at Martin	Dr. J. A. Richardson	Tony Wright Jim Jenkins

Table 4 (Continued)

University	Scholar	Graduate
Tennessee State	Dr. Harry Beaman	Janet Parker
Memphis State	Dr. Charles Schroeder	Jane Holder
University of Tennessee at Knoxville	Dr. Ed Howley	

Table 5

Names of the Evaluators Who Responded by
University for Tests and Measurements

University	Scholar	Graduate
University of Tennessee at Knoxville	Dr. B. Don Franks	Daniel Parris Gwendolyn Harrell Dawn Kelly
East Tennessee State	Dr. Judy Johnson	Don Mathews
Middle Tennessee State	Dr. Guy Penny	
University of Tennessee at Martin	Dr. Gracie J. Purvis	Robert Gunn
Memphis State	Dr. Darrell Crase	Virginia Vernado John Roelofs
Austin Peay	Dr. Luke E. Thomas	

Table 5 (Continued)

University	Scholar	Graduate
Tennessee Technological	Dr. Robert Fort	Helen Jennings
University of Tennessee at Chattanooga	Dr. Leroy Fanning	Catherine Neely Patty Lawe
Tennessee State	Dr. Audrey Lewis	Caroline Shakel- ton Patsy Turner

Table 6

Names of the Evaluators Who Responded by
University for Organization and
Administration

University	Scholar	Graduate
Tennessee State	Dr. Fred Sawyer	
University of Tennessee at Knoxville	Dr. Patsy C. Boroviak Dr. Nancy Lay	Sharon Brown Rosemary McMahon Christie Irwin Donna Donelly
East Tennessee State	Dr. Janice Shelton	Jan Stooksberry Joan Walters
Middle Tennessee State	Dr. Ralph Ballou	
University of Tennessee at Martin	Dr. Carol Ann Leaf	Karen Rawls David Byars Donald High

Table 6 (Continued)

University	Scholar	Graduate
Memphis State	Ms. Jane Hooker	Barbara Whitaker Janet Daleke Diane Coleman
Austin Peay	Dr. George Fisher	
Tennessee Technological	Dr. Flavious Smith	Elaine House- holder Larry Gidcomb
University of Tennessee at Chattanooga	Dr. Robert Norred	Pam Womack

In conjunction with the views of the scholars, the same sets of questions were randomly sent to a small sample of the very population for which the competencies were developed--physical education teachers at the secondary level. With a cover letter, shown in Appendix F, a list of competencies was sent to physical education teachers who had graduated from one of the nine universities and who had at least three years experience teaching physical education at the secondary level. The names and addresses were solicited from professors at the nine universities and from high school principals chosen at random throughout the state of Tennessee. Shown in Tables 4, 5, and 6 is a listing of the 40 participants and the various institutions from which they graduated and the area to which they responded.

In summary, the premise that competency in teaching physical education had to include the knowledge of certain common ideas and topics in each of the three core areas was advanced by identifying the central themes, formulating these themes into objective questions, and evaluating these questions as to their applicability for inclusion as a factor for determining overall competency. In the following chapter the data received from the 29 scholars and 40 secondary level physical education teachers are shown and analyzed.

CHAPTER FOUR

Data Analyses and Discussion

The competencies which were developed from the various texts used at the nine universities in the sample were sent to 29 scholars and 40 physical education teachers in the field for the purpose of obtaining their judgments as to whether each competency as presented should be an essential part of the basic knowledge needed by physical education graduates for teaching effectively at the secondary level. The competencies were presented in a column with a space to the right for making a check mark in a square indicating "yes" or "no" as to whether the competency was essential. "Essential" was defined at the beginning of the competency list as necessary to possess the basic knowledge as a vital part to competent teaching of physical education at the secondary level.

As shown previously in Tables 4, 5, and 6, the physiology of exercise competencies were sent to 10 scholars and 13 teachers; the tests and measurements questions were sent to nine scholars and 12 teachers, and the organization and administration competencies were sent to 10 scholars and 15 teachers. All of the 69 sets of competencies which were

sent out were returned. The "yes" and "no" check marks were counted for each competency. In some cases a few of the spaces were not marked. No effort was made to ascertain the reason for leaving the blanks. Tables 7, 8, and 9 show a compilation of the individual responses for each of the competencies evaluated by the 29 scholars and the 40 teachers in the field.

The data needed to be analyzed in order to form some conclusions about their merits. It was noted that there were two sets of measurements (from scholars and from teachers), and that each was obtained under its own set of circumstances. It was necessary, therefore, to determine whether there was or was not a significant difference between the observed responses of the two sample populations. R. A. Fisher's test of analysis of variance, or F test, was used to ascertain whether the sets of data were sufficiently different from one another to reject the null hypothesis. The null hypothesis stated, in this case, that there were no significant differences between the responses of the two groups at the .05 level.

In Table 10, the computed F ratios obtained in this analysis in the three core areas are shown.¹ The F ratios did not exceed the values necessary to reject the null

¹Barry L. Johnson and Jack K. Nelson, Practical Measurements for Evaluation in Physical Education, 3rd ed. (Minneapolis: Burgess Publishing Company, 1979), pp. 34-36.

Table 7
 Physiology of Exercise--Individual Returns of Each of the
 Competencies as Evaluated by Scholars and Graduates
 Who Are Teaching Physical Education at
 the Secondary Level

Competency Item Number	X Scholars N = 10			Y Graduates N = 13			X + Y Combined N = 23		
	Essential		Percent Yes vs No	Essential		Percent Yes vs No	Essential		Percent Yes vs No
	Yes	No		Yes	No		Yes	No	
	Yes	No	Yes vs No	Yes	No	Yes vs No	Yes	No	Yes vs No
1	8	2	80%	11	2	85%	19	4	83%
2	10		100%	12	1	92%	22	1	96%
3	10		100%	13		100%	23		100%
4	9	1	90%	11	2	85%	20	3	87%
5	8	2	80%	13		100%	21	2	91%
6	10		100%	13		100%	23		100%
7	9		100%	12	1	92%	12	1	95%
8	9	1	90%	13		100%	22	1	96%

Table 7 (Continued)

Competency Item Number	X Scholars N = 10			Y Graduates N = 13			X + Y Combined N = 23		
	Essential Yes	No	Percent Yes vs No	Essential Yes	No	Percent Yes vs No	Essential Yes	No	Percent Yes vs No
9	9		100%	12	1	92%	21	1	95%
10	8	1	89%	11	2	85%	19	3	86%
11	9		100%	11	2	85%	20	2	91%
12	9		100%	11	2	85%	20	2	91%
13	8	1	89%	12	1	92%	20	2	91%
14	10		100%	13		100%	23		100%
15	9	1	90%	11	2	85%	20	3	87%
16	10		100%	10	3	77%	20	3	87%
17	8	1	89%	12	1	92%	20	2	91%
18	9	1	90%	12		100%	21	1	95%

Table 7 (Continued)

Competency Item Number	X Scholars N = 10			Y Graduates N = 13			X + Y Combined N = 23		
	Essential		Percent	Essential		Percent	Essential		Percent
	Yes	No	Yes vs No	Yes	No	Yes vs No	Yes	No	Yes vs No
19	10		100%	10	3	77%	20	3	87%
20	9	1	90%	12	1	92%	21	2	91%

 $\Sigma = 1877$ $\Sigma = 1816$

Table 8

Tests and Measurements--Individual Returns of Each of the
Competencies as Evaluated by Scholars and Graduates
Who Are Teaching Physical Education at
the Secondary Level

Competency Item Number	X			Y			X + Y		
	Scholars		N = 9	Graduates		N = 12	Combined		N = 21
	Essential		Percent Yes vs No	Essential		Percent Yes vs No	Essential		Percent Yes vs No
	Yes	No		Yes	No		Yes	No	
1	7		100%	11	1	92%	18	1	95%
2	7		100%	12		100%	19		100%
3	5	1	83%	11	1	92%	16	2	89%
4	2	5	28%	5	7	42%	7	12	37%
5	4	2	67%	11		100%	15	2	88%
6	5	1	83%	11		100%	16	1	94%
7	7		100%	10	1	91%	17	1	94%
8	8		100%	12		100%	20		100%

Table 8 (Continued)

Competency Item Number	X Scholars N = 9			Y Graduates N = 12			X + Y Combined N = 21		
	Essential		Percent	Essential		Percent	Essential		Percent
	Yes	No	Yes vs No	Yes	No	Yes vs No	Yes	No	Yes vs No
9	7	1	87%	11	1	92%	18	2	90%
10	5	3	62%	9	3	75%	14	6	70%
11	9		100%	11	1	92%	20	1	95%
12	5	2	71%	11	1	92%	16	3	84%
13	9		100%	20	2	83%	19	2	90%
14	9		100%	12		100%	21		100%
15	9		100%	11	1	92%	20	1	95%

 $\Sigma = 1281$ $\Sigma = 1343$

Table 9

Organization and Administration--Individual Returns of Each of
the Competencies as Evaluated by Scholars and Graduates
Who are Teaching Physical Education at
the Secondary Level

Competency Item Number	X Scholars N = 10			Y Graduates N = 15			X + Y Combined N = 25		
	Essential		Percent Yes vs No	Essential		Percent Yes vs No	Essential		Percent Yes vs No
	Yes	No		Yes	No		Yes	No	
	Yes	No	Yes vs No	Yes	No	Yes vs No	Yes	No	Yes vs No
1	9	1	90%	15		100%	24	1	96%
2	6	3	67%	12	3	80%	18	6	72%
3	10		100%	12	3	80%	22	3	88%
4	8	1	89%	13	2	87%	21	3	87%
5	8	2	80%	11	4	73%	19	6	76%
6	4	6	40%	7	8	47%	11	14	44%
7	5	5	50%	8	7	53%	13	12	52%
8	6	4	60%	10	5	67%	16	9	64%

Table 9 (Continued)

Competency Item Number	X Scholars N = 10			Y Graduates N = 15			X + Y Combined N = 25		
	Essential		Percent	Essential		Percent	Essential		Percent
	Yes	No	Yes vs No	Yes	No	Yes vs No	Yes	No	Yes vs No
9	10		100%	13	2	87%	23	2	92%
10	8	2	80%	12	3	80%	20	5	80%
11	10		100%	13	2	87%	23	2	92%
12	10		100%	12	3	80%	22	2	88%
13	9	1	90%	15		100%	24	1	96%
14	7	3	70%	10	5	67%	17	8	68%
15	8	2	80%	9	6	60%	17	8	68%

$\Sigma X = 1196$

$\Sigma Y = 1148$

Table 10
 Analysis of Variance for Percentages of Agreement
 Responses for Scholars and Graduates

	Source of Variation	Sum of Squares	Degree of Freedom	Mean Square	Computed F Ratio	Ratio* at .05 Level
Physiology of Exercise	Between	93	1	93	1.75	4.10
	Within	2006	38	53		
	Total	2099	39			
Tests and Measurements	Between	127	1	127	.39	4.20
	Within	9208	28	329		
	Total	9335	29			
Organization and Administration	Between	76	1	76	.25	4.20
	Within	8421	28	301		
	Total	8497	29			

*Source: Barry L. Johnson and Jack K. Nelson, Practical Measurements for Evaluation in Physical Education, 3rd ed. (Minneapolis: Burgess Publishing Company, 1979), p. 438.

hypothesis at the .05 level of significance and, therefore, the null hypothesis was accepted. By accepting the null hypothesis, there were no significant differences between the evaluation responses of the scholars and the graduates. Any differences that did occur were due to sampling variations.

The next step in determining whether the responses received were of any virtue was to analyze the variance between percentages of agreement responses between scholars and graduates for each competency evaluated. The responses of the scholars were compared to the responses of the graduates for each competency to determine whether the differences in responses were real or due to variations in procedure from the previous one which involved total responses to the two independent sample groups. The major difference was that each individual competency was correlated to determine whether the differences in raw responses were due to sampling variations.

In Table 11 the computed F ratios obtained in this analysis are shown for all three of the core areas.² The F ratios did not exceed the values necessary to reject the null hypothesis at the .01 level of significance. Hence, the null hypothesis was not rejected. By accepting the null hypothesis, it is noted that there were no significant

²Ibid., pp. 37-39.

Table 11
 Analysis of Variance for Comparing Paired Samples of
 Percentages of Agreement Responses Between
 Scholars and Graduates

	Source of Variation	Sum of Squares	Degree of Freedom	Mean Square	Computed F Ratio	Ratio* at .05 Level
Physiology of Exercise	Rows	890	39	23		
	Between Groups	93	1	93	3.2	7.33
	Error	1116	39	29		
	Total	2099	79			
Tests and Measurements	Rows	7909	29	273		
	Between Groups	127	1	127	2.8	8.17
	Error	1299	29	45		
	Total	9335	59			
Organization and Administration	Rows	7459	29	257		
	Between Groups	76	1	76	2.3	8.18
	Error	962	29	33		
	Total	8497	59			

*Source: Barry L. Johnson and Jack K. Nelson, Practical Measurements for Evaluation in Physical Education, 3rd ed. (Minneapolis: Burgess Publishing Company, 1979), p. 439.

differences between the groups (scholars and teachers), and any differences that did occur between their individual responses were due to sampling variations.

The final analysis of the data collected involved determining the point at which the number of positive responses to each competency was significant at a very high level of assurance. The statistical procedure, known as Chi Square, was applied to obtain a solution to the problem. By using Chi Square it was to be determined whether the observed responses differed from the expected responses of a population of similar size in which the opinions were evenly divided, as 50% in favor and 50% offering a negative response. The question was: Did the observed responses differ significantly from the expected 50-50 frequency? The null hypothesis in this case was a 50-50 division of responses. In proceeding with the analysis, it was determined that a larger, more heterogeneous population would be obtained by combining the responses of the scholars and the graduates. As has been shown, the responses of these two groups correlated with a very high degree of assurance. The Chi Square for each competency is shown in Table 12. From the statistical table of Chi Square, it was noted that the Chi Squares of 3.84 and 6.63 were significant at the .05 and .01 levels, respectively.³

³J. P. Guilford, Fundamental Statistics, 2nd ed. (New York: McGraw-Hill Company, 1950).

Table 12
Chi Squares for Combined Responses for
Each Competency

Item No.	Physiology of Exercise χ^2	Tests and Measurements χ^2	Organization and Administration χ^2
1	9.78	15.21	21.16
2	19.17	19.00	6.00
3	23.00	10.89	14.44
4	12.57	-1.32	13.50
5	15.70	9.94	6.76
6	23.00	13.24	-.36
7	18.18	14.22	.04
8	19.17	20.00	1.96
9	18.18	12.80	17.64
10	11.64	3.20	9.00
11	14.73	17.19	17.64
12	14.73	8.89	14.44
13	14.73	15.21	21.16
14	23.00	21.00	3.24
15	12.57	17.19	3.24
16	12.57		
17	14.73		
18	18.18		
19	12.57		
20	15.70		

From an inspection of Table 12 it was noted that all 20 of the combined evaluations for the competencies in physiology of exercise were significant beyond the .01 level:

1. Draw a diagram and label the gross structure and connective tissue of a skeletal muscle.
2. Explain the supply of the energy needs of muscle contraction for sprinters and marathon runners by the metabolic process of the anaerobic and aerobic pathways.
3. Explain how one can delay the onset of muscle fatigue caused by lactic acid and glycogen depletion.
4. Explain the functioning of a motor unit and its relationship to (1) the "all or none" law and (2) a gradation of muscular effort.
5. Trace a neural-muscular activity involved in making a voluntary movement such as kicking a ball.
6. With concern to the transport of oxygen and carbon dioxide to and from the skeletal muscles during exercise, what are the cardiac output, stroke volume, and heart rate, and what are the results of each in response to demands of heavy exercise in trained and untrained athletes?
7. The oxygen-carbon dioxide exchange in the tissue-capillary membranes differs for trained and untrained persons. Explain why this difference happens and how the exchange occurs.

8. Explain the breathing frequency and depth adjustments which occur as a result of metabolic demands for oxygen.

9. What happens when oxygen and carbon dioxide diffusion occurs? How does training affect this process?

10. When measuring energy expenditure for a certain exercise, describe the procedures for obtaining the amount of oxygen consumption at rest, during exercise, and during recovery.

11. What are the basic tenets of any conditioning program?

12. Describe the procedures to use to effect a nutrition program for maintaining energy needs.

13. Outline the procedures which are necessary to prevent or reduce muscle soreness due to exercise workouts.

14. What procedures should be followed to prevent illness from heat during exercise?

15. When using a strength improvement program, compare the effectiveness and limitations of isometric and isotonic exercises.

16. Explain the overload principle and how it applies to both circulorespiratory and muscle endurance training.

17. Explain the difference between static and dynamic flexibility training. Describe exercises to improve flexibility at the shoulder, trunk, and knee.

18. Develop a simple set of rules which will result in good nutrition and dietary habits.

19. Explain some of the physiological effects associated with ergogenic aids.

20. When designing and administering physical training programs for women, what precautions different from those for men should one consider?

In the area of tests and measurements, 13 of the 15 combined responses to individual competencies were significant beyond the .01 level:

1. Compare the principles of knowledge testing for mastery with testing for discrimination.

2. The affective domain includes behavior, sportsmanship, social adjustment, attitudes, and values. Why would teachers measure these traits and what various ways would the information be collected?

3. How can sport skills tests be used to support the objectives of teaching physical education?

5. Agility has been found to be an important factor in predicting skill in certain sports, such as volleyball and basketball. What are the problems associated with agility testing that affect the scoring?

6. The measure of leg power appears to be useful for predicting success in football. Explain the components of power and why this relationship exists.

7. What are the relationships between anthropometric measures and physical performance?

8. Describe two tests which can be used to determine cardiovascular efficiency which are easy to administer and do not require expensive laboratory equipment.

9. What is the difference between static and dynamic muscular endurance? What is a good test for each? What is the relationship to strength testing?

11. What is flexibility? Describe a test for measuring the flexibility of the hamstring and lower back muscles.

12. Given a group of test scores, determine an index of item discrimination for each score. From the results decide what items should be retained, improved, or eliminated.

13. When given a set of skill test scores, determine the grade for each student using percentage correct or absolute standard, normal curve, and contract methods.

14. What are reliability and validity? What factors affect these test characteristics?

15. Given the formulas and an array of data, describe the purpose of each and determine each of the following:
____ percentile rank; ____ mean; ____ standard deviation;
____ Z-score; and ____ Spearman rank-order correlation.

Number four indicated the response was on a par with a random 50-50 reply:

4. When a student is tested for balance, what is observed and recorded?

Number ten was marginally below the .05 level:

10. Compare the merits and problems of isotonic and isometric strength tests.

In organization and administration, 10 of the 15 combined responses were significant beyond the .01 level:

1. Describe the criteria essential to meaningful measurement and evaluation of students in physical education.

2. Describe an efficient, all around physical education facility. Include important facets of indoor activity areas, swimming pools, and outdoor areas.

3. Discuss the factors needed to be considered when purchasing athletic equipment.

4. Describe the procedures which are essential for the proper care of equipment.

5. Discuss how interschool athletics contribute to the educational goals.

9. Develop a well-rounded, active intramural program. Take into consideration facilities, climate, and objectives of intramurals.

10. Compare the advantages and disadvantages of the round robin, elimination, and challenge tournaments. Sketch the organization of each.

11. Discuss the factors necessary for proof of negligence.

12. Present the common defenses against negligence.

13. Describe the areas of potential negligence and liability.

Two were marginally below the .05 level.

14. Prepare a \$11,000 annual budget. Include the information to formulate the budget, the items for expenditure, and revenue sources.

15. Outline a public relations program. Include the basic principles to be considered, the purposes, target audiences, and major publicity media you would use and why.

Three items, numbers six, seven, and eight, were well below the .05 level:

6. Describe the functions of the state high school athletic association.

7. Elaborate on the problems of eligibility, recruiting, and athletic awards.

8. Diagram the organization of the ideal school health program into three categories. Include at least three topics or components in each area.

To present a compact view of the preceding data, the results in percentages of agreement for combined responses of the scholars and graduates in all three areas are shown in Table 13, the grouped frequency distribution on

Table 13

Grouped Frequency Distribution of Percentages of
Agreement for Combined Responses of
Scholars and Graduates

Physiology of Exercise			
Interval	Frequency	Frequency %	Cumulative Frequency
90-100%	14	70	20
80- 89%	6	30	6
Tests and Measurements			
90-100%	10	67	15
80- 89%	3	20	5
90- 79%	1	7	2
60- 69%	0	--	1
50- 59%	0	--	1
40- 49%	0	--	1
30- 39%	1	7	1
Organization and Administration			
90-100%	4	27	15
80- 89%	4	27	11
70- 79%	2	13	7
60- 69%	3	20	5
50- 59%	1	7	2
40- 49%	1	7	1

percentages of agreement for combined responses.⁴ The intervals of 10% were randomly chosen for ease in establishing the distribution. In the area of physiology of exercise, all of the 20 competency questions were agreed to by at least 80% of the two samples. For the area of tests and measurements, 13 of the 15 competency questions were agreed to by at least 80% of the responders. One competency was agreed to by only 37% of the graduates and scholars, indicating that the competency was probably not essential, while one of the competencies was agreed to by 70%, indicating perhaps that some revision might be necessary for that item.

In the area for organization and administration, 10 of the 15 competencies were affirmatively agreed to by 72% of the sample. Two competencies had combined affirmative responses of 68%, indicating that probably these items should be reviewed for restructuring, while three competencies varied from 64% to 44%, probably indicating that these competencies were not essential.

In the next chapter data are summarized and recommendations offered with respect to the findings.

⁴Don R. Kirkendall, Joseph J. Gruber, and Robert E. Johnson, Measurement and Evaluation for Physical Educators (Dubuque, Iowa: Wm. C. Brown Company, 1980).

CHAPTER FIVE

Summary and Recommendations

Summary

The broad objective of this study was to improve the professional preparation of those planning to teach physical education at the secondary level. Specifically, the intention was to identify the critical information needed to be considered minimally competent in teaching in the core areas of physiology of exercise, tests and measurements, and organization and administration. In order to discern the fundamental facts and ideas which comprised the basic foundations of each of the core areas, the texts used to teach these core areas at each of the nine state universities in Tennessee were perused. The central themes which were thus ascertained were written into a series of questions which were phrased in operational terms. These groups of questions were then examined by 29 scholars teaching these core areas at each of the nine state universities and by 40 graduates from these institutions currently teaching physical education at the secondary level. Their evaluations consisted of their opinions as to whether the questions embodied principles and facts which were essential as a part of the basic knowledge needed for

competent teaching of physical education at the secondary level. The responses were analyzed using the F ratio and Chi Square techniques which showed that differences in the data between the sample groups at the .05 level were due to sampling variations.

In the core area of physiology of exercise, 20 questions were presented, and all 20 questions were agreed upon by all evaluators to be essential for minimum competency at the .01 level. In the area of tests and measurements, 15 questions were presented; 13 were agreed upon beyond the .01 level to be essential for competency. In organization and administration, 10 of the 15 questions were considered essential beyond the .01 level, and two questions fell just below the .05 level.

Recommendations

The recommendations, based on this study, are for the modification of the questions falling below a .01 confidence level, followed by an immediate evaluation for validity and reliability. When the reliability and validity have been established, it is hoped that the departments of the nine state universities will initiate a conference to decide how and when the standards for competency will be implemented. One would further hope that the national association might call for the standards established in Tennessee to be used nationwide. With

national standards all graduates could then reasonably be expected to perform at a certain level of excellence regardless of the school attended.

Uniform standards will be a boon to all teachers, departments and students. Students presented with a syllabus containing the principles to be mastered will have clear goals for which to study, regardless of the quality of instruction. Professors, in turn, will have uniform standards and goals, regardless of the quality of their students. Their students can be graded and guided according to a plan and an established goal rather than be evaluated according to a curve with a certain number of passing or excellent grades given based on the overall performance of the class. Certainly departments from one institution to another can communicate on common grounds for assisting each other, accepting each other's transfer students, and evaluating their overall effectiveness in accomplishing their goals of producing professionally competent teachers. Uniform standards, a goal toward which the national committees have directed their energies in the past, will establish a platform from which the quality of professionalism can be measured and improved upon. It is anticipated that this paper has helped to reduce the historical confusion as to what the standards for competency in the areas presented should be. Arbitrary and vague standards which depend on the very competency of each

professor should be eliminated. A final recommendation is that the process shown herein be used across the spectrum of all subjects as the bases for establishing competencies and national standards.

APPENDIXES

APPENDIX A
LETTER TO CHAIRMAN OF PHYSICAL
EDUCATION DEPARTMENT

Dear Dr. _____:

I am a doctoral candidate working on my dissertation under the tutelage of Dr. Glen Reeder and Dr. A. H. Solomon. I would be very appreciative to receive the following information:

Names and authors of the texts used in your undergraduate courses on:

1. Tests and Measurements
2. Organization and Administration
3. Exercise Physiology

Names of all faculty members who have taught any one of these courses at least three times.

I will be contacting these faculty on an individual basis in the near future.

Thank you,

/s/

Glen Emery

APPENDIX B
SUGGESTED COMPETENCIES IN UNDERGRADUATE
PHYSIOLOGY OF EXERCISE

Suggested Competencies in Undergraduate
Physiology of Exercise

These competencies were developed from the material presented in the various texts used to teach this course in the four-year state universities in Tennessee. It is hoped that these competencies, if used, could be objectively assessed to develop a high level of validity and reliability.

Place a check mark in the appropriate column for your evaluation of each competency. "Essential" means that a physical education graduate teacher teaching at the secondary level should possess the basic knowledge as a vital part to competent teaching.

	<u>Essential</u>	
	Yes	No
1. Draw a diagram and label the gross structure and connective tissue of a skeletal muscle.		
2. Explain the supply of the energy needs of muscle contraction for sprinters and marathon runners by the metabolic process of the anaerobic and aerobic pathways.		
3. Explain how one can delay the onset of muscle fatigue caused by lactic acid and glycogen depletion.		

Essential

	Yes	No
4. Explain the functioning of a motor unit and its relationship to (1) the "all or none" law and (2) a gradation of muscular effort.		
5. Trace a neural-muscular activity involved in making a voluntary movement such as kicking a ball.		
6. With concern to the transport of oxygen and carbon dioxide to and from the skeletal muscles during exercise, what are the cardiac output, stroke volume, and heart rate, and what are the results of each in response to demands of heavy exercise in trained and untrained athletes?		
7. The oxygen-carbon dioxide exchange in the tissue-capillary membranes differs for trained and untrained persons. Explain why this difference happens and how the exchange occurs.		
8. Explain the breathing frequency and depth adjustments which occur as a result of metabolic demands for oxygen.		

		<u>Essential</u>	
		Yes	No
9.	What happens when oxygen and carbon dioxide diffusion occurs? How does training affect this process?		
10.	When measuring energy expenditure for a certain exercise, describe the procedures for obtaining the amount of oxygen consumption at rest, during exercise, and during recovery.		
11.	What are the basic tenets of any conditioning program?		
12.	Describe the procedures to use to effect a nutrition program for maintaining energy needs.		
13.	Outline the procedures which are necessary to prevent or reduce muscle soreness due to exercise workouts.		
14.	What procedures should be followed to prevent illness from heat during exercise?		
15.	When using a strength improvement program, compare the effectiveness and limitations of isometric and isotonic exercises.		

		<u>Essential</u>	
		Yes	No
16.	Explain the overload principle and how it applies to both circulorespiratory and muscle endurance training.		
17.	Explain the difference between static and dynamic flexibility training. Describe exercises to improve flexibility at the shoulder, trunk, and knee.		
18.	Develop a simple set of rules which will result in good nutrition and dietary habits.		
19.	Explain some of the physiological effects associated with ergogenic aids.		
20.	When designing and administering physical training programs for women, what precautions different from those for men should one consider?		

APPENDIX C
SUGGESTED COMPETENCIES IN UNDERGRADUATE
TESTS AND MEASUREMENTS

Suggested Competencies in Undergraduate Tests and Measurements

These competencies were developed from the material presented in the various texts used to teach this course in the four-year state universities in Tennessee. It is hoped that these competencies, if used, could be objectively assessed to develop a high level of validity and reliability.

Place a check mark in the appropriate column for your evaluation of each competency. "Essential" means that a physical education teacher teaching at the secondary level should possess the basic knowledge as a vital part to competent teaching.

	<u>Essential</u>	
	Yes	No
1. Compare the principles of knowledge testing for mastery with testing for discrimination.		
2. The affective domain includes behavior, sportsmanship, social adjustment, attitudes, and values. Why would teachers measure these traits and what various ways would the information be collected?		
3. How can sport skills tests be used to support the objectives of teaching physical education?		
4. When a student is tested for balance, what is observed and recorded?		

		<u>Essential</u>	
		Yes	No
5.	Agility has been found to be an important factor in predicting skill in certain sports, such as volleyball and basketball. What are the problems associated with agility testing that affect the scoring?		
6.	The measure of leg power appears to be useful for predicting success in football. Explain the components of power and why this relationship exists.		
7.	What are the relationships between anthropometric measures and physical performance?		
8.	Describe two tests which can be used to determine cardiovascular efficiency which are easy to administer and do not require expensive laboratory equipment.		
9.	What is the difference between static and dynamic muscular endurance? What is a good test for each? What is the relationship to strength testing?		
10.	Compare the merits and problems of isotonic and isometric strength tests.		

		<u>Essential</u>	
		Yes	No
11.	What is flexibility? Describe a test for measuring the flexibility of the hamstring and lower back muscles.		
12.	Given a group of test scores, determine an index of item discrimination for each score. From the results decide what items should be retained, improved, or eliminated.		
13.	When given a set of skill test scores, determine the grade for each student using percentage correct or absolute standard, normal curve, and contract methods.		
14.	What are reliability and validity? What factors affect these test characteristics?		
15.	Given the formulas and an array of data, describe the purpose of each and determine each of the following: _____percentile rank _____mean _____standard deviation _____Z-score _____Spearman rank-order correlation		

APPENDIX D
SUGGESTED COMPETENCIES IN UNDERGRADUATE
ORGANIZATION AND ADMINISTRATION

**Suggested Competencies in Undergraduate
Organization and Administration**

These competencies were developed from the material presented in the various texts used to teach this course in the four-year state universities in Tennessee. It is hoped that these competencies, if used, could be objectively assessed to develop a high level of validity and reliability.

Place a check mark in the appropriate column for your evaluation of each competency. "Essential" means that a physical education graduate teacher teaching at the secondary level should possess the basic knowledge as a vital part to competent teaching.

	<u>Essential</u>	
	Yes	No
1. Describe the criteria essential to meaningful measurement and evaluation of students in physical education.		
2. Describe an efficient, all around physical education facility. Include important facets of indoor activity areas, swimming pools, and outdoor areas.		
3. Discuss the factors needed to be considered when purchasing athletic equipment.		
4. Describe the procedures which are essential for the proper care of equipment.		

	<u>Essential</u>	
	Yes	No
5. Discuss how interschool athletics contribute to the educational goals.		
6. Describe the functions of the state high school athletic association.		
7. Elaborate on the problems of eligibility, recruiting, and athletic awards.		
8. Diagram the organization of the ideal school health program into three categories. Include at least three topics or components in each area.		
9. Develop a well-rounded, active intramural program. Take into consideration facilities, climate, and objectives of intramurals.		
10. Compare the advantages and disadvantages of the round robin, elimination, and challenge tournaments. Sketch the organization of each.		
11. Discuss the factors necessary for proof of negligence.		
12. Present the common defenses against negligence.		
13. Describe the areas of potential negligence and liability.		

Essential

Yes No

14. Prepare a \$11,000 annual budget. Include the information to formulate the budget, the items for expenditure, and revenue sources.
15. Outline a public relations program. Include the basic principles to be considered, the purposes, target audiences, and major publicity media you would use and why.

APPENDIX E
LETTER TO SCHOLARS

Dear Dr. _____:

In our continuing effort to upgrade our professional preparation we are attempting to clarify the focus of our teaching objectives. In pursuit of this regard, there is attached a list of suggested competencies in the area of _____. We are asking professors at the four-year state institutions in Tennessee who have taught this undergraduate course at least three times to participate in this study.

I would be most appreciative if you would take a few minutes from your already super-busy schedule to respond to this document. We will, of course, be happy to furnish you with the results of our study for your own research. If there is to be any publication of any of these data, your individual answers will not be revealed. All responses will be held strictly in confidence.

Thanking you in advance for your cooperation in this endeavor, I remain

Sincerely yours,

/s/

Glen Emery

Encl.

APPENDIX F
LETTER TO GRADUATES

Dear _____:

In our continuing effort to upgrade our professional preparation we are attempting to clarify the focus of our teaching objectives. In pursuit of this regard, there is attached a list of competencies in the area of _____. We are asking selected graduates of the four-year state institutions in Tennessee who have taught at the secondary level at least three years to participate in this study.

I would be most appreciative if you would take a few minutes from your already super-busy schedule to respond to this document. We will, of course, be happy to furnish you with the results of our study for your own research. If there is to be any publication of any of these data, your individual answers will not be revealed. All responses will be held strictly confidential.

Thanking you in advance for your cooperation in this endeavor, I remain

Sincerely yours,

/s/

Glen Emery

Encl.

BIBLIOGRAPHY

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Books

- Barrow, Harold M., and Rosemary McGee. A Practical Approach to Measurement in Physical Education. 3rd ed. Philadelphia: Lea and Febiger, 1979.
- Baumgartner, Ted A., and Andrew S. Jackson. Measurement for Evaluation in Physical Education. Boston: Houghton Mifflin, 1975.
- _____. Measurement for Evaluation in Physical Education. 2nd ed. Dubuque, Iowa: Wm. C. Brown Company, 1982.
- Bucher, Charles A. Administration of School Health and Physical Education Programs. 7th ed. St. Louis, Missouri: C. V. Mosby Company, 1980.
- deVries, Herbert A. Physiology of Exercise. 2nd ed. Dubuque, Iowa: Wm. C. Brown Company, 1974.
- Dunn, J. D., Elvis Stephens, and J. Roland Kelley. Management Essentials: Resource. New York: McGraw-Hill Book Company, 1973.
- Educational Testing Service. The Undergraduate Program for Counseling and Evaluation. Princeton, New Jersey, 1971.
- Frost, Reuben, and Stanley Marshall. Administration of Physical Education and Athletics. Dubuque, Iowa: Wm. C. Brown Company, 1977.
- Guilford, J. P. Fundamental Statistics. 2nd ed. New York: McGraw-Hill Company, 1950.
- Johnson, Barry L., and Jack K. Nelson. Practical Measurements for Evaluation in Physical Education. 3rd ed. Minneapolis: Burgess Publishing Company, 1979.
- Kirkendall, Don R., Joseph J. Gruber, and Robert E. Johnson. Measurement and Evaluation for Physical Educators. Dubuque, Iowa: Wm. C. Brown Company, 1980.

- Lamb, David R. Physiology of Exercise. New York: Macmillan Publishing Company, Inc., 1978.
- Mathews, Donald K., and Edward L. Fox. The Physiological Basis of Physical Education and Athletics. 2nd ed. Philadelphia: W. B. Saunders Company, 1976.
- Morehouse, Laurene E., and Augustus T. Miller, Jr. Physiology of Exercise. 7th ed. St. Louis: C. V. Mosby Company, 1976.
- The National Conference on Undergraduate Professional Preparation in Health Education, Physical Education and Recreation. Washington, D.C.: American Association for Health, Physical Education and Recreation, 1948.
- Professional Preparation in Dance, Physical Education, Recreation Education, Safety Education and School Health Education. Washington, D.C.: American Association for Health, Physical Education and Recreation, 1974.
- Professional Preparation in Health Education, Physical Education, and Recreation Education. A report of a national conference. Washington, D.C.: American Association for Health, Physical Education, and Recreation, 1962.
- Resick, Mathew C., Beverly L. Seidel, and James C. Mason. Modern Administrative Practices in Physical Education. 2nd ed. Reading, Mass.: Addison-Wesley Publishing Company, 1975.
- Strauss, Richard H., ed. Sports Medicine and Physiology. Philadelphia: W. B. Saunders Company, 1979.
- Voltmer, Edward, Arthur Esslinger, Betty McCue, and Kenneth Tillman. The Organization and Administration of Physical Education. 5th ed. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1979.

Journals

- The Australian Council for Health, Physical Education and Recreation National Journal, 99-109 (1983-1985).
- Australian Journal of Physical Education, 55-66 (1972-1974).

Australian Journal for Health, Physical Education and Recreation, 67-98 (1975-1983).

Canadian Association for Health, Physical Education, and Recreation Journal, 39-51 (1972-1985).

Journal of Health, Physical Education and Recreation, 1-45 (1930-1974).

Journal of Physical Education, 67-78 (1969-1980).

Journal of Physical Education and Recreation, 46-52 (1975-1981).

Journal of Physical Education, Recreation and Dance, 52-57 (1981-1986).

Physical Educator, 1-43 (1942-1981).

Quest, 1-37 (1963-1985).

Research Quarterly, 1-50 (1930-1979).

Research Quarterly for Exercise and Sport, 51-56 (1980-1985).