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**DIFFERENCES AMONG ACCREDITED ATHLETIC TRAINING
EDUCATION PROGRAMS IN PREPARING STUDENTS FOR
THE NATIONAL CERTIFICATION EXAMINATION**

by

Donna M. Ritenour

**A Dissertation
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Doctor of Education
Department of Teaching, Learning,
and Leadership**

**Western Michigan University
Kalamazoo, Michigan
June 2002**

DIFFERENCES AMONG ACCREDITED ATHLETIC TRAINING EDUCATION PROGRAMS IN PREPARING STUDENTS FOR THE NATIONAL CERTIFICATION EXAMINATION

Donna M. Ritenour, Ed.D.

Western Michigan University, 2002

A retrospective quantitative study that surveyed all of the CAAHEP accredited athletic training education programs was performed. The purpose of this study was twofold: (1) what are the institutional and programmatic characteristics associated with the colleges/universities that sponsor CAAHEP accredited entry level athletic training education programs, and (2) do these differences significantly alter the preparedness of students for the athletic training profession. Athletic Training Education Programs that were developed prior to 1993 were compared to those programs that were developed after 1993 to determine if institutional or programmatic characteristic differences exist among the Colleges/Universities that sponsor CAAHEP accredited entry level athletic training education programs. The institutional and programmatic characteristics of the CAAHEP accredited athletic training education programs were also researched to determine if there are any characteristics that are significant predictors for determining an institution's first time pass percentage on the national certification examination. Differences were found to exist among accredited athletic training education programs and when combined using a multiple linear regression analysis, a 31.1 prediction percentage for the first time pass percentage on the national certification examination was reported ($p < .05$).

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CHAPTER I

INTRODUCTION

The Athletic Training Profession

Significant changes have occurred in the athletic training profession during the past twelve years that have resulted in the transformation of the education standards for the entry-level athletic trainer. These changes have included: (1) the American Medical Association's recognition of the profession of athletic training as an allied health occupation; (2) the transition from the National Athletic Trainers' Association approval of undergraduate athletic training programs to a formal accreditation requirement; and (3) the elimination of the internship route for students to achieve professional certification. The National Athletic Trainers' Association (NATA) pursued formal recognition as an allied health occupation from the American Medical Association (AMA) as a prerequisite to seek accreditation for entry-level athletic training education programs (Delforge & Behnke, 1999). On June 21, 1990 the AMA formally recognized athletic training as an allied health profession (National Athletic Trainers' Association, 1990). "The effects of the AMA recognition...are not exclusive to educational institutions. The impact on regulatory legislation, practice in the non-traditional settings and insurance industry considerations are a few of the areas also affected (Behnke, 1991)."

The allied health recognition enabled entry-level athletic training education programs to shift from the NATA's curriculum approval process to a more reputable standard of accreditation. The revisions to the guidelines for entry-level athletic training education programs began in 1990, immediately following the allied health recognition. Representatives from the NATA's Professional Education Committee were appointed to a review committee that was formed to collaborate with the Committee of Allied Health Education and Accreditation, the accrediting agency for allied health education programs (Behnke, 1991). Sponsored by the AMA, the Committee of Allied Health Education and Accreditation was disbanded in 1994 and replaced by the Commission on Accreditation of Allied Health Education Programs (CAAHEP) as the accrediting agency. The purpose for the change in accreditation agencies was to recognize the AMA as a cosponsor instead of the primary sponsor (Delforge & Behnke, 1999). "CAAHEP is the largest specialized accrediting body in the country, serving nearly 2000 programs in over 1200 institutions and representing 17 allied health professions (Leverenz, 2001)."

The NATA appointed an ad hoc task force to address the condition of athletic training education, and professional preparation of the certified athletic trainer. All of the task force recommendations to the NATA were accepted, to include, the requirement that candidate eligibility to take the national certification examination must include graduation from a CAAHEP accredited athletic training education program (Delforge & Behnke, 1999). Pending this policy change on January 1, 2004, all institutions will be forced to eliminate the internship route toward certification. This

mandate has forced institutions to assess the feasibility of incorporating the standards needed to become CAAHEP accredited. Compared to 68 NATA approved athletic training education programs in 1993, there are currently 138 CAAHEP accredited entry-level athletic training programs and 175 additional institutions recognized for initial accreditation (Delforge & Behnke, 1999; Education Council, 2001).

Guidelines for the Development and Implementation of NATA Approved Undergraduate Athletic Training Education Programs and the *Competencies in Athletic Training* were documents that were used to develop the Essentials and Guidelines for an Accredited Education Program for the Athletic Trainer. On December 6, 1991 the AMA and other cosponsors approved these new accreditation standards. (Delforge & Behnke, 1999). The Joint Review Committee for Education Programs in Athletic Training (JRC-AT) appointed a task force in order to assess and revise the educational domains and the respective competencies. The competencies were organized into seven educational domains (National Athletic Trainers' Association, 1993). The NATA Education Council conducted a fourth role delineation study in 1999 and has again revised the athletic training competencies. The athletic training educational competencies are currently in the implementation stage and by June 2002. they will be required of all entry-level athletic training education programs (National Athletic Trainers' Association, 1999). Colleges and universities with current accredited entry-level athletic training programs are confronted with the task of incorporating these revised athletic training educational competencies into their respective curriculums to meet the CAAHEP accreditation standards.

The Commission on Accreditation of Allied Health Education Programs provides detailed standards and guidelines of the required didactic and psychomotor components that are unambiguous and similarly interpreted by athletic training program directors. Consequently, it appears that the ability for an athletic training education program to establish individual uniqueness is determined by the institutional characteristics and the quality of clinical experiences in which students are exposed.

Athletic training education programs are awarded accreditation based on the institution's consistency and conformity to the CAAHEP standards and guidelines. The importance in ensuring academic standards through an accreditation process is recognized and supported by certified athletic trainers and the profession's academic leaders. However, in addition to these standards, it is also necessary for institutions to provide the essential requirements for accreditation without compromising the institutional control of the program. This research serves to inform program directors of athletic training education programs of the programmatic characteristics and institutional differences among accredited athletic training education programs that may enhance the quality and effectiveness in preparing students for the athletic training profession. It is important to investigate these characteristics to determine if the differences exist between educational programs and if so, whether they affect the preparation of students for the athletic training profession.

Athletic Training Education Programs

Founded in 1950, the mission of the National Athletic Trainers' Association is to enhance the quality of the physically active through the exchange of ideas, knowledge and the methods of athletic training. The athletic training education concept began in 1955 with an initiative by the NATA in promoting the profession. The Committee in Gaining Recognition was the earliest committee responsible for creating educational standards and in 1959 approved the first curriculum model. The majority of the athletic training curricula existed in Colleges of Education and Departments of Physical Education. Along with the athletic training courses, the original model included physical therapy prerequisite courses and a requirement to obtain a secondary education teaching certification (Delforge & Behnke, 1999).

Two major historical events have significantly affected the athletic training profession, with particular impact on the construct of entry-level athletic training education programs (ATEP). The Professional Education Committee was established by NATA in 1969 to regulate and approve institutions with athletic training education programs, and the following year, the Certification Committee developed and administered the first certification examination for the entry-level athletic trainer. To be formally recognized as an athletic trainer prior to the introduction of the certification examination, one of four routes was accepted: apprenticeship, graduating from an accredited physical therapy program, special consideration, or five years experience working in the profession (Delforge & Behnke, 1999; Grace, 1999).

The NATA Professional Education Committee was the governing agency for program approval of all entry-level athletic training education programs from 1969 to 1993. The Professional Education Committee originally researched the process required for program accreditation in 1970, and concluded that before accreditation could be pursued, the athletic training profession needed more time to emerge and develop. Growth of the athletic training profession accelerated over the next decade and in 1982 the first role delineation study was completed. The Role Delineation Study provided the foundation for the resource manual, *Guidelines for Development and Implementation of Approved ATEP* that was developed the following year. The guidelines contained in the manual were used by the Professional Education Committee to evaluate and approve entry-level athletic training education programs. The NATA Board of Directors approved the mandate that all programs developed after 1986, and the existing athletic training education programs were to offer a major or specific program of study in athletic training. The NATA Board of Directors also authorized an initiative for the Professional Education Committee to contact the AMA's Committee on Allied Health Education and Accreditation (CAHEA) to inquire how to obtain accreditation standards for athletic training education programs (Delforge & Behnke, 1999).

The initial process for the athletic training education program accreditation required that athletic training be formally recognized as an allied health profession. Revisions to the governance of the NATA and subsequent recommendation from the Council on Medical Education, the AMA's House of Delegates officially recognized

athletic training as an allied health profession in 1990. The Joint Review Committee on Education in Athletic Training (JRC-AT) was then established. Comprised of certified athletic trainers once involved with the NATA Professional Education Committee, the mission of the JRC-AT and CAHEA was to develop essentials and guidelines for athletic training education programs and to also solicit additional support from reputable sponsors. The American Academy of Family Physicians, American Academy of Pediatrics and the American Orthopaedics Society for Sports Medicine formally established, and continue to provide sponsorship (Delforge & Behnke 1999; Grace, 1999; Mathies, Denegar, & Arnhold, 1995).

The NATA recommendation was for administrators of new and existing athletic training education programs to restructure and revamp curriculums in order to identify with the medical community as an allied health profession (Starkey 1998). The directional focus was to shift the athletic training education program to align with other health care professions such as physician's assistant, physical therapy, and nursing. The transition period for the transfer from the NATA Professional Education Committee approval to CAHEA accreditation of entry-level athletic training education programs occurred between 1991 to 1993. After 1993, the JRC-AT and CAHEA evaluated all approved programs scheduled for a five-year review and any newly developed programs prepared for initial accreditation. In February 1994, the first two institutions were awarded CAHEA accreditation (Delforge & Behnke, 1999).

The accreditation agency for AMA's allied health programs was also in a period of transformation. CAHEA was phased out and the Commission on

Accreditation of Allied Health Education Programs (CAAHEP) was formed to become the accrediting agency for various allied health education programs. Recognized by the Council on Higher Education and the Committees on Accreditation, CAAHEP operated the accreditation process similar to CAHEA, which enabled a smooth transition. The NATA Professional Education Committee was disbanded in 1998 since the process of program accreditation was shifted to CAAHEP and the JRC-AT. At that time, 68 of the original NATA approved entry-level athletic training education programs were granted CAAHEP accreditation (Commission on Accreditation of Allied Health Education Programs, 2001; Delforge & Behnke, 1999).

At its inception in 1959, the NATA's Professional Education Committee required each student to obtain a teacher's certification in physical education as an eligibility requirement to become an athletic trainer. Although removed in 1970, many institutions continue to align their athletic training programs within the College of Education, or the Department of Physical Education (and analogous titles) and continue to endorse teacher education certification as an additional credential. Since the job market for full time athletic training positions are competitive, athletic training students are recommended to seek employment in high schools as educators with an additional stipend for athletic training services. A teaching certification provides the certified athletic trainer with the credentials needed to obtain full time employment in the public school setting (Behnke, 1991).

As the profession gained in recognition by the general population and among health care professionals, athletic training educators indicated that it was essential to

develop a curriculum based exclusively on athletic training content areas, and to not emphasize the need for a teacher education certification (Lawson, 1988; Moss & Parks, 1991; Starkey & Henderson, 1995; Starkey, 1998). Moss and Parks (1991) reported 29.7 percent of the entry-level certified athletic trainers that graduated between the years 1985 to 1990 were employed in the high school setting, while an additional 50.2 percent of the entry-level certified athletic trainers gained employment in a sports medicine clinic. A study investigating the enrollment of athletic training students in 72 athletic training education programs found that only 25 percent of students graduated with a teacher's education certification (Curtis, 1995). Current recommendation for administrators of new and existing athletic training education programs is to restructure and revamp curriculums that identify with the medical community and as an allied health profession. One of the most noted is the recommendation that athletic training education programs should be housed in the Department, College or Division of Allied Health (Starkey & Henderson, 1995; Starkey, 1998).

National Certification Examination

The mission of the NATA Board of Certification (BOC) is to ensure that "...the public is protected by credentialing only those professionals who have met the entry-level qualifications appropriate for a practicing professional (Sammarone-Turkey, Comfort, Perrin & Gieck, 2000, p. 75)." The NATABOC designates

certification criteria for the athletic trainer by establishing and maintaining entry-level standards, determining candidate eligibility standards to take the certification examination, and in collaboration with the CASTLE Worldwide Incorporated, issuing certification credentials to the athletic training professional (Grace, 1999; NATABOC, 2001). Starting in 2004, the NATA Board of Certification requires all students who wish to sit for the certification examination to meet academic and clinical requirements from a CAAHEP accredited program. An internship route to certification is an alternate approach that requires 1500 hours of clinical experience, a bachelor's degree, and seven required courses. The upcoming elimination of the internship route as a path for certification is the most recent significant change in the athletic training profession. By the year 2004, in order to meet the requirements for certification, one must be a graduate of a CAAHEP accredited athletic training education program. This requirement has forced many institutions to phase out their non-accredited athletic training education programs, or to develop a curriculum based on the accreditation standards established and mandated by the JRC-AT and CAAHEP.

The growth of the profession during the 1980s was dramatic and the process of certification eligibility, particularly the certification examination, was expanded. The initial version of the role delineation study was completed in order to define the actual role of the practicing certified athletic trainer. The role delineation study provided the resources needed to develop the educational competencies in athletic training. These competencies were provided to all institutions that have or are actively developing an athletic training education program.

The NATA pursued and obtained Board of Certification accreditation from the National Commission for Certifying Agencies in 1982. To retain this recognition, the certification of athletic trainers had to remain compliant with the Commission's certifying standards. Individual state athletic training organizations began to solicit for licensing, which was completed with the understanding that the NATA certification process was the standard for recognition as a certified athletic trainer (Grace, 1999). An independent testing agency also needed to be instituted to obtain the accreditation from the National Commission for Certifying Agencies. The NATA established and officially appointed the NATA Board of Certification (BOC) to be responsible for all certification issues and to ensure a reliable and valid means for certifying candidates. The role delineation study was completed in order to establish objective testing that was based on reliable measures. Revisions to the athletic training professional domains were completed and continue to be the standard content areas that are currently used today. To avoid the risk of antitrust and liability issues, the NATA as well as the state governing agencies withdrew from all certification and licensing activity in 1989 and the NATABOC established incorporation. The NATABOC has certified over 20,000 athletic trainers, which is a ten fold increase since the 1970's (Grace, 1999).

The Research Proposal

Statement of the Problem

The reform and transformation within the athletic training profession has dramatically changed the way athletic training students are being educated. Mandate for all institutions to phase out internship as a route to certification has forced many institutions to assess the feasibility of incorporating the standards required becoming CAAHEP accredited. In spite of the introduction of the CAAHEP accreditation requirements to all entry-level athletic training programs and revisions to the standards and guidelines, pass rate on the national certification examination has resulted in minimal improvement. The 2000 Annual Report from the NATABOC reports that the first time pass percentage for candidates taking the NATA Board of Certification exam was 45.4 percent for those candidates that graduated from accredited programs (NATABOC, 2001).

The term “certification” is used to describe the minimum proficiencies an individual would need to practice as a certified athletic trainer. With the progress that has been made with education reform over the last decade, performance outcomes upon graduation from a CAAHEP accredited ATEP appears not to have improved the first time success rate on the national certification examination. As stated by Sammorone-Turcey et al. (1999), “If there is a low correlation between what is being taught in athletic training education and what is being tested on the NATABOC [national certification] examination, further analysis of the current relationship between

athletic training education and certification should be done” (pp. 74). The reform of entry-level athletic training education warrants the investigation of the CAAHEP accredited ATEP to determine what differences exist, with particular, interest to athletic training education programs that were established prior to CAAHEP accreditation standards and guidelines that were imposed after 1993. It is unclear whether specific programmatic and institutional characteristics affect the preparation of students for the athletic training profession, specifically the ability to predict a candidate’s first time success in passing the national certification examination (Erickson & Martin, 2000; Hankins, 1996; Harrelson, Gallaspy, Knight, & Lever-Dunn, 1997; Middlemas, 1999; Sammarone-Turcey et al., 2000; Starkey & Henderson, 1995; Williams, 1998; Winters, 1995).

Purpose of the Study

The purpose of this study is twofold: (1) what are the institutional and programmatic characteristics associated with the colleges/universities that sponsor CAAHEP accredited entry-level athletic training education programs, and (2) do these differences significantly alter the preparedness of students for the athletic training profession. It is important to investigate these characteristics to determine if the existence of institutional and programmatic differences between athletic training education programs affect the preparation of students for the athletic training profession, specifically the ability to predict a candidate’s first time success in passing the national certification examination. What institutional and programmatic

characteristics are statistically significant predictors for determining an institution's first-time pass percentage on the NATA Board of Certification examination?

Delimitation of the Study

The scope of the research study is delimited to the following topic areas and is presented in the conceptual model found in Figure 1.

1. The year the athletic training education program was initially developed was assessed. The entry-level athletic training education programs that were initially approved by the NATA Professional Education Committee prior to the transition to CAAHEP accreditation have been compared to the entry-level ATEPs that were initially developed after the implementation of CAAHEP accreditation standards in 1993.

2. The institutional characteristics that were studied includes the Carnegie classification of the educational institution, the College, Division or Department location of the entry-level athletic training education program, the number of faculty and clinical educators at the institution, and the number of students that are accepted to the ATEP each year.

3. The programmatic characteristics that have been studied were separated according to the didactic, psychomotor and affective behavioral models. The admission standards and the curriculum requirements are the didactic criterions that were included in this study. The clinical competency requirements, the athletic affiliation of the primary clinical setting and the structure of the clinical experiences are

the psychomotor characteristics have been assessed. The affective characteristics of entry-level ATEPs were assessed by identifying the various resource materials that were made available to the athletic training students (Appendix A).

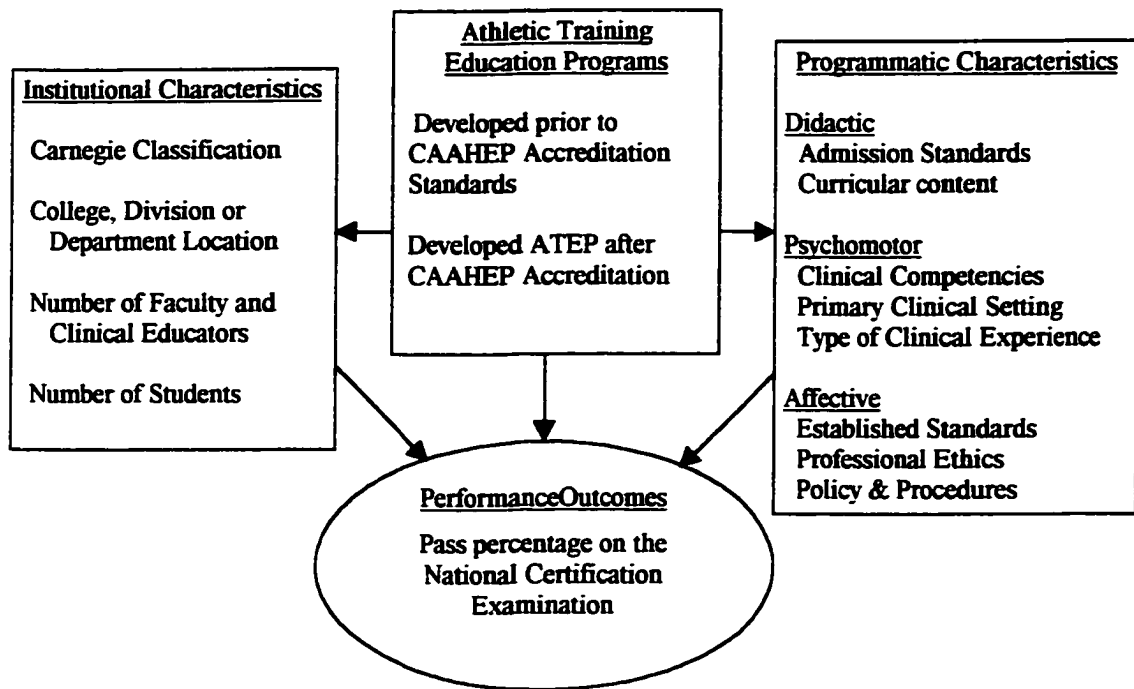


Figure 1. Conceptual Model for Researching CAAHEP Accredited ATEPs

Research Questions

The focus of this research is to investigate the following research questions:

1. Are there any differences in the institutional characteristics between the entry-level athletic training education programs that were initially approved by the NATA Professional Education Committee prior to the transition to CAAHEP

accreditation compared to the entry-level ATEPs that were initially developed after the implementation of CAAHEP accreditation standards in 1993.

2. Are there any differences in the programmatic characteristics between the entry-level athletic training education programs that were initially approved by the NATA Professional Education Committee prior to the transition to CAAHEP accreditation compared to the entry-level ATEPs that were initially developed after the implementation of CAAHEP accreditation standards in 1993.

3. Does the first time pass rate on the national certification examination differ between the entry-level athletic training education programs that were initially established prior to 1993 compared to the entry-level ATEPs that were initially developed after the implementation of CAAHEP accreditation standards.

4. Do institutional characteristics predict an institution's first-time success in passing the National Athletic Trainer's Board of Certification Examination, and if so, which institutional characteristics are statistically significant predictors for the first-time pass percentage on the national certification examination?

5. Do programmatic characteristics predict an institution's first-time success in passing the National Athletic Trainer's Board of Certification Examination, and if so, which programmatic characteristics are statistically significant predictors for the first time pass rate on the national certification examination?

Definition of Terms

American Medical Association (AMA)

The AMA is the largest medical association in the nation, and recognizes athletic training and 16 other occupations as allied health professions (Delforge & Behnke, 1999).

Athletic Training Education Program (ATEP)

Entry-level athletic training education programs located in various colleges and universities across the country that has obtained CAAHEP accreditation.

Commission on Accreditation of Allied Health Education Programs (CAAHEP)

Recognized by the Council for Higher Education Accreditation, CAAHEP is the accrediting agency for all entry-level athletic training education programs (Leverenz, 2001).

Joint Review Committee on Education in Athletic Training (JRC-AT)

This committee serves as the accreditation review committee for entry-level athletic training education programs. All institutions seeking accreditation or accreditation renewal are first required to make applications to this committee (Delforge & Behnke, 1999).

National Athletic Trainers' Association (NATA)

An association of athletic trainers and other sports medicine professionals with the mission to enhance the quality of health for the physically active through the exchange of ideas, knowledge and the methods specifically pertaining to athletic training (NATA, 2001).

National Athletic Trainers' Association Board of Certification (NATABOC)

This agency is responsible for the certification of the entry-level athletic trainer and also researches and identifies standards for the athletic training profession. The NATABOC has been the independent decision-maker for all certification issues since 1989 (Grace, 1999).

National Athletic Trainers' Association Education Council

Comprised of members from the National Athletic Trainers' Association Board of Certification and the Joint Review Committee on the Education in Athletic Training, the Education Council serves as clearinghouse for educational policy, development and delivery (Delforge & Behnke, 1999).

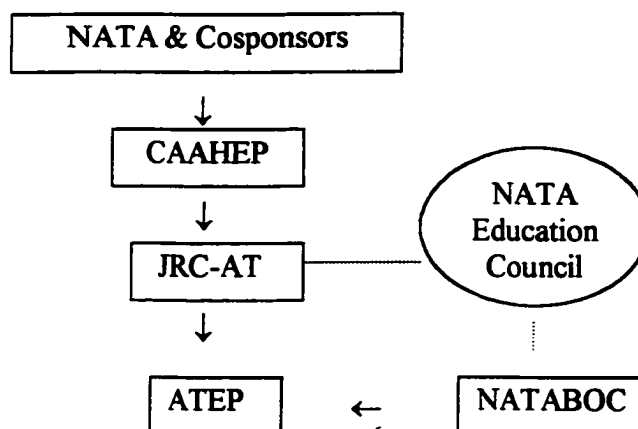


Figure 2. Governing Agencies for the Accreditation of ATEP

Proposal Overview

This study will research the institutional and programmatic characteristic differences between the entry-level ATEPs that were established prior to 1993 to those subsequently established programs initially developed after the CAAHEP accreditation requirements were implemented. It is important to investigate these characteristics to determine if the existence of institutional and programmatic differences between athletic training education programs affect the preparation of students for the athletic training profession, specifically the ability to predict an institution's first time success in passing the national certification examination. Program directors of entry-level athletic training education programs need to be informed of these differences in order to enhance the quality and effectiveness in preparing students for the athletic training profession.

The following chapter will provide a literature review of the research that relates to the educational process of the athletic training students and previous studies that identified predictors of success in preparing students for the athletic training profession, specifically, success on the national certification examination.

CHAPTER II

LITERATURE REVIEW

Athletic Training Education

Significant changes have occurred in the athletic training profession during the past twelve years that have resulted in a transformation of the education standards for the entry-level athletic trainer. The transition from the NATA approval of undergraduate athletic training programs to a formal accreditation requirement of all Athletic Training Education Programs started immediately following the American Medical Association's declaration that athletic training is an allied health profession. The revisions to the guidelines for entry-level athletic training education programs also resulted in a mandate by the National Athletic Training Board of Certification that after January 1, 2004, all candidates who want to take the national certification examination must possess a degree from an institution that sponsors a CAAHEP accredited athletic training education program. This mandate has forced institutions to assess the feasibility of incorporating the necessary revisions to their curriculum to comply with CAAHEP accreditation standards.

The Commission of Accreditation of Allied Health Education Programs provides detailed standards and guidelines of the required didactic and psychomotor components that are unambiguous and similarly interpreted by athletic training program directors. Consequently, it appears that the ability for an entry-level athletic

training education program to establish individual uniqueness is determined by the institutional characteristics and the quality of clinical experiences in which students are exposed. The individual uniqueness of an ATEP is the result of the institutional and programmatic characteristics and the clinical experiences in which students are exposed. Do certain programmatic and institutional characteristics of the entry-level ATEPs make them more successful, and what are the particular institutional characteristics that may enhance the quality and effectiveness in preparing students for the athletic training profession.

The purpose of this study is to determine if the institutional and programmatic characteristics for the entry-level ATEPs that were established prior to CAAHEP accreditation requirements in 1993 differ from those ATEPs subsequently established after 1993. It is important to investigate these characteristics to determine if existence of institutional and programmatic differences between athletic training education programs affect the preparation of students for the athletic training profession, specifically the ability to predict a candidate's first-time success in passing the national certification examination. Program directors of entry-level athletic training education programs need to be informed of the programmatic characteristics and institutional differences that may enhance the quality and effectiveness in preparing students for the athletic training profession.

This chapter is divided into three major sections: (1) a review of the current literature in the area of educational competencies for the athletic training profession, (2) the performance outcomes on the national certification examination as perceived

by the candidates and ATEP Directors, and (3) programmatic and institutional differences among all of the current athletic training education programs. The chapter concludes by outlining the specific questions that were researched.

Educational Competencies

“The *Competencies in Athletic Training* serve as a guide to [the] development of educational programs and learning experiences leading to NATA certification as an athletic trainer and is intended to assist administrators, instructional personnel and students in identifying knowledge and skills to be mastered (NATA, 1992, p. i).”

Specific standards and established minimal educational proficiencies that are needed in order to become a certified athletic trainer have been identified by the NATA Board of Certification (BOC). Role Delineation Studies are conducted periodically by the NATABOC, with the most recent and fourth edition completed in 1999, it serves as the primary source for the development of athletic training education competencies. Athletic training competencies are identified in the form of cognitive, psychomotor and affective behavioral objectives supplement the Role Delineation Study and provides an implementation plan, but are the primary responsibility of the institutional administrators and faculty (NATA, 1992).

The NATA Board of Directors approved the new Athletic Training Competencies in February of 1999 and by June 1, 1999 the new competencies entitled,

Athletic Training Educational Competencies, were available to each institution for implementation (NATA, 1999). Revised from the 1992 athletic training competencies that were provided by the NATA Professional Education Committee, the new competencies are organized into twelve content areas (Table 1). The NATA Joint Review Committee has permitted a two-year period for the implementation process to occur. By June 1, 2002 all institutions seeking CAAHEP accreditation will be assessed based on the revised competencies.

Table 1
Athletic Training Competencies

Existing Competency Domains	New Content Areas
Prevention of Athletic Injury & Illness Recognition & Evaluation Management, Treatment & Disposition	Risk Management & Injury Prevention Assessment & Evaluation Acute Care of Injury & Illness Pathology of Injury & Illness Pharmacology General Medical Conditions & Disabilities Nutritional Aspects of Injury & Illness
Rehabilitation of Athletic Injuries	Therapeutic Exercise Therapeutic Modalities
Organization & Administration	Health Care Administration Professional Development & Responsibilities
Education & Counseling	Psychosocial Intervention & Referral

(NATA, 1999)

The new educational content areas and competencies in the field of athletic training continue to be classified into cognitive, psychomotor, and affective behavioral objectives. More than 530 didactic and 1200 clinical competencies are required to be included within the curriculum of each ATEP in the form of didactic and clinical experience. Each institution is responsible to implement these competencies in a manner that is specifically appropriate for their respective programs. In addition, specific clinical proficiencies are included within the new competencies in order to clarify the requirements for psychomotor outcomes. The JRC-AT is responsible in monitoring and evaluating the implementation of the CAAHEP accreditation standards and guidelines in the accreditation process for institutions. The standards identify the minimum criterion that is required of an institution with an accredited athletic training education program, whereas the guidelines serve to provide a general model in which to implement these requirements. (Behnke, 1994; NATA, 1999).

Clinical Education

CAAHEP accredited ATEP must provide a clinical education setting that integrates theory and practical experiences that will incorporate cognitive knowledge learned behavior and attitudes into clinical skills. Laurent and Weidner (2001) studied the characteristics of the clinical educator and found that there is a high correlation between the students' ability to learn and the clinical educators' characteristics. Laurent & Weidner (2001) also report that students tend to learn best by modeling

behavior and least through the integration of knowledge and research. In a related study using the Kolb Learning Inventory Style, researchers found no significance between the different types of learning styles and admission into athletic training education programs (Brower, Stemmans, Ingersoll, & Langley, 2001). With this in mind, the clinical educator needs to be the facilitator of appropriate psychomotor development while aware of the students' individual learning styles.

The clinical education requirements that were initially introduced in 1969 required each student to complete 800 hours of clinical experiences over a two-year period. Researchers have concluded that the quantity of educational experiences a student devotes clinically has no influence on the first-time success in passing the national certification examination (Draper, 1989; Middlemas, Manning, Gazillo & Young, 2001; Sammarone-Turcey et al., 2000; Starkey, 1995). The newly revised educational competencies that are scheduled for program implementation in the 2002-2003 academic year include the elimination of the 800-hour requirement. Although individual institutions will be permitted to require a set number of hours, the focus will be directed toward performance assessments. The goal for the athletic training education programs is to focus on quality outcomes-based clinical educational experience (NATA, 1999). Quality clinical experience among CAAHEP accredited ATEP needs to be officially defined and an objective evaluation process is warranted (Laurent & Weidner, 2001; Middlemas et al. 2001).

Clinical education sites must be able to provide a variety of experiences with an adequate patient population and the athletic training students must be able to actively

participate in all aspects of the delivery of athletic training services. The intercollegiate athletic department within the institutions that sponsors an ATEP is predominately the primary clinical setting for athletic training psychomotor development. This is reflected in the study completed by Sammarone-Turcey et al. (2000) when they reported that 71 percent of all clinical experiences documented by the students were completed at the college/university setting. With the exception of the guidelines presented by Laurent and Weidner (2001) and the documentation of clinic hours, no set standards have been established, or made available to the athletic training educator that can be used to measure appropriateness of the athletic training clinical education setting. The proposed guidelines are based on one that was developed to assess clinical experiences for students of physical therapy programs and was revamped to align with the accepted CAAHEP standards and guidelines.

Primary Clinical Site

A candidate from an accredited ATEP is required to have an extensive clinical experience to sit for the NATA Board of Certification examination. The athletic training students gain the majority of their required clinical experiences in the institution's athletic training department. The athletic training program director works closely with the institution's athletic department, specifically the clinical education coordinator and the intercollegiate staff athletic trainers in order to ensure a quality clinical experience. The type of educational experience, although similar in some respects, can vary greatly depending on the institutional characteristics that are

available and structure of the curriculum that is developed by each institution. Starkey and Henderson (1995) recommended additional research in this area specifically to address the quality of clinical experiences within the content and structure of athletic training education programs and educational resources that are available to students in the CAAHEP accredited ATEP. If the institutional and programmatic variables that influence the first time success rate on the national certification examination can be identified, program directors and institutional administrators integrate this information into their programs to better prepare their students for the NATABOC (Harrelson et al., 1997).

Predictors of Performance Outcomes

National Certification Examination

Content validity for the national certification examinations are carefully monitored by completing intensive role delineation studies and based on the 1999 role delineation study, the questions and scenarios that are used on the certification examinations accurately test the knowledge and skills needed to be a competent athletic trainer (NATA, 1999). A committee of volunteer certified athletic trainers is recruited from various employment settings in order to create the questions for the national certification examination. Each year, the NATABOC validates the certification examination using construct, content, face and criterion-related validity. The NATABOC statistically calculates performance on the certification examination and presents an annual report of the results. The 1999 and the 2000 testing results for

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the entry-level candidate from CAAHEP curriculum accredited programs report the overall first-time pass percentage to be 38.86 and 45.42 percent, respectively (NATABOC, 2000; NATABOC, 2001).

The examination is given in three sections: written, practical and a written simulation (Table 2). Reported by the NATABOC (2001), candidates from CAAHEP accredited curriculum programs scored significantly higher compared to the internship candidates in each section, as well as the overall pass rate success on the examination.

Table 2
1999 and 2000 NATABOC Examination Report

	1999			2000		
	n = 1055			n = 1133		
	Written	Practical	Simulation	Written	Practical	Simulation
Internal consistency	.78	.95	.95	.78	.94	.89
Reliability (KR20)						
Pass percentage	70.81	63.89	63.41	64.08	75.97	67.28

(NATABOC 2000, 2001)

This disparity of the overall pass percentages among the internship route candidates (36.58%) and those from CAAHEP curriculum accredited programs (45.2%) was used to validate the decision by the NATA to phase out the internship route to certification. Starkey and Henderson (1995) investigated success rates of first time candidates and also concluded that those from accredited ATEPs were even more

successful than what the NATABOC statistics reports on the written (19.9%), the practical (24.1%), and the written simulation (29%). The researchers removed all of the internship candidates that graduated from accredited allied health curriculum and in related fields such as physical therapy before the comparison of the success rates of the curriculum and the internship candidates. The percent differences in success rates of the curriculum compared to the internship candidates doubled in all three components of the certification examination. Although research exists to establish a relationship between CAAHEP accreditation requirements and an increased success in pass rate percentages on the national certification examination, other variables that affect the candidate's score on the examination need to be investigated (Middlemas, Manning, Gazillo & Young, 2001; NATABOC, 2000; NATABOC, 2001; Starkey & Henderson, 1995; Sammorone-Turcey, et al. 1999). The overall first-time pass rate for candidates that completed the national certification examination was well below the pass percentage of those candidates in other health care professions that were also required to pass a certification examination. Sammarone-Turcey et al. reported the 1997 overall first time pass rate for occupational therapy, physician assistant, and physical therapy professions to be over 85 percent (1999). An inference as to why over half of the first-time candidates from CAAHEP accredited ATEPs that do not pass national certification examination needs to be addressed.

Comparison of Institutional and Programmatic Characteristics

Institutional and programmatic differences between the CAAHEP accredited ATEPs in undergraduate institutions have been studied. Research was completed to determine predictors of success on the national certification examination (Draper, 1989; Erickson & Martin, 2000; Hankins, 1996; Harrelson, Gallaspy, Knight, & Lever-Dunn, 1997; Middlemas, 1999; Sammarone-Turcey et al., 2000; Starkey & Henderson, 1995; Williams, 1998; Winters, 1995). The most common variables researched include the student's overall GPA, GPA in core requirements, ACT scores, number of clinical hours, and the teaching experience of the staff and faculty.

Programmatic Characteristics

Programmatic characteristics of the ATEPs, the experience of supervising certified athletic trainers, allied health affiliation, and examination format did not attribute to the students success in passing the national certification examination (Sammarone-Turcey et al., 2000; Draper, 1989; Williams, 1998). Researchers did identify significance in the individual students' overall grade point average in predicting first-time success in passing the certification exam, however, there was no significance found with programmatic characteristics such as ACT scores, grade point average in theory (athletic training) courses, number of clinical hours, type of clinical experience, and number of years in ATEP (Draper, 1989; Harrelson et al., 1997; Middlemas, 1999; Middlemas, Manning, Gazillo & Young, 2001; Sammarone-Turcey, et al., 1999; Williams, 1998).

A study that was completed using the national certification examination that was given on January 17, 1988 revealed that candidates with a 3.5 grade point average (GPA) or higher was more successful on the written portion ($p = .05$), but no significance was found on the practical or written simulation sections (Draper, 1989). Significance was reported with grade point average (GPA) in the study completed by Harrelson et al. (1997), but only when the variables were combined. This research study combined overall GPA, athletic training GPA, academic minor GPA, along with the composite ACT score and number of semesters at enrolled as a full-time student and by using stepwise multiple linear regression, determined that these variables can be used to predict success on the national certification examination ($df = 5, 49$; $F = 3.36$; $p = .01$; $R^2 = .026$). The authors did recommend further research that would include many other ATEP since the subjects surveyed were all from the same institution and did not offer a CAAHEP accredited ATEP. Another study used grade point average and the number of clinical hours as predictors for performance on the national certification examination and found no significance with the number of clinical hours ($p = .07$), but the candidate's GPA was a significant predictor ($p = .001$) for overall success, as well as on the written, practical and the written simulation (Middlemas, et al., 2001).

Perceived Preparedness of Students

Program directors for CAAHEP accredited ATEP were surveyed to determine what they believe to be the predictors of first time success in passing the national

certification examination. This Delphi study revealed five areas: the type of clinical education setting and instruction, amount of theoretical knowledge and clinical application, and the ability to actively participate in the clinical experience that program directors believed to contribute to a candidate's first time pass success (Erickson & Martin, 2000). No significance was reported in a study of athletic training student's perceived preparedness to take the national certification examination. The students indicated that their perceived strengths were in the area of athletic injury prevention, recognition and management; and rehabilitation, organization and counseling were recognized as their weaknesses (Winters, 1995; Hankins, 1996).

Summary

Research of the current literature pertaining to the CAAHEP accredited ATEP does not reveal much insight in regards to institutional and programmatic characteristics, particularly the year the program was developed, and the prediction of an institution's first time pass percentage on the national certification examination. Researchers did identify a significance in the individual student's overall grade point average in predicting first-time success in passing the national certification examination, however, there was no significance found with characteristics such as ACT scores, grade point average in theory courses, number of clinical hours, type of clinical experience, and number of years in ATEP (Draper, 1989; Erickson & Martin, 2000; Harrelson et al., 1997; Middlemas, 1999; Sammarone-Turcey, et al., 1999; Williams, 1998).

An exhaustive review of the research found that there were no studies comparing the athletic training education programs that were developed prior to 1993 to those programs developed after 1993. The rationale to compare these two groups of ATEP includes, (1) the ability to determine if the implementation of the CAAHEP standards and guidelines have provided consistency among accredited programs; and (2) to determine if the athletic training education programs established prior to 1993 are more successful as a result of the years of experience. Additional factors for successfully passing the national certification examination are assumed and there needs to be additional studies to determine if predictors of success can be identified.

Chapter III will describe in detail the research study that is to be completed. The population and samples that will be used for the study, the instrumentation and the specific procedures will be provided. A discussion regarding the method of data collection and analysis will be defined, as well as those limitations that will exist. The focus of this research is to investigate the following research questions:

1. Are there any differences in the institutional characteristics between the entry-level athletic training education programs that were initially approved by the NATA Professional Education Committee prior to the transition to CAAHEP accreditation compared to the entry-level ATEPs that were initially developed after the implementation of CAAHEP accreditation standards in 1993.

2. Are there any differences in the programmatic characteristics between the entry-level athletic training education programs that were initially approved by the NATA Professional Education Committee prior to the transition to CAAHEP

accreditation compared to the entry-level ATEPs that were initially developed after the implementation of CAAHEP accreditation standards in 1993.

3. Does the first time pass rate on the national certification examination differ between the entry-level athletic training education programs that were initially established prior to 1993 compared to the entry-level ATEPs that were initially developed after the implementation of CAAHEP accreditation standards.

4. Do institutional characteristics predict a candidate's first time success in passing the National Athletic Trainer's Board of Certification Examination, and if so; which institutional characteristics are statistically significant predictors for the first time pass percentage on the national certification examination?

5. Do programmatic characteristics predict a candidate's first time success in passing the National Athletic Trainer's Board of Certification Examination, and if so; which programmatic characteristics are statistically significant predictors for the first time pass rate on the national certification examination?

CHAPTER III

METHODOLOGY

Overview

Program directors could better prepare their students for the national certification examination if they knew which institutional and programmatic variables could predict the first time success on the national certification examination. The purpose of this study is to determine if the institutional and programmatic characteristics differ from the entry-level ATEPs that were established prior to CAAHEP accreditation requirements in 1993 to the entry-level ATEPs that were established afterwards. It is important to investigate these characteristics to determine the existence of institutional and programmatic differences between athletic training education programs affect the preparation of students for the athletic training profession, specifically the ability to predict a candidate's first time success in passing the national certification examination. Also, equally important, is to inform program directors of entry-level athletic training education programs of the programmatic characteristics and institutional differences that may enhance the quality and effectiveness in preparing students for the athletic training profession.

Description of Research

A retrospective quantitative study designed to survey all of the CAAHEP accredited athletic training education programs was performed to compare the athletic training education programs that were developed approved by the NATA Professional Education Committee prior to 1993 to the ATEP that were developed afterwards and initially accredited by CAAHEP. The institutional and programmatic characteristics of all the CAAHEP accredited ATEPs were also researched to determine if there are any characteristics that are statistically significant predictors for determining first time success on passing the NATA Board of Certification examination. The overall national certification examination percentage, as well as the written, practical, and the written simulation sections of the examination for each institution were used as the predictor variable for the institutional and programmatic characteristics.

The institutional characteristics that were studied includes the Carnegie classification of the educational institution, the College, Division or Department location of the entry-level athletic training education program, the number of faculty and clinical educators at the institution, and the number of students that are accepted to the ATEP each year. Categorization of the institutional characteristics is identified in Appendix A.

The programmatic characteristics that were studied are separated according to the didactic, psychomotor and affective behavioral models. The didactic programmatic characteristics that were included in this study are the admission standards, and the curriculum requirements. The clinical competency requirements, the athletic affiliation

of the primary clinical setting and the structure of the clinical experiences are the psychomotor characteristics have been assessed.

Identifying the various resource materials that were made available to the athletic training students assessed the affective characteristics. The questions on the survey inquired to the professional and departmental resources that were available for the athletic training students during their clinical experience (Appendix B). The specific list of clinical and affective competencies that were included in this study are located in Table 3.

Population and Sample

Every CAAHEP accredited ATEP and their respective students from these programs that had taken the national certification examination during the 2000 reporting year was included in this study. The population for this study involved the 138 Colleges and Universities that have CAAHEP accredited athletic training education programs since 1999. A reference list of the accredited ATEPs was obtained from the CAAHEP (2001) web site. All of the data that was given to the researcher from each of the program directors surveyed was categorized according to institutional and programmatic characteristic. To maintain confidentiality of the students and the individual institutions the national certification examination scores were placed in a secure location once the scores were coded and placed in the data set. Three years after the completion of this study, the researcher will shred and dispose of all the national certification examination results used for this research.

Table 3

Clinical and Affective Competency List

A. Clinical Competencies that are required of all the athletic training students:

- Assignment with a fall football experience
- Assignment with a woman's sport experience
- Demonstrated competency using an isokinetic dynamometer
- Participation with preseason screenings and physical examinations
- Present athlete (and injury) to general medicine/internist for evaluation
- Present athlete (and injury) to orthopedic surgeon for evaluation
- Medical documentation on athletic injury/illness evaluations and rehabilitation
- Attendance at an annual seminar to review emergency techniques and protocols
- Job shadowing of allied health professionals other than certified athletic trainers
- Opportunity for the student to travel independently with assigned sport teams
- Opportunity for the student to independently cover organized sports practices
- Independently perform functional assessment for safe return to physical activity

B. Affective Competencies that are available to all of the athletic training students:

- Student Athletic Trainer Manual (policy, procedures expectations)
- Student Athletic Trainer Code of Conduct
- OSHA regulations & Exposure Control Plan to include annual review
- Access to educational resource and required text books in the clinic setting
- Access to a computer and Internet for research purposes
- Access to institutional policy and position stands regarding various medical situations
- Grievance procedure in place for the student athletic trainer
- Access to the formal staff & administrative structure
- Access to the policy on medical referral of the injured/ill athlete
- Rehabilitation protocols are available for the students to access and implement
- Student advisory board and student representation at staff meetings.

Instrumentation

The athletic training education program directors were surveyed to obtain information regarding the institutional and programmatic characteristic specific to their

institution. A questionnaire that contained specific questions relating to the sponsoring institutions and the athletic training education programs was used to gather information on basic details of the individual institutions and their respective ATEP (Appendix B). The survey was accompanied with a formal letter that explained the purpose of the study and defined the request of the participants (Appendix C).

A pilot study was completed prior to sending the survey to each of the institution's program director in order to determine the face validity of the questionnaire survey. Two faculty members from ATEPs that are not CAAHEP accredited but have applied for JRC-AT candidacy status and future accreditation were asked to review the survey. Feedback was solicited from these faculty members in regard to the appropriateness and the clarity of each of the survey questions. The specific wording of the psychomotor questions was revised, and an additional institutional characteristic (program directors years of experience) was added upon recommendation from both reviewers.

Data Collection Procedures

Procedures

The initial step involved the communication and written request for the 2000 examination results for each CAAHEP accredited institution from CASTLE Worldwide Incorporation, the NATABOC's testing agency. The NATABOC did not have an established mechanism in place to obtain this data for the specific purpose of

research, therefore, a petition request to the NATABOC Board of Directors to obtain this information was completed and promptly denied since the data contained confidential information. The decision to grant the researcher access to the 2000 test results was granted once permission was obtained from the program director from each of the institutions.

Telephone correspondence was made to every program director of a CAAHEP accredited ATEPs from October 3, 2001 to October 15, 2001. The telephone calls were necessary in order to inform the program directors of the forthcoming survey and to solicit permission to obtain the institution's NATABOC 2000 Annual Report. The Release of Confidential Information Form (Appendix D) was faxed to each of the program directors to read, sign and return by facsimile. On October 15, 2001 a survey was sent to 138 program directors that represented each of the CAAHEP accredited athletic training education programs. The program director from each of the institutions was asked to complete the survey and return it by November 1, 2001. One week after this deadline, follow up telephone calls were made to each of the program directors that did not return the survey, or who did not return the Release of Confidential Information form.

On December 17, 2001, the Release of Confidential Information forms were copied and sent to the NATA Board of Certification with a request to obtain copies of the 2000 examination results. Once the exam results were received on January 17, 2002, each institution was then coded and placed in the data set for statistical comparison (Appendix E). This survey contains mostly categorical and continuous

variables that were coded and placed in a data set using the SPSS ® 10.0 Statistical Software (SPSS Inc., Chicago IL). The data was then separated into two groups; (1) ATEPs initially established prior to 1993 and (2) ATEP initially developed after the implementation of CAAHEP accreditation standards.

Data Collection and Recording

The data was collected by using three different collection methods: (1) survey, (2) descriptive statistical data from the national certification examination for the year 2000, and (3) independent collection of data pertaining to the CAAHEP accredited ATEPs. All of the institutions were identified with a numeric code and the information that was collected was compiled on the Data Record Sheet (Appendix D). Consistent with the information on the Data Record Sheet, the institutions' national certification examination results were coded and placed in a data set by using the SPSS® 10.0 Statistical Software.

Data Processing and Analysis

The Statistical Package for the Social Sciences® statistical program (version 10.0, SPSS, Inc., Chicago, IL) was used to calculate the descriptive statistics, t-test, analysis of variance, chi-square analysis, and multiple linear regression analysis. The direction of significance could not be foreseen, therefore a two-tailed test was conducted with two levels set at .05. The research study also involved the calculation and analyzes of data of the following research questions:

1. Are there any differences in the institutional characteristics between the entry-level athletic training education programs that were initially approved by the NATA Professional Education Committee prior to the transition to CAAHEP accreditation compared to the entry-level ATEPs that were initially developed after the implementation of CAAHEP accreditation standards in 1993. Descriptive statistics and chi-square analysis was used to identify institutional differences among CAAHEP accredited ATEPs and to compare the discrete variables. The statistical results of this data are presented.

2. Are there any differences in the programmatic characteristics between the entry-level athletic training education programs that were initially approved by the NATA Professional Education Committee prior to the transition to CAAHEP accreditation compared to the entry-level ATEPs that were initially developed after the implementation of CAAHEP accreditation standards in 1993. Descriptive statistics and chi-square analysis was also used to identify institutional differences among CAAHEP accredited ATEP and to compare the discrete variables. The statistical results of this data are presented.

3. Does the first time pass percentage on the national certification examination differ between the entry-level athletic training education programs that were initially established prior to 1993 compared to the entry-level ATEPs that were initially developed after the implementation of CAAHEP accreditation standards. Descriptive statistics, t-tests and ANOVA were used to complete and to compare the means of the CAAHEP accredited ATEP developed after 1993 to those CAAHEP accredited ATEP

that have been formally established prior to the accreditation requirement. Four separate comparisons were made for each of the two groups; (1) the overall pass percentage on the certification examination, (2) the pass percentage on the written, (3) practical, and (4) written simulation component of the examination.

4. Do institutional characteristics predict an institution's first time success in passing the National Athletic Trainer's Board of Certification Examination, and if so, which institutional characteristics are statistically significant predictors for the first-time pass percentage on the national certification examination? The overall percentage for first time success in passing the national certification examination for each institution was completed. Descriptive statistics, t-test and ANOVA were used to identify institutional differences among CAAHEP accredited ATEPs, and using multiple linear regression analysis, the relationship between the national certification examination and the predictor (characteristics) variables were assessed.

5. Do programmatic characteristics predict an institution's first time success in passing the National Athletic Trainer's Board of Certification Examination, and if so, which programmatic characteristics are statistically significant predictors for the first time pass rate on the national certification examination? The overall percentage for first time success in passing the national certification examination for each institution was also completed. Descriptive statistics, t-tests and ANOVA were used to identify programmatic differences, and using multiple linear regression analysis the relationship between the national certification examination and the predictor (characteristics) variables were assessed.

Methodological Assumptions

An assumption that each ATEPs were providing athletic training education in accordance to the CAAHEP accreditation standards and guidelines since only those programs that were CAAHEP accredited and had candidate eligible to take the examination during the 1999 years were included in this study. It is also reasonable to believe that the program director from each of the institutions completed the survey with accuracy and honesty since much of the programmatic characteristic data was required to be obtained through a questionnaire survey.

Limitations

By studying the entire population (138) of academic institutions that offer CAAHEP accredited ATEPs there is strong external validity for the research study, however, there are some limitations affecting the linking power. The research design does not control variables such as individual teaching styles of the instructors, learning styles of the individual student, and the human barriers such as test anxiety and comprehension of the test questions that may exist when taking the national certification examination. The academic institutions that did not have more than five candidates take the certification examination during the year 2000 were also excluded from the study at the request of the NATABOC. A specific direction of significance was not known since this is the first time that programmatic and institutional characteristics and predictors of first time success on passing the national certification

examination was researched, therefore a non-directional test with a .05 level of significance was used.

CHAPTER IV

RESULTS

Program directors could better prepare their athletic training students for the National Athletic Trainers' Association Board of Certification Examination if they knew which institutional and programmatic variables could predict the institution's first time pass percentage on the national certification examination. It is important to investigate these characteristics to determine if the existence of certain institutional and programmatic differences among athletic training education programs affect the preparation of students for the athletic training profession. Also, it is important to inform program directors of the athletic training education programs of these programmatic characteristics and institutional differences that may enhance the quality and effectiveness in preparing students for the athletic training profession.

The purpose of this study is to determine if institutional and programmatic characteristics differ between accredited entry-level athletic training education programs that are developed prior to 1993 to those programs that were developed after 1993. Based on institutional and programmatic characteristics of the entry-level accredited athletic training education programs is it possible to predict an institution's first time pass percentage on the national certification examination. The overall percentage on the national certification examination, as well as the written, written

simulation and the practical sections of the examination for each institution was used as the criterion variables.

Survey

There were 102 questionnaires returned from athletic training education program directors for a 73.9 percent return rate. Two institutions were excluded since their questionnaires indicated that their athletic training education program received CAAHEP accreditation after January 1, 2000. A review of the ATEPs retained for the study identified 53 institutions that had established athletic training curriculums that were officially approved by the NATA Professional Education Committee. There were 47 institutions that developed and attained their initial accreditation after 1993, the year CAAHEP assumed accreditation responsibilities.

Descriptive statistics, chi-square analysis, t-test and analysis of variance were used to describe and compare the differences of the institutional and programmatic characteristics of accredited undergraduate ATEP developed prior to 1993 to those programs developed after the implementation of the CAAHEP accreditation standards.

Research Question 1

Are there any differences between the institutional characteristics of accredited undergraduate athletic training education programs developed before 1993 to those athletic training education programs developed after 1993?

The list of the institutional characteristic variables included in this investigation were: (1) Carnegie classification; (2) the College, Division or Department where the program is located; (3) total number of faculty, clinical educators, the number of full time instructors that split time between didactic and clinical assignments; (4) number of part time educators; (5) the program directors highest educational degree and their years of services; (6) and the number of students formally accepted to the programs annually.

Carnegie Classification (B1)

The differences between the Carnegie Classification of accredited undergraduate ATEPs developed prior to 1993 and those programs developed after 1993 were analyzed (Table 4). Research Extensive or Intensive institutions account for 49 percent of the ATEPs developed prior to 1993, and of the programs developed after 1993, 83.5 percent were Liberal and Masters I/II institutions. Although not statically significant, the institution's Carnegie Classification reveals a discrepancy in the percentage of research-based institutions between the two groups, $\chi^2 = 7.313$, $p = .063$.

College, Division or Department Location (B2)

The College, Division or Department where the ATEPs are located was not significantly different between the ATEPs developed prior to 1993 to those programs established afterward, $\chi^2 = 2.942$, $p = .568$. The data reveals that 64 percent of

ATEPs accredited before and after 1993 are housed in an Exercise Science or Health, Physical Education and Recreation (HPER) Department. Of the programs developed after 1993, 19 percent are located in Allied Health or Sports Medicine Departments, while 34 percent were located in an Exercise Science Department and 30 percent were located in a HPER Department (Table 5).

Table 4
Percentage of ATEPs in Relation to the Carnegie Classification*

ATEP	N	Research Extensive (n=24)	Research I Intensive (n=14)	Masters I/II (n=46)	Liberal (n=16)
Developed prior to CAAHEP Accreditation	53	32.1	17.0	41.5	9.4
Developed after CAAHEP Accreditation	47	14.9	10.6	51.1	32.4

* $\chi^2 = 7.313$, $p = .063$

Table 5
Percentage of ATEPs in Relation to Program Location*

ATEP	N	HPER (n=29)	Ex. Science (n=35)	Allied Health (n=24)	Education (n=4)	Other (n=8)
Developed prior to CAAHEP Accreditation	53	28.3	35.8	28.3	1.9	5.7
Developed after CAAHEP Accreditation	47	29.8	34	19.1	6.4	10.6

* $\chi^2 = 2.942$, $p = .568$

Athletic Training Faculty (B 3-8)

The athletic training program director's years of experience was one of the two institutional characteristics variables that did illustrate a significant difference between the CAAHEP accredited ATEPs developed before and after 1993, $\chi^2 = 16.446$, $p = .001$. The data in Table 6 indicates that 54.7 percent of the program directors of accredited athletic training education programs that were developed prior to 1993 have held the position of program director for more than ten years, compared to 17 percent that were established after 1993. The ATEPs that were developed after 1993 have 40.4 percent of the program directors with fewer than three years of experience and 72.3 percent with less than six years experience at their respective institutions.

Table 6

Program Director's Experience in Relation to Initial Accreditation*

ATEP	N	Years of Experience			
		1-3 years (n=34)	4-6 years (n=21)	7-9 years (n=8)	10+ years (n=37)
Developed Prior to CAAHEP Accreditation	53	28.3	11.3	5.7	54.7
Developed After CAAHEP Accreditation	47	40.4	31.9	10.6	17.0

* $\chi^2 = 16.446$, $p = .001$

The educational level of program directors in relation to initial accreditation, found that ATEP's developed prior to 1993 were no different than the educational level of program directors in those programs initially developed and accredited after 1993, $\chi^2 = 2.304$, $p = .316$. Fifty-two percent of all program directors are in possession of a doctorate degree.

Data presented in Table 7 indicates that the number of faculty for ATEP's that were initially developed prior to 1993 ($M = 1.6$, $SD = 1.8$) did not demonstrate significant differences compared to the ATEP's ($M = 1.8$, $SD = 1.5$) developed after 1993, $t = -.788$, $p = .433$. However, the average number of full time clinical instructors ($M = 3.7$, $SD = 3.3$) employed in ATEPs that were initially accredited prior to 1993 has demonstrated significant differences compared to the average number of full time clinical instructors ($M = 2.3$, $SD = 2.9$) in ATEPs that obtained initial accreditation after 1993, $t = 2.320$, $p = .022$. The number of full time instructors that split time between didactic and clinical assignments, or dual role educators, did not demonstrate significant differences between the CAAHEP accredited ATEPs developed prior to 1993 ($M = 2.9$, $SD = 2.9$), compared to those programs ($M = 2.1$, $SD = 2.2$) developed afterwards, $t = 1.510$, $p = .134$. The total number of part time clinical educators employed in ATEPs developed prior to 1993 ($M = 2.8$, $SD = 2.7$), did not demonstrate significant differences among those ATEPs that were developed after 1993 ($M = 2.7$, $SD = 2.9$), $\chi^2 = .158$, $p = .875$.

Thirty-four percent all of the ATEPs, report to have no full time clinical educators, 29 percent indicate to have no full time faculty, 31 percent have no dual

role educators (splits time between classroom and clinical instruction), and 25 percent have no part time educators. The total number of faculty and clinical educators were combined for each ATEP and comparisons were made that revealed athletic training education programs developed prior to 1993 ($M = 8.1$, $SD = 5.1$) retain a larger educator pool than the ATEPs that were initially established after 1993 ($M = 6.2$, $SD = 3.6$), $t(98) = 2.182$, $p = .031$.

Table 7
Average Number of Faculty and Clinical Educators Relative
to Initial Accreditation

	Prior to CAAHEP Accreditation (n=53)	After CAAHEP Accreditation (n=47)		
Faculty	Mean (SD)	Mean (SD)	t	p
Faculty	1.547 (1.814)	1.809 (1.454)	-.788	.433
Clinical Educators	3.698 (3.303)	2.255 (2.863)	2.320	.022
Dual-Role Educators	2.887 (2.853)	2.106 (2.229)	1.520	.134
Part time Educators	2.811 (2.661)	2.723 (2.917)	.158	.875
Total Faculty	8.132 (5.141)	6.170 (3.608)	2.182	.031

Athletic Training Students (B9)

The number of students admitted to an athletic training education programs is significantly different between the two groups, $t = 2.19$, $p = .031$, with a higher average number of students ($M = 17$, $SD = 7.5$) admitted annually to programs that were

developed prior to 1993 compared to the average number of students ($M = 14$, $SD = 7.0$) admitted to programs developed after 1993 (Table 8). Nineteen percent of the ATEPs that were developed after 1993 report to accept less than eight students annually, which is a threefold increase in comparison to the 6 percent of the ATEPs that were developed prior to 1993. Overall, 61 percent of the CAAHEP accredited ATEPs accept 9-16 students annually.

Table 8
Average Number of Students in Relation to Initial Accreditation

ATEP	n	Mean (SD)	t	p
Prior to CAAHEP Accreditation	53	17.189 (7.460)	2.191	.031
After CAAHEP Accreditation	47	14.000 (7.034)		

Research Question 2

Are there any differences between the programmatic characteristics of accredited undergraduate ATEP developed before 1993 and those athletic training education programs developed after 1993?

The programmatic characteristics included in the survey were separated according to the didactic, psychomotor and affective behavioral models. The didactic characteristics involve the admission standards and curriculum requirements. The psychomotor characteristics that were assessed include, (1) the structure of the clinical

experiences, (2) the athletic affiliation of the primary clinical setting and, (3) the clinical competency requirements. Affective characteristics of the ATEPs were assessed to determine if differences exist among athletic training education programs by researching what characteristics are established and practiced by clinical educators in the primary clinical setting. Descriptive statistics and Chi-square analysis were completed to compare the differences between the programmatic characteristics of accredited undergraduate ATEPs developed prior to 1993 to the programs developed and initially accredited after the 1993 implementation of the CAAHEP accreditation standards.

Didactic Variables

Admission Requirements (C1). The investigation of the differences in admission requirement found that the ATEPs developed prior to 1993 required a minimum overall grade point average less often than the programs that were developed after 1993, $\chi^2 = 4.529$, $p = .033$. All other admission requirements, GPA in core courses ($\chi^2 = 1.095$, $p = .295$), minimum course grades ($\chi^2 = 1.275$, $p = .313$), athletic training experience ($\chi^2 = .371$, $p = .542$), an interview ($\chi^2 = 2.118$, $p = .146$), and SAT scores ($\chi^2 = .219$, $p = .746$) did not demonstrate significant differences between accredited ATEPs developed prior to 1993 to those programs initially developed after 1993 (Table 9). Overall, 90 percent of the athletic training education programs did not use SAT scores, and 71 percent did not use minimum GPA in core courses as admission requirements.

Table 9

**Percentage of ATEPs that use Admission Requirements in
Relative to Initial Accreditation**

ATEP	N yes, no	Developed prior to CAAHEP Accreditation	Developed after CAAHEP Accreditation	χ^2	p
Overall GPA	83, 17	75.5	83	4.529	.033
Core GPA	29, 71	24.5	34	1.095	.295
Minimum Grade	57, 43	24.5	34	1.275	.313
AT Experience	65, 35	62.3	68.1	.371	.542
Interview	54, 46	47.2	61.7	2.118	.146
SAT Scores	10, 90	11.3	8.5	.219	.746

Curriculum Requirements (C3). Curriculum requirements were assessed to determine if any differences exist between the entry-level athletic training education programs that were developed prior to 1993 and the implementation of CAAHEP accreditation standards, to the entry-level ATEPs that were developed afterwards. A research course was required less often in ATEPs that were developed prior to 1993 than those that were initially CAAHEP accredited and implemented after 1993, $\chi^2 = 5.317$, $p = .020$. Thirteen percent of all ATEPs indicated that a research course is a curriculum requirement for their athletic training students (Table 10).

There were no significant differences between accredited ATEPs developed before 1993 to those programs developed after 1993 in the following required core courses: Pharmacology ($\chi^2 = .768$, $p = .381$), Sports Psychology/ Sociology ($\chi^2 = .010$, $p = .920$), Pathology ($\chi^2 = .008$, $p = .928$), Advanced First Aid ($\chi^2 = .013$, $p = .908$),

Nutrition ($\chi^2 = .027$, $p = .869$), Administration ($\chi^2 = .027$, $p = .870$), Therapeutic Modalities Lab ($\chi^2 = .855$, $p = .355$), and Therapeutic Exercise Lab ($\chi^2 = .524$, $p = .462$).

Table 10

Percentage of Course Requirements in Relation to Initial Accreditation

ATEP	N yes, no	Developed prior to CAAHEP Accreditation	Developed after CAAHEP Accreditation	χ^2	p
Research	13, 87	5.7	21.3	5.317	.020
Pharmacology	32, 68	35.8	27.7	.768	.381
Sport Psy/Sociology	26, 74	26.4	25.5	.010	.920
Pathology	23, 77	22.6	23.4	.008	.928
Advanced First Aid	25, 75	24.5	25.5	.013	.908
Nutrition	78, 22	77.4	78	.027	.870
Administration	71, 29	71.7	70.2	.027	.870
Modalities Lab	41, 59	45.3	36.2	.855	.355
Therapeutic Ex. Lab	78, 22	43.4	36.2	.524	.462

Psychomotor Variables

Primary Clinical Setting (C4). The affiliation of the institution's intercollegiate athletics program was investigated to determine if the primary clinical setting differs in relation to when the ATEP was initially developed. Although not statistically significant, the chi-square results shown in Table 11 indicates a difference among the ATEPs that were initially developed prior to 1993, and the athletic training education programs that were developed afterwards, $\chi^2 = 7.784$, $p = .051$. Thirteen percent of

the CAAHEP accredited ATEPs that were developed prior to 1993 had identified NCAA Division III or NAIA intercollegiate athletic athletics programs as their primary clinical experience, compared to 34 percent of those programs accredited after 1993. Collectively, 54 percent of all the ATEPs have NCAA Division I as their primary clinical experience.

Table 11
Percentage of Intercollegiate Athletic Affiliation Relative
to Initial Accreditation*

	N	NCAA I (n=54)	NCAA II (n=23)	NCAA III (n=20)	NAIA (n=3)
Prior To CAAHEP Accreditation	53	58.5	28.3	13.2	0.00
After CAAHEP Accreditation	47	48.9	17.0	27.7	6.4

* $\chi^2 = 7.784$, $p = .051$

Type of Clinical Experiences (C4). Differences were found to exist with the type of clinical experiences provided to the athletic training students, however, in relation to the ATEPs developed prior to 1993, in comparison to the ATEPs developed after the disparity was not significant, $\chi^2 = 3.012$, $p = .390$. The comparison of the types clinical experiences found 49 percent of the ATEPs assign clinical educators to supervise the athletic training students instead of assigning students to a particular sport or clinical rotation.

Clinical Competencies C6). The psychomotor clinical competencies that were surveyed did not reveal any significant differences between accredited ATEPs developed before 1993 and those programs developed after 1993 (Table 12).

Table 12

Percentage of Psychomotor Competencies in Relation to Initial Accreditation

Psychomotor Task	Prior to CAAHEP Accreditation (n=53)	After CAAHEP Accreditation (n=47)	χ^2	p
Football Experience	67.9	63.8	.666	.679
Women's Sport Experience	88.7	93.6	.389	.495
Isokinetic Dynamometer	64.2	80.9	.288	.077
Physical & Examinations	79.2	87.2	.288	.424
General Medical	49.1	44.7	.662	.692
Orthopedic Surgeon	64.2	57.4	.493	.542
Medical Documentation	96.2	95.7	.902	1.000
Emergency Review	77.4	76.6	.928	1.000
Allied Health Professionals	52.8	61.7	.371	.422
Independent Travel	75.5	74.5	.908	1.000
Independent at Practices	52.8	59.6	.498	.549
Functional Assessment	54.7	63.8	.355	.418

Programs that were developed prior to 1993 provided less access to an isokinetic dynamometer (64.2%) compared to the ATEPs that were developed after 1993 (80.9%). Less than half (47%) of all ATEPs required their students to professionally interact with a general medical physician, and 61 percent of all ATEPs required exposure to an orthopedic specialist. The total number of ATEPs that require their

students to be exposed to allied health professionals other than certified athletic trainers and team physicians were also limited to 57 percent. Approximately one-fourth of the program directors indicated that their students were not permitted to travel independently with a sports team, 44 percent did not permit their students to cover practices independently, and 41 percent did not allow athletic training students to functionally assess an athlete to determine return to play status.

Affective Characteristics (C7)

Affective characteristics were assessed based on the inclusion of specific characteristics that were contained by the clinical educator in the primary clinical setting. The affective characteristics identified in Table 13 were included in the majority of the ATEPs, with one exception; an athletic training student advisory board, which was included in 33 percent of the accredited programs. The affective characteristic variables that were surveyed did not reveal any significant differences between accredited the ATEPs developed before 1993 to those programs developed after 1993 ($p = .05$).

Table 13

Percentage of Affective Characteristics in Relation to Initial Accreditation

Affective Competency	Prior to CAAHEP Accreditation (n=53)	After CAAHEP Accreditation (n=47)	χ^2	p
SAT Manual	96.2	97.9	.630	1.000
SAT Code of Conduct	86.8	89.4	.693	.765
OSHA Exposure Plan	83.0	85.1	.776	1.000
Educational Resource	96.2	97.9	.630	1.000
Computer/Internet Access	92.5	93.6	.820	1.000
Institutional Policy	77.4	85.1	.324	.445
Grievance Procedure	88.7	78.7	.175	.274
Administrative Structure	81.1	72.3	.297	.346
Medical Referral Policy	81.1	83.0	.810	1.000
Rehabilitation Protocols	67.9	76.6	.335	.378
Student Advisory Board	28.3	38.3	.289	.394

Research Question 3

Does the first time pass rate on the national certification examination differ between accredited undergraduate ATEPs developed before 1993 to those athletic training education programs developed after 1993?

The ATEPs developed prior to 1993 were compared to the programs that were developed after 1993 in preparing candidates for the national certification examination. A t-test analysis was completed to compare the institution's first time pass percentage on the national certification examination, to include the written, practical and the written simulation sections (Table 14). The NATABOC does not permit the reporting

of test results for institutions that have less than five students taking the national certification examination during an annual reporting year, which resulted in the exclusion of 27 CAAHEP accredited athletic training programs. Overall, 73 (52.9%) of the CAAHEP accredited ATEPs surveyed were retained to compare the institutional and programmatic characteristics and the first time pass percentage on the national certification examination. Half (23) of the ATEPs that were developed and initially accredited after 1993 reported to have less than five candidates take the exam for the first time during the year 2000.

Table 14

First Time Pass Percentage for CAAHEP Accredited Athletic Training Education Programs for the Year 2000

	Prior to CAAHEP Accreditation (n=49)	After CAAHEP Accreditation (n=24)		
	Mean (SD)	Mean (SD)	t	p
Overall	47.75 (23.41)	43.77 (17.15)	.740	.462
Written	66.06 (24.61)	59.85 (19.71)	1.078	.285
Practical	75.43 (20.45)	76.86 (13.95)	-.352	.726*
Simulation	70.03 (18.71)	63.33 (15.79)	1.508	.116

*Equal variance not assumed

ATEPs developed prior to 1993 ($M = 47.75$, $SD = 23.41$), in comparison to those programs initially developed and accredited after 1993 ($M = 43.77$, $SD =$

17.15), produced a higher first time pass percentage, $t = .740$, $p = .462$, although not significant at the .05 level for the 2000 NATABOC reporting year. Consistent with the overall pass percentages, ATEPs that were developed prior to 1993 had a higher first time pass percentage on the written section ($M = 66.06$, $SD = 24.61$) of the national certification examination than those programs that were initially developed after 1993 ($M = 59.85$, $SD = 19.71$), $t = 1.078$, $p = .285$. The result were also the same for the written simulation section, where ATEPs established prior to 1993 received higher first time pass percentages ($M = 70.03$, $SD = 18.71$) on the national certification examination than those programs that were developed afterwards ($M = 63.33$, $SD = 15.79$), $t = 1.508$, $p = .116$. The practical section of the national certification examination, dissimilar from the two previous sections, revealed a lower pass percentage for the ATEPs that were developed prior to 1993 ($M = 75.43$, $SD = 20.45$), with the programs that were initially developed and accredited after 1993 ($M = 76.86$, $SD = 13.95$), $t = -.352$, $p = .726$.

Research Question 4

Do institutional characteristics predict an institution's first time pass percentage on the national certification examination, and if so; which institutional characteristics are statistically significant predictors?

The institutional variables of the ATEPs developed prior to CAAHEP accreditation requirements in 1993 to the entry-level ATEPs that were developed after

1993 were combined to compare these institutional variables to the institution's first time pass percentage on the national certification examination. The institutional characteristic variables: (1) Carnegie classification; (2) the College, Division or Department location; (3) total number of full time faculty, clinical educators, the number of full time educators that split time between didactic and clinical assignments; (4) number of part time educators; (5) the program directors highest educational degree and their years of services; (6) and the number of students annually accepted to the ATEP were included.

T-test analysis and an ANOVA were completed on the institutional characteristics and found that the College, Division or Department location of the ATEPs, $F(3, 69) = .765$, $p = .518$; the number of full time faculty, $F(7, 65) = .093$, $p = .998$; clinical educators, $F(3, 69) = .740$, $p = .532$; dual role educators on staff at the institution, $F(10, 62) = .898$, $p = .540$; the number of students admitted to the program annually, $F(3, 69) = .750$, $p = .526$; and the program director's number of years experience, $F(3, 69) = 1.193$, $p = .319$; were not significant in determining first time pass percentage on the national certification examination.

Three institutional characteristic variables were found to be significant when compared to the institution's overall first time pass percentage on the national certification examination. The Carnegie Classification of the educational institution, the number of part time educators on staff at the institutions, and the educational degree of the program director were significant in determining the first time overall pass percentage for the national certification examination.

Carnegie Classification (B1)

The athletic training education programs, grouped according to research emphasis, revealed that the Research Extensive or Research Intensive institutional classifications had a higher first time overall pass percentage on the national certification examination ($M = 54.20$, $SD = 23.20$) than the ATEPs that were sponsored by institutions classified as Masters I/II, and Liberal ($M = 43.31$, $SD = 20.19$), $t = 1.996$, $p = .050$. Research Extensive and Research Intensive institutions also had higher first time pass percentage ($M = 84.23$, $SD = 14.43$) in comparison to ATEPs sponsored by Masters I/II, and Liberal institutions ($M = 72.53$, $SD = 18.98$) on the practical section of the national certification examination, $t = 2.540$, $p = .013$. Refer to Table 15 for the t-test analysis on the first time pass percentage for CAAHEP accredited athletic training education programs in relation to the institution's Carnegie Classification. Although not significant, the ATEPs located in research affiliated institutions also reported a higher first time pass percentage on the written ($t = 1.184$, $p = .240$) and written simulation ($t = 1.547$, $p = .126$) sections of the examination.

Part Time Educators (B6)

Athletic training education programs that employ part time clinical educators were compared to the athletic training education programs that had no part time clinical educators (Table 16). Twenty-three percent of the ATEPs indicated their institution does not employ part time clinical educators. Athletic training education programs that do employ part time clinical educators ($M = 50.24$, $SD = 20.53$),

compared to those ATEPs that do not retain part time clinical educators ($M = 33.94$, $SD = 20.43$) recorded higher first time pass percentages on the national certification examination, $t = 8.223$, $p = .005$.

Table 15

First Time Pass Percentage for CAAHEP Accredited Athletic Training Education Programs Based on the Carnegie Classification

National Certification Examination	Research Extensive/ Intensive (n= 21)	Masters I/II, and Liberal (n=52)	t	p
	Mean (SD)	Mean (SD)		
Overall	54.19 (23.20)	43.31 (20.19)	1.996	.050
Written	69.06 (23.68)	61.99 (22.86)	1.184	.240
Practical	84.23 (14.43)	72.53 (18.98)	2.540	.013
Simulation	72.90 (14.81)	65.78 (18.85)	1.547	.126

Program Directors (B 8)

ATEPs who appointed program directors that possess a terminal degree ($M = 51.24$, $SD = 21.59$), in comparison to those ATEPs that appointed program directors without a terminal degree ($M = 40.63$, $SD = 20.24$), had recorded a higher first time pass percentage on the national certification examination, $t = 2.147$, $p = .035$. In addition, athletic training education programs with program directors in possession of a terminal degrees also recorded a higher first time pass percentage on the written ($t =$

1.866, $p = .066$), practical ($t = .233$ $p = .817$) and the written simulation ($t = 1.354$, $p = .180$) sections of the national certification examination (Table 17).

Table 16

First Time Pass Percentage for CAAHEP Accredited Athletic Training Education Programs Based on Part Time Clinical Educators

National Certification Examination	Part time Educators (n = 56)	No Part time Educators (n = 17)	t	p
	Mean (SD)	Mean (SD)		
Overall	50.23 (21.53)	33.94 (20.43)	8.233	.005
Written	66.00 (23.38)	57.50 (21.81)	1.777	.187
Practical	76.00 (18.93)	75.55 (17.44)	.008	.929
Simulation	69.25 (17.53)	63.14 (19.15)	1.519	.222

Primary Clinical Setting (C3)

Although recognized as a programmatic characteristic, the ATEPs primary clinical setting was included with the institutional characteristics as a predictor variables since every program director identified their University's Intercollegiate Athletic Training Room as their primary clinical setting. The primary clinical setting for the athletic training students were categorized by athletic affiliation, National Collegiate Athletic Association (NCAA) Division I; NCAA Division II; NCAA Division III; and National Association for Intercollegiate Athletics (NAIA). There was

only one institution that listed NAIA as the primary clinical affiliation and was consequently removed from the statistical analysis.

Table 17

First Time Pass Percentage for CAAHEP Accredited Athletic Training Education Programs Based on Terminal Degree of the Program Director

National Certification Examination	PhD/EdD (n =40)	MS/MA/MEd (n =33)		
	Mean (SD)	Mean (SD)	t	p
Overall	51.24 (21.59)	40.63 (20.24)	2.147	.035
Written	68.54 (20.55)	58.55 (25.22)	1.866	.066
Practical	76.36 (19.09)	75.34 (17.99)	.233	.817
Simulation	70.40 (19.03)	64.71 (17.68)	1.354	.180

A one-way analysis of variance was conducted to compare the athletic affiliation of the primary athletic training clinical setting and the institution's first time pass percentage on the national certification examination (Table 18). A difference does exist among the ATEPs that recognize their primary clinical setting as a NCAA Division I, II, or III intercollegiate athletic affiliation. Tukey's post hoc analysis was used to compare the three divisions and identified a significant differences between NCAA Division I ($M = 52.11$, $SD = 20.98$) and NCAA Division III ($M = 34.96$, $SD = 23.80$) clinical settings in producing a higher overall first time pass percentage on the national certification examination, $F(2, 69) = 3.977$; $p = .023$. No significant

difference were identified between NCAA Division I ($M = 52.11$, $SD = 20.98$) and NCAA Division II ($M = 41.28$, $SD = 17.43$) clinical settings, or any differences between NCAA Division II ($M = 41.28$, $SD = 17.43$) and III ($M = 34.96$, $SD = 23.80$) in producing a higher overall first time pass percentage on the national certification examination.

Table 18

First Time Pass Percentage for CAAHEP Accredited Athletic Training Education Programs and Athletic Affiliation of Primary Clinical Setting

National Certification Examination	NCAA D I (n =43)	NCAA D II (n =17)	NCAA D III (n = 12)	F	p
	Mean (SD)	Mean (SD)	Mean (SD)		
Overall	52.11 (20.98)	41.28 (17.43)	34.96 (23.80)	3.977	.023
Written	66.68 (24.76)	63.16 (18.14)	56.27 (24.36)	.953	.391
Practical	78.19 (16.55)	75.75 (21.29)	65.89 (18.63)	2.168	.122
Simulation	71.15 (18.10)	65.56 (17.37)	61.21 (16.43)	1.728	.185

Multiple Linear Regression for Institutional Variables

Four institutional variables produced significant differences for the ATEPs overall first time pass percentage for the national certification examination: (1) institutions classified as research extensive or intensive, (2) the employment of part time educators, (3) program directors that have obtained terminal degrees and (4) a

primary clinical setting that is recognized as a NCAA Division I. Refer to Table 19 for the first time pass percentages for these institutional variables.

Table 19

First Time Pass Percentage for CAAHEP Accredited Athletic Training Education Programs and Significant Institutional Characteristic Variables

Institutional Characteristic	Yes	No	t	p
	Mean (SD)	Mean (SD)		
Employs Part Time Educators	50.24 (20.53)	33.94 (20.43)	2.969	.005
Classified as Research Ext/Int	54.20 (20.19)	43.31 (20.19)	1.996	.050
PD has PhD or EdD	51.24 (21.59)	40.63 (20.24)	2.147	.035
Clinical Setting is NCAA I	52.11 (20.98)	38.66 (20.15)	2.708	.008

A multiple linear regression was devised to assess the predictive value of the institutional variables in determining an institution's overall first time pass percentage. The correlation matrix confirms that the institutional variables are not similar and that multicollinearity is not present (Table 20).

Descriptive statistical analyses were compiled for all of the institutional variables that were significant at the .05 level in determining ATEPs first time overall pass percentage on the national certification examination, and a linear combination of these institutional characteristics was significantly related to the institution's first time pass percentage, $F(4, 67) = 3.83$, $p = .007$. The multiple correlation coefficient for

this group of four variables was .43, indicating that approximately 19 percent of variance can be accounted for by the linear combination of these institutional predictor variables (Table 21).

Table 20

Correlation Matrix for the Programmatic Predictor Variables and the First Time Pass Percentage on the National Certification Examination

	Overall	NCAA I	Part time	Research	PD Degree
Overall	1.000				
NCAA I	.308 (.004)	1.000			
Part time	.310 (.004)	.242 (.020)	1.000		
Research	.168 (.079)	.564 (.000)	.007 (.475)	1.000	
PD Degree	.237 (.022)	.120 (.157)	.127 (.144)	.069 (.115)	1.000

Table 22 contains indices to indicate the relative strength of the individual predictors. All of the bivariate correlations between the institutional variables and an institution's first time overall pass percentage on the national certification examination were positive. The inclusion of part time clinical educators was the only institutional characteristic that was independently significant ($p = .045$). Based on the correlational analyses, it may be concluded that this group of predictor variables account for 19 percent of the variance among the first time pass percentage on the national

certification examination. The regression equation with all four predictor variables was significantly related to the institution's overall first time pass percentage, $R^2 = .19$, adjusted $R^2 = .138$, $F(4, 67) = 3.83$, $p = .007$. The regression equation to predict an institution's first time overall pass percentage on the national certification examination is as follows:

$$\text{Pass Percentage} = 9.09 \text{ (NCAA I)} + 12.17 \text{ (PT Ed)} + 1.59 \text{ (Carnegie)} + 7.74 \text{ (PD Degree)} + 26.79$$

Table 21

Multiple Regression Analysis of Institutional Characteristics in Predicting First Time Pass Percentage on the National Certification Examination

	Regression Coefficient	SE	t	p
(Intercept)	26.785	5.801	4.617	.000
Division I Affiliation	9.090	6.094	1.492	.140
Part-time Educators	12.172	5.598	2.043	.045
Research Ext./Int.	1.593	5.825	.274	.785
PD Terminal Degree	7.742	4.808	1.610	.112

Adjusted multiple $R^2 = .186$, F value = 3.834, $p = .007$

Table 22

Bivariate and Partial Correlations of the Institutional Predictors with First Time Pass Percentage on the National Certification Examination

Predictors	Correlation between each Predictor and the pass percentage	Correlation between each predictor and the pass percentage controlling all other predictors
Primary Clinical Setting is NCAA I	.31	.18
Institution Classification as Research Ext/Int	.31	.24
Employs Part Time Educators	.17	.03
Program Director has PhD or EdD	.24	.19

Research Question 5

Do programmatic characteristics predict an institution's first time pass percentage on the national certification examination, and if so; which institutional characteristics are statistically significant predictors?

The programmatic variables of ATEPs were compared to the institution's first time pass percentage on the national certification examination. The programmatic characteristics that were investigated included (1) admissions requirements, (2) curriculum requirements, (3) affiliation of the primary clinical setting, (4) clinical structure, (5) clinical competencies, and (6) affective characteristics.

Admission Requirements (C1)

Minimum cumulative GPA ($t = -.296$, $p = .768$), Core GPA ($t = -1.20$, $p = .234$), minimum grades in selected classes ($t = -.567$, $p = .573$), previous athletic training experience ($t = -.084$, $p = .933$) and SAT scores ($t = -.266$, $p = .791$) were the criteria used for this study. None of these admissions requirements were significant in predicting the first time overall pass percentage on the national certification examination. An interview required as part of the admissions process did, however, affect the first time pass percentage outcome on the practical and the written simulation sections of the national certification examination (Table 23). Dissimilar from the other variables, those athletic training programs that do not require an interview for acceptance significantly increases first time pass percentage for an institution on the practical ($t = -2.35$, $p = .021$) and the written simulation ($t = 2.36$, $p = .021$) sections of the national certification examination.

Curriculum Requirements (C2)

The types of courses that were included in the core curriculum were also investigated. Courses selected for the study involved those classes that were not considered traditional athletic training core courses, but were common requirements among CAAHEP accredited ATEPs. These courses included Research, Nutrition, Pharmacology, Sport Psychology/Sociology, Administration, Pathology, Advanced First Aid, Modalities Lab and a Therapeutic Exercise Lab. To meet the definition of a Modalities Lab and a Therapeutic Exercise Lab, the course must be defined separately

from the lecture course and additional credits awarded for the lab. There were no significant differences among the first time overall pass percentage on the national certification examination and the following required core courses: Research ($t = .063$, $p = .802$), Pharmacology ($t = .105$, $p = .747$), Sports Psychology/Sociology ($t = .225$, $p = .637$), Pathology ($t = 1.484$, $p = .227$), and Advanced First Aid ($t = .004$, $p = .952$), Nutrition ($t = .281$, $p = .598$), Administration ($t = 1.277$, $p = .262$), and Therapeutic Modalities Lab ($t = 2.706$, $p = .104$).

Table 23

**Institutions First Time Pass Percentage Based on an Interview Requirement
for Program Admission**

National Certification Examination	Interview Required (n = 39)	Interview not required (n = 34)		
	Mean (SD)	Mean (SD)	t	p
Overall	42.47 (20.64)	51.00 (21.89)	-1.71	.091
Written	59.85 (22.19)	68.81 (23.65)	-1.67	.100
Practical	71.29 (19.46)	81.19 (15.97)	-2.354	.021
Simulation	63.34 (16.44)	72.98 (18.51)	-2.36	.021

A Therapeutic Exercise Laboratory was a course that demonstrated a strong relationship with an institution's first time overall pass percentage on the national certification examination ($t = 2.080$, $p = .041$), the written section ($t = 2.252$, $p = .014$) and the written simulation section ($t = 2.029$, $p = .046$). Refer to Table 24 for t-

test analysis of the first time pass percentage for CAAHEP accredited ATEPs based on a therapeutic exercise laboratory course requirement.

Table 24

First Time Pass Percentage for CAAHEP Accredited Athletic Training Education Programs and the Requirement of a Therapeutic Exercise Laboratory Course

National Certification Examination	Therapeutic Ex. Lab (n = 29)	No Therapeutic Ex. Lab (n =44)		
	Mean (SD)	Mean (SD)	t	p
Overall	52.75 (22.36)	42.29 (20.12)	2.080	.041
Written	72.15 (24.34)	58.66 (20.94)	2.525	.014
Practical	76.48 (20.00)	75.51 (17.64)	.218	.828
Simulation	72.98 (17.91)	64.44 (17.39)	2.029	.046

Clinical Structure (C4)

The athletic training student's clinical structure was categorized into four types: (1) sports season, (2) periodic sports rotation, (3) assigned to a clinical educator and (4) the combination of the three (Table 25). The data was recoded to combine the three clinical structures that involve assignments to sports, which was then compared to the clinical educator model. ATEPs that assign their students to a designated clinical educator was not found to be significant when compared with the first time overall pass percentage on the national certification examination, $F(4, 69) = .122$, $p = .947$.

Table 25

**First Time Pass Percentage for CAAHEP Accredited Athletic Training
Education Programs and Clinical Structure**

National Certification Examination	Assigned to a Clinical Educator (n = 38)	Other than Clinical Educator (n =35)	t	p
	Mean (SD)	Mean (SD)		
Overall	47.01 (21.45)	45.83 (21.88)	.231	.818
Written	66.00 (23.70)	61.87 (22.71)	.758	.451
Practical	75.11 (19.48)	76.76 (17.57)	-.379	.695
Written Simulation	66.02 (17.46)	69.79 (18.57)	-.893	.375

Clinical Competencies (C5)

T-test analyses that were used to compare the ATEPs first time pass percentage on the national certification examination to the clinical competencies. The student's to present athletes (and injuries) to a general medical physician for evaluation and the opportunity for the student to independently perform functional assessment for safe return to physical activity following clinical competencies were found to be significant on the first time pass percentage on the national certification examination (Table 26).

Table 26

First Time Pass Percentage for CAAHEP Accredited Athletic Training Education Programs and the Required Psychomotor Competencies

		Contains the Competency	Does not Contain the Competency		
Psychomotor Competencies	N yes, no	Mean (SD)	Mean (SD)	t	p
Football experience	50, 23	45.56 (21.21)	48.37 (22.51)	.266	.608
Women's sport	65, 8	47.00 (21.55)	41.89 (22.07)	.399	.530
Physical examinations	59, 14	45.54 (21.63)	50.25 (21.83)	.540	.465
Medical documentation	70, 3	46.46 (21.80)	46.09 (16.38)	—	—
Orthopedic surgeon	44, 29	47.47 (22.04)	44.89 (20.97)	.249	.619
GM Physician	32, 41	52.54 (20.97)	41.68 (20.96)	4.822	.031
Emergency Review	54, 19	47.27 (21.93)	44.08 (20.66)	.307	.518
Allied health professionals	40, 33	43.71 (19.69)	49.75 (23.41)	1.432	.235
Isokinetic dynamometer	53, 20	47.96 (20.38)	42.41 (24.36)	.967	.329
Independent travel	52, 21	48.62 (22.15)	41.05 (19.31)	1.368	.175
Independent at practices	41, 32	47.66 (22.10)	44.88 (20.99)	.547	.586
Functional assessment	43, 30	50.61 (21.88)	40.46 (19.82)	2.025	.047

The athletic training education programs that require their students to present athletic related injuries and illnesses to a general medical physician for evaluation resulted in a higher first time overall pass percentage on the national certification examination ($M = 52.54$, $SD = 20.97$) than ATEPs that do not require this competency ($M = 41.68$, $SD = 20.96$), $t = 2.196$, $p = .031$. The practical section of the exam also demonstrated higher first time pass percentages for ATEPs that require their students to present athletic related injuries and illnesses to a general medical physician

for evaluation ($M = 82.41$, $SD = 14.11$), compared to those ATEPs that do not require this competency ($M = 70.82$, $SD = 20.00$), $t = 2.780$, $p = .007$.

Those ATEPs that provided their students exposure to a general medicine physician ($M = 68.21$, $SD = 1.93$), compared to those programs who did not ($M = 60.75$, $SD = 23.83$), also proved to be higher on the written section of the national certification examination of the higher first time pass percentage for, $t = 1.375$, $p = .174$. The written simulation portion of the national examination also reported to have higher first time pass percentage on the national certification examination for those ATEPs that provided their students exposure to a general medicine physician ($M = 72.05$, $SD = 18.07$), compared to those who did not require this competency ($M = 64.54$, $SD = 17.41$), $t = 1.799$, $p = .076$. The data for the first time pass percentage for the exposure to a general medical physician is found in Table 27.

Table 27

First Time Pass Percentage for CAAHEP Accredited Athletic Training Education Programs and Exposure to a General Medical Physician

National Certification Examination	Has exposure to a GM Physician (n = 32)	Has no exposure to a GM Physician (n = 41)	t	p
	Mean (SD)	Mean (SD)		
Overall	52.54 (20.97)	41.68 (20.96)	2.196	.031
Written	68.21 (21.93)	60.75 (23.83)	1.375	.174
Practical	82.41 (14.11)	70.82 (20.00)	2.780	.007
Simulation	72.05 (18.07)	64.54 (17.41)	1.799	.076

The three psychomotor competencies that were found to be significant required the athletic training students to complete tasks independently. Athletic training education programs that provide an opportunity for their students to travel independently with assigned sport teams ($M = 68.99$, $SD = 23.20$) have a higher first time pass percentage on the written portion of the national certification examination than programs that do not provide their students this psychomotor experience ($M = 51.71$, $SD = 18.32$), $t = 3.048$, $p = .003$. ATEPs that provide an opportunity for their students to independently cover organized sports practices ($M = 69.79$, $SD = 21.33$) also have a higher first time pass percentage on the written section of the national certification examination than programs that do not provide this competency ($M = 56.63$, $SD = 23.63$), $t = 2.495$, $p = .015$ (Table 28).

Table 28

First Time Pass Percentage for CAAHEP Accredited Athletic Training Education Programs and Independent Coverage of Sports Practices

National Certification Examination	Independent Sports Coverage (n =41)	No Independent Sports Coverage (n = 32)	t	p
	Mean (SD)	Mean (SD)		
Overall	47.66 (22.10)	44.88 (20.99)	.547	.586
Written	69.79 (21.33)	56.63 (23.53)	2.495	.015
Practical	79.19 (16.69)	71.68 (20.03)	1.748	.085
Simulation	68.87 (17.26)	66.48 (19.04)	.560	.577

ATEPs that require the their athletic training students to independently perform functional assessments on injured athletes to determine the appropriate time for a safe return to physical activity ($M = 50.61$, $SD = 21.88$), compared to those ATEPs that do not permit this activity ($M = 40.46$, $SD = 19.82$), affects the overall first time pass percentage of the national certification examination, $t = 2.025$, $p = .047$. ATEPs that require the their athletic training students to independently perform functional assessments on injured athletes to determine the appropriate time for a safe return to physical activity ($M = 70.18$, $SD = 19.50$), compared to those ATEPs that do not permit this activity ($M = 55.19$, $SD = 25.39$), also affects the first time pass percentage of the written section of the national certification examination, $t = 2.852$, $p = .006$. The data for the ATEPs first time pass percentages functional assessment is found in Table 29.

Table 29

First Time Pass Percentage of CAAHEP Accredited Athletic Training Education Programs and the Functional Assessment of Injured Athletes

National Certification Examination	Required to Perform Functional Assessment (n = 43)	Not required to Perform Functional Assessment (n = 30)	t	p
	Mean (SD)	Mean (SD)		
Overall	50.61 (21.88)	40.46 (19.82)	2.025	.047
Written	70.18 (19.50)	55.19 (25.38)	2.852	.006
Practical	78.01 (18.05)	72.86 (18.05)	1.174	.224
Simulation	70.79 (17.81)	63.58 (17.62)	1.708	.092

Affective Characteristics (C6)

The affective characteristics that are established and practiced by the clinical educators were compared to the ATEPs first time pass percentages on the national certification examination. The student advisory board and access to rehabilitation protocols were two affective variables that were not represented in over 80 percent of the athletic training programs with 32 and 33 percent, respectively (Table 30).

Table 30

Institutions First Time Pass Percentage Based on Established Affective Characteristics

Affective Competencies	N yes, no	Contains the Competency	Does not Contain the Competency	t	p
		Mean (SD)	Mean (SD)		
SAT Manual	71, 2	46.80 (21.70)	33.75 (5.30)	—	—
SAT Code of Conduct	65, 8	46.65 (21.39)	44.75 (23.95)	.055	.815
OSHA Exposure Plan	63, 10	45.86 (21.63)	50.14 (21.48)	.340	.562
Educational Resource	71, 2	46.66 (21.78)	38.75 (1.77)	—	—
Computer/Internet	67, 6	46.58 (22.03)	44.86 (15.99)	.035	.852
Institutional Policy	58, 15	46.01 (20.66)	48.10 (25.28)	.111	.740
Grievance Procedure	60, 13	45.53 (22.55)	63.49 (18.63)	.608	.438
Administrative Structure	57, 17	46.55 (23.61)	46.09 (12.89)	.006	.939
Medical Referral Policy	59, 14	47.95 (21.46)	40.10 (21.35)	1.521	.222
Rehabilitation Protocols	49, 24	47.51 (22.75)	44.05 (13.94)	.435	.512
Student Advisory Board	22, 51	46.70 (19.36)	46.33 (22.56)	.004	.947

Multiple Linear Regression for Programmatic Variables

Multiple linear regression analysis was completed on the programmatic characteristic variables to assess the predictive value in determining an institution's first time overall pass percentage for candidates that graduate from CAAHEP accredited ATEPs.

Descriptive statistical analyses were completed for all of the programmatic variables that were significant at the .05 level in determining ATEPs first-time percentage in passing the national certification examination (Table 31).

The programmatic variables also produced differences that were significant on the written, practical and written simulation sections of the national certification examination. The ability for the students to independently perform functional assessments, travel and cover practices, and the requirement for students to take a therapeutic exercise lab prove significant on the written section of the examination.

Exposure to a general medical physician and the requirement to take a therapeutic exercise laboratory for the athletic training student were significant indicators in the first time pass percentage for the practical and the written simulation portion of the national certification examination, respectively. The correlation matrix for the programmatic variables demonstrates they are not similar and that multicollinearity is not identified (Table 32).

Table 31

**First Time Pass Percentage for CAAHEP Accredited Athletic Training Education
Programs and Significant Programmatic Variables**

	Yes	No		
Variable	Mean (SD)	Mean (SD)	t	p
<u>Overall</u>				
Functional Assessment	50.61 (21.88)	40.46 (19.82)	2.025	.047
General Medical Physician	52.54 (20.97)	41.68 (20.96)	4.822	.031
Therapeutic Exercise Lab	52.75 (22.36)	42.29 (20.12)	2.080	.041
<u>Written</u>				
Therapeutic Exercise Lab	72.15 (24.34)	58.66 (20.94)	2.525	.014
Functional Assessment	70.18 (19.50)	55.19 (25.38)	2.852	.006
Independent Travel	68.99 (23.20)	51.71 (18.33)	3.048	.003
Independent Practice	69.79 (21.33)	44.87 (20.99)	2.495	.015
<u>Practical</u>				
General Medical Physician	82.41 (14.11)	70.82 (20.00)	7.731	.007
<u>Written Simulation</u>				
Therapeutic Exercise Lab	72.98 (17.91)	64.44 (17.39)	2.029	.046

Table 32

Correlation Matrix for Programmatic Predictor Variables and First Time Pass Percentage on the National Certification Examination

	Overall	Therapeutic Exercise Lab	Functional Assessment	General Medical Physician
Overall	1.000			
Therapeutic Exercise Lab	.240 (.021)	1.000		
Functional Assessment	.234 (.012)	.062 (.302)	1.000	
GM Physician	.252 (.016)	.073 (.271)	.065 (.294)	1.000

The general linear model for the programmatic characteristics also demonstrated significant differences in the first time overall pass percentage on the national certification examination, $F(3,69) = 4.62$, $p = .005$. The sample multiple correlation coefficient was .41, indicating that approximately 17 percent of the variance can be accounted for by the linear combination of these predictor variables (Table 33). This percentage is considered a large effect size and demonstrates a strong relationship among the programmatic characteristics and first time pass percentage on the national certification examination.

Table 34 contains indices to indicate the relative strength of the individual predictors. The bivariate correlations between the programmatic variables and an institution's first time pass percentage on the national certification examination were positive, with the therapeutic exercise laboratory course and independent functional

assessment as significant ($p = .05$). Based on these correlational analyses, it may be concluded that 17 percent of the variance among the first time pass percentage on the national certification examination involve programmatic predictor variables that can be easily modified or implemented.

Table 33

Multiple Regression Analysis of Programmatic Characteristics in Determining First Time Pass Percentage on the National Certification Examination

	Regression Coefficient	SE	t	p
(Intercept)	32.175	4.558	7.059	.000
Therapeutic Ex. Lab	10.395	4.820	2.157	.035
Functional Assessment	10.169	4.791	2.122	.037
General Medical	9.463	4.754	1.990	.051

*Adjusted multiple $R^2 = .167$, F value = 4.618, $p = .005$

Table 34

Bivariate and Partial Correlation of the Programmatic Predicators with First Time Pass Percentage on the National Certification Examination

Predictors	Correlation between each Predictor and the pass percentage	Correlation between each predictor and the pass percentage controlling for all other predictors
Therapeutic Exercise Lab	.24	.25
Functional Assessment	.23	.25
GM Physician	.25	.23

The regression equation with these three predictor variables was significantly related to the institution's overall first time pass percentage, $R^2 = .17$, adjusted $R^2 = .13$, $F(3, 69) = 4.62$, $p = .005$. The regression equation to predict an institution's first time overall pass percentage on the national certification examination is as follows:

$$\text{Pass Percentage} = 10.40 (\text{TherExLab}) + 10.17 (\text{Assessment}) + 9.46 (\text{GM Eval}) + 32.18$$

Written Section of the National Certification Examination

A linear combination of programmatic characteristics was significantly related to the institution's first time pass percentage on the written section of the national certification examination, $F(4, 68) = 5.89$, $p = .000$. The sample multiple correlation coefficient was .51, which indicates that approximately 26 percent of variance can be accounted for by the linear combination of these predictor variables. Refer to Table 35 for the correlation matrix for the programmatic predictor variables.

The multiple regression analysis combined the psychomotor competencies that were significant: (1) a therapeutic exercise laboratory, (2) the ability to functionally assess injured athletes, (3) independent coverage of practice and (4) independent travel to determine the 25.7 prediction percentage. The effect size demonstrates a strong relationship between the combined variables and an institution's first time pass percentage on the written portion of the national certification examination. Refer to Table 36 for the multiple regression analysis of the programmatic characteristics and the first time pass percentage on the written section of the national certification examination.

Table 35

Correlation Matrix for Programmatic Predictor Variables and First Time Pass Percentage on the Written Section of the National Certification Examination

	Overall	Therapeutic Exercise	Functional Assessment	Independent Travel	Independent Practice
Overall	1.000				
Therapeutic Exercise Lab	.287 (.007)	1.000			
Functional Assessment	.321 (.003)	-.062 (.302)	1.000		
Independent Travel	.340 (.002)	.207 (.040)	.146 (.109)	1.000	
Independent Practice	.284 (.007)	-.016 (.446)	.384 (.000)	.475 (.000)	1.000

Table 36

Multiple Regression Analysis of Programmatic Characteristics and First Time Pass Percentage on the Written Section of the National Certification Examination

	Regression Coefficient	SE	t	p
(Intercept)	41.913	5.271	7.952	.000
Therapeutic Exercise Lab	12.357	5.072	2.436	.017
Functional Assessment	12.813	5.304	2.416	.018
Independent Travel	10.435	6.227	1.676	.098
Independent Practice	3.949	5.941	.665	.508

*Adjusted multiple $R^2 = .257$, F value = 5.891, $p = .000$

Table 37 contains indices to indicate the relative strength of the individual predictors. All of the bivariate correlations between the programmatic variables and an institution's first time pass percentage on the written section of the national certification examination were positive, with therapeutic exercise laboratory and independent functional assessment as significant ($p < .05$). Based on these correlational analyses, it may be concluded that 26 percent of the variance among the first time pass percentage on the national certification examination involve these four programmatic predictor variables.

Table 37

Bivariate and Partial Correlation of the Programmatic Predictors with First Time Pass Percentage on the Written Section of the National Certification Examination

Predictors	Correlation between each Predictor and the pass percentage	Correlation between each predictor and the pass percentage controlling for all other predictors
Therapeutic Exercise Lab	.29	.28
Functional Assessment	.32	.28
Independent Travel	.34	.20
Independent Practice	.28	.08

The regression equation with all four predictor variables was significantly related to the institution's first time pass percentage on the written section of the national certification examination, $R^2 = .26$, adjusted $R^2 = .21$, $F(4, 68) = 5.89$, $p = .000$. The regression equation to predict an institution's first time pass percentage on written section of the national certification examination is as follows:

Pass Percentage (Written) = 12.36 (*TherExLab*) + 12.81 (*Assessment*) + 10.44 (*Travel*) + 3.95
(travel) + 41.91

Practical Section of the National Certification Examination

A linear regression analysis was conducted to evaluate the prediction of the practical section of the national certification examination to the student athletic trainers' exposure to a general medical physician. The opportunity for students to be exposed to a general medical physician has a positive effect on the institution's first time pass percentage on the practical section of the national certification examination. Approximately 10 percent of the variance of the practical portion of the national certification examination was accounted for by its linear relationship with student exposure to a general medical physician (Table 38).

Table 38

Regression Analysis of Programmatic Characteristics in Predicting First Time Pass Percentage on the Practical Section of the National Certification Examination

	Regression Coefficient	SE	R ²	t	p
(Intercept)	70.817	2.760			
General Medical	11.590	4.168	.098	2.780	.007

The regression equation for exposure to a general medical physician predictor variables was significantly related to the institution's first time pass percentage on the

practical section of the national certification examination, $R^2 = .10$, adjusted $R^2 = .09$, $t(71) = 2.780$, $p = .007$. The regression equation to predict an institution's first time pass percentage on the practical section of the national certification examination is as follows:

$$\text{Pass Percentage (Practical)} = 11.59(\text{GM Evaluation}) + 70.82$$

Written Simulation Portion of the National Certification Examination

A linear regression analysis was conducted to evaluate the prediction of first time pass percentage on the written simulation section of the national certification examination to a therapeutic exercise laboratory. The opportunity for students to be required to take a therapeutic exercise laboratory has a positive effect on the institution's first time pass percentage on the written simulation portion of the national certification examination. Approximately 5.5 percent of the variance of the written simulation section of the national certification examination were accounted for by its linear relationship with students who were taking a therapeutic exercise laboratory. Refer to Table 39 for the regression analysis of programmatic characteristics in predicting first time pass percentage on the written simulation section of the national certification examination.

The regression equation for a therapeutic exercise laboratory predictor variables was significantly related to the institution's first time pass percentage on the written simulation section of the national certification examination, $R^2 = .06$, adjusted $R^2 = .04$, $t(71) = 4.12$, $p = .046$. The regression equation to predict an institution's

first time pass percentage on the written simulation section of the national certification examination is as follows:

$$\text{Pass Percentage (Written Simulation)} = 8.54(\text{Therapeutic Ex Lab}) + 64.44$$

Table 39

Regression Analysis of Programmatic Characteristics in Predicting First Time Pass Percentage on the Written Simulation Section of the National Certification Examination

	Regression Coefficient	SE	R ²	t	p
(Intercept)	64.435	2.653			
Therapeutic Exercise	8.541	4.209	.055	4.118	.046

Multiple Linear Regression for all of the Predictor Variables

The institutional characteristics: (1) Research Intensive or Research Extensive Institutions, (2) NCAA Division I athletic affiliated primary clinical sites, (3) part time clinical educators, and (4) program directors that possess a terminal degree were found to be significant when compared to the institution's first time pass percentage on the on the national certification examination ($p < .05$). The programmatic variables that were found to be related to the institution's first time pass percentage on the national certification examination included: (1) the core course requirement to take a therapeutic exercise lab, (2) the ability for the students to independently perform functional assessments, and (3) exposure to a general medical physician. A multiple

regression analysis was conducted to determine the strength of these institutional and programmatic characteristics as predictors of institutions first time pass percentage on the national certification examination. Refer to Table 40 for the significant institutional and programmatic characteristics and the first time pass percentage on the national certification examination.

Table 40
First Time Pass Percentage for ATEPs Significant Institutional and Programmatic Characteristic Variables

Variable	Yes	No	t	p
	Mean (SD)	Mean (SD)		
Research Extensive/Intensive	54.19 (23.20)	43.31 (20.19)	1.996	.050
Division I Athletic Affiliation	52.11 (20.98)	38.66 (20.15)	2.708	.007
Part-Time and GA Instructors	50.23 (21.53)	33.94 (20.43)	2.969	.005
PD Terminal Degree	51.24 (21.59)	40.63 (20.24)	2.147	.035
Functional Assessment	50.61 (21.88)	40.46 (19.82)	2.025	.047
General Medical Physician	52.54 (20.97)	41.68 (20.96)	4.822	.031
Therapeutic Exercise Lab	52.75 (22.36)	42.29 (20.12)	2.080	.041

Bivariate coefficients among the predictor variables were completed to reveal that the variables were not corrupted by multicollinearity and to assess any individual variable significance (Table 41).

Table 41

Correlation Matrix for Institutional and Programmatic Predictor Variables and First Time Pass Percentage on the National Certification Examination

	OVERALL	NCAA I	PT	Research	PD Degree	Ther Ex Lab	Funct Assess	GM Phys.
OVERALL	1.000							
NCAA I	.308 (.004)	1.000						
PT Educator	.310 (.004)	.242 (.020)	1.000					
Research Classification	.168 (.079)	.564 (.000)	.007 (.475)	1.000				
PD Degree	.237 (.022)	.120 (.157)	.127 (.144)	.069 (.283)	1.000			
Therapeutic Ex Laboratory	.232 (.025)	-.018 (.439)	.167 (.081)	-.051 (.336)	.051 (.336)	1.000		
Functional Assessment	.246 (.019)	-.062 (.302)	-.113 (.172)	.076 (.264)	.208 (.040)	-.053 (.330)	1.000	
GM Physician	.269 (.011)	.142 (.117)	.262 (.013)	.069 (.282)	.100 (.201)	.087 (.235)	.052 (.332)	1.000

A linear combination of institutional and programmatic characteristics displayed a significant relationship to the institution's first time pass percentage, $F(7, 64) = 4.136$, $p = .001$. The multiple correlation coefficient for this group of variables was .56, indicating that approximately 31 percent of variance can be accounted for by the linear combination of these predictor variables (Table 42).

Table 42

Multiple Regression Analysis of Institutional and Programmatic Characteristics in Predicting First Time Pass Percentage on the National Certification Examination*

	Regression Coefficient	SE	t	p
(Intercept)	17.018	6.256	2.720	.008
NCAA Division I	10.817	5.792	1.868	.066
Part Time Educators	10.112	5.869	1.723	.090
Research Classification	2.932E-02	5.523	.005	.954
Program Director's Degree	4.442	4.659	.954	.344
Therapeutic Ex. Lab	8.767	4.615	1.139	.062
Functional Assessment	11.514	4.713	2.443	.017
General Medical Phys	6.082	4.694	1.296	.200

*Adjusted multiple $R^2 = .311$, $F = 4.136$, $p = .001$

Table 43 contains indices to indicate the relative strength of the individual predictors. All of the bivariate correlations between the institutional and programmatic variables and an institution's first time pass percentage on the national certification examination were positive. Institutions that provide their students an opportunity to functionally assess athletes was the only predictor variable that was significant ($p = .017$). Based on these analyses, it may be concluded that this group of predictor variables account for 31 percent of the variance among the first time pass percentage on the national certification examination. The regression equation with all institutional and programmatic predictor variables was significantly related to the institution's first

time overall pass percentage on the national certification examination, $R^2 = .31$, adjusted $R^2 = .24$, $F(7, 64) = 4.14$, $p = .001$.

Table 43

Bivariate and Partial Correlation of the Predictors with First Time Pass Percentage on the National Certification Examination

Predictors	Correlation between each Predictor and the pass percentage	Correlation between each predictor and the pass percentage controlling for all other predictors
NCAA Division I	.31	.23
Part Time Educators	.31	.21
Research Classification	.17	.00
Program Director's Degree	.24	.12
Therapeutic Ex. Lab	.23	.23
Functional Assessment	.25	.29
GM Physician	.27	.16

The regression equation to predict an institution's overall first time pass percentage on the national certification examination is as follows:

$$\text{Pass Percentage (Overall)} = 10.82 \text{ (NCAA I)} + 10.11 \text{ (PT)} + 2.93 \text{ (Carnegie)} + 4.44 \text{ (PD Degree)} + 8.77 \text{ (Ther Ex Lab)} + 11.51 \text{ (Assessment)} + 6.08 \text{ (GM Eval)} + 17.02$$

CHAPTER V

SUMMARY, DISCUSSION AND CONCLUSIONS

Summary

The purpose of this study was to investigate the institutional and programmatic characteristic differences of Athletic Training Education Programs that were developed prior to 1993 to the ATEPs that were developed afterwards, and to determine if any variables exist that are statistically significant predictors for determining an institution's first time pass percentage on the NATA Board of Certification Examination. The overall national certification examination percentage, as well as the written, practical, and the written simulation sections for each institution was used as the criterion variables for the institutional and programmatic characteristics.

The Statistical Package for the Social Sciences® statistical program (version 10.0, SPSS, Inc., Chicago, IL) was used to calculate the chi-square analysis, t-test for independent samples, ANOVA, and multiple linear regression using a two-tailed test set at a .05 significance level. The research study also involved the calculation and analyzes of data of the following research questions:

1. Are there any differences between the institutional characteristics of accredited undergraduate ATEP developed before 1993 to those programs developed after 1993?

2. Are there any differences between the programmatic characteristics of accredited undergraduate ATEP developed before 1993 to those programs developed after 1993?

3. Does the first time pass rate on the national certification examination differ between accredited undergraduate ATEP developed before 1993 to those programs developed after 1993?

4. Do institutional characteristics predict a candidate's first time success in passing the national certification examination, and if so; which institutional characteristics are statistically significant predictors for the first-time pass percentage on the national certification examination?

5. Do programmatic characteristics predict a candidate's first time success in passing the National Athletic Trainer's Board of Certification Examination, and if so; which programmatic characteristics are statistically significant predictors for the first time pass percentage on the national certification examination?

Four separate comparisons were made for each of the two groups; (1) the overall pass percentage on the certification examination, (2) the pass percentage on the written, (3) practical, and (4) written simulation sections of the examination.

The institutional and programmatic characteristics of athletic training education programs that was developed prior to 1993, in comparison to the ATEPs that were developed afterwards identified six variables that were significantly different: total number of full time faculty, clinical educators, and students; the program director's years of experience; minimum GPA as an admission requirement and a research course

requirement. The differences that exist among ATEPs are not the same variables that are significant in relation to the first time success on the national certification examination. The institutional and programmatic characteristics included in this research were 49 different variables, of which, 80 percent were not identified as significant predictors of an institution's first time pass percentage on the national certification examination. The year the ATEP was developed, program location, the number of full time faculty, the number of clinical educators, the program director's years experience, the number of students annually accepted, most of the admissions requirements, the course curriculum requirements, the clinical structure and all of the affective characteristics were variables that did not result in significant differences in the institution's first-time pass percentage.

Nine of the variables did prove to be significant determinates in the institution's first time pass percentage, of which, a therapeutic exercise laboratory course, exposure to general medical physicians, part-time clinical educators, and the program director with a doctorate degree, are variables that could be revised. Also, providing independent decision-making activities as traveling with a sports team, covering sports practices and completing functional assessments to determine an athlete's return to participation are variables that were found to be significant in determining an institution's first time pass percentage on the national certification examination and should be included in the athletic training student's psychomotor experience.

The Carnegie "Research" Classification and the NCAA Intercollegiate Athletic Affiliation were two variables that were beyond the control of the program directors.

Institution's that identify their primary clinical site as NCAA Division I and has a Carnegie Classification of Research Extensive or Research Extensive were related to the institution's first time pass percentage on the national certification examination. Further investigation regarding these two uncontrollable variables need to explore the association of resources to determine if these characteristics are associated with other significant variables that could be controlled or revised.

Discussion

The athletic training education programs that were included in this study totaled 100 of the 138 that were surveyed (72.5%), with 53 institutions identified as athletic training curriculums initially approved by the NATA Professional Education Committee prior to 1993, and 47 athletic training programs identified as new programs that gained initial accreditation after 1993. The NATABOC does not permit the reporting of test results for the institutions that have less than five students taking the national certification examination during an annual reporting year. Consequently, 27 CAAHEP accredited athletic training programs were excluded when comparing the institutional and programmatic characteristics to the national certification examination. Interestingly, the ATEPs that were initially developed and accredited after 1993 reported 23 of their accredited programs to have less than five first time candidates actually take the national examination during the year 2000.

The average number of students taking the national certification examination for ATEPs developed after 1993 reveals a disparity that may be related to the lower

number of students accepted each year to these programs, $t = 2.19$, $p = .031$, and that 19.1 percent of these ATEPs accept less than eight students annually, a percentage that is three times higher than the programs that were developed prior to 1993. A relationship to the size of the institution and enrollment of athletic training students may exist since 83.5 percent of the ATEPs initially accredited after 1993 were sponsored by Masters I, II and Liberal Arts Colleges and Universities.

When compared to the ATEPs initially developed and accredited prior to 1993, the ATEPs that were developed afterwards produced a lower pass percentage on the national certification examination and all three sections of the exam. This difference in pass percentages for the 2000 NATABOC reporting year was not determined to be significant, though more research is indicated.

Strong relationships were found to exist among certain institutional and programmatic characteristics and the institution's first time pass percentage on the national certification examination. When the significant ($p < .05$) institutional and programmatic variables were combined, a 31.1 prediction percentage for the first time pass percentage on the national certification examination was present.

Institutional Characteristics

The Carnegie Classification of Institutions of Higher Education defines institutions in the United States by their degree-granting activities. Institutional characteristics did not demonstrate significant differences between the two levels of CAAHEP accredited ATEPs ($p \geq .063$). However, ATEPs that are based in Research

Extensive or Research Intensive institutions reported a greater first time pass percentage on the national certification examination ($t = 1.996$, $p = .050$) and the practical section of the examination ($t = 2.540$, $p = .03$). Sixty percent of the ATEPs developed prior to 1993 were identified by the Carnegie Classification of Educational Institutions as Liberal and Masters I/II institutions, compared to an 83.5 percent for the programs developed after 1993, a 32.6 percent disparity. ATEPs that were initially developed and accredited after 1993 are located more often in Colleges and Universities with lower student enrollment, and since these ATEPs are also accepting lower numbers of students to their programs, there are less students eligible to take the examination. Lower student enrollment, however, does not completely explain why 23 of these institutions had less than five candidates take the national certification examination.

Intercollegiate Athletic Affiliation

All of the surveys received from the program directors indicated that the institution's Intercollegiate Athletics Department was the primary site for the athletic training students' clinical experience, of which, 54 percent have an NCAA Division I affiliation. The ATEPs that recognized NCAA Division I as a primary clinical setting demonstrated a significantly higher first time pass percentage on the national certification examination ($df = 2, 69$; $F = 3.977$; $p = .023$) as compared to NCAA Division III clinical settings. It is important that program directors and clinical coordinators recognize the differences that exist among intercollegiate athletic

programs and the impact on the athletic training students' clinical experience. ATEPs that identify their primary clinical setting as NCAA Division III needs to ensure that each student is provided with clinical experiences that meet the required standards and guidelines as established by CAAHEP. Also, with the elimination of the internship as a route to certification, 50 additional NCAA Division III athletic affiliated institutions have indicated their intentions to develop CAAHEP accredited ATEPs (CAAHEP, 2002). Program directors need to identify the strengths and the deficiencies their primary clinical setting would have on the student's clinical experience and institute an educational model that ensures students a quality psychomotor experience.

Denegar (1997), identified the need for a more diverse clinical experience for the athletic training student other than the experiences obtained at the intercollegiate athletic setting since sports medicine clinics and high school settings are the primary employment opportunities for the entry-level certified athletic trainer. The majority of the ATEPs offers their students clinical opportunities at affiliated sites at the high school and clinical level, but all recognized their intercollegiate athletic department as their primary clinical site. Although it is recognized that a more diverse clinical experience would better prepare students for an entry-level position, more research needs to be completed to determine which affiliated sites best prepares the student for the NATA Board of Certification Examination.

Faculty and Clinical Educators

Athletic training education programs that were established prior to 1993 have an average total of 8 full time faculty and clinical educators compared to 6 for those ATEPs developed after 1993 ($p = .031$). ATEPs that were initially developed prior to 1993 also average 1.4 clinical educators ($p = .022$). Again, the differences between the ATEP's that were developed prior to 1993 and those developed afterwards appear to be related to the lower number of students accepted and eventually eligible to take the national certification examination in ATEPs located in institutions with a lower student enrollment. The study also reported that 29 percent of ATEPs reported to have no full time faculty, and 34 percent reported to have no full-time clinical instructors. The study also found that 69 percent of the programs depend on educators that divide their time between classroom teaching and clinical education, with 75 percent utilizing part time clinical educators. Although differences do not exist among athletic training programs established before and after 1993, comparisons to other allied health professions needs to be studied to determine if the large disparity of first time pass percentages among allied health professions is related to the limited number of full time teaching faculty and clinical educators.

The employment of part time educators proved to be a significant characteristic that was related to an institution's first time pass percentage on the national certification examination. Comparisons among ATEPs found that the programs who employ part time clinical educators have a greater first time pass percentage on the national certification examination ($t = 8.223$, $p = .005$). The typical part time clinical

educator is a graduate of an entry-level ATEP and a recent certified athletic trainer that has accepted a graduate assistantship or an internship position at the College or University to work in the intercollegiate athletic department or an affiliated clinical site. The part time clinical educator can provide important information to athletic training students, specifically, suggestions in how to prepare for the national certification examination. Full time clinical educators or faculty members may rely more on the competency-based objectives required of an entry-level athletic trainer and perhaps refer students to the Role Delineation Study (1999) and the athletic training study guides that are commercially available. The part time clinical educators, comparatively, may be able to provide a more reliable and recent self-account of the examination process.

Athletic training education programs that have hired program directors with doctorate degrees recorded a higher first time pass percentage on the national certification examination ($t = 2.147$, $p = .035$), but no relationship appears to exist with the program director's years of experience ($t = 1.193$, $p = .319$). Program directors that are in the possession of a doctorate degree are more likely to be recognized as full time tenure-track faculty, less likely to be involved in the day-to-day clinical instruction of students, required to perform administrative tasks within the intercollegiate athletics department. Full time faculty can also dedicate more time to the specific educational needs of the program, are given greater access to educational resources offered by the College and University, and contribute to professional organizations (Sammarone-Turocy, et al. 2000).

The initiative to encourage institutions to align their ATEPs with allied health professional programs appear unproductive with 64 percent of all CAAHEP accredited ATEPs housed in an Exercise Science or HPER Department (Starkey, 1998). CAAHEP accredited ATEPs that were developed after 1993 reflect a continued alignment with Exercise Science and HPER Departments with only 19.1 percent of the CAAHEP accredited ATEPs developed after 1993, aligning their programs with an Allied Health or Sports Medicine Department. The College or Department location did not impact an institution's first time pass percentage on the national certification examination, ($t = .602$, $p = .549$).

The institutional characteristics that demonstrated significant differences in the institution's first time pass percentage on the national certification examination involves: (1) a research-based institution, (2) an NCAA Division I intercollegiate athletics program, (3) a program director that has completed a terminal degree, and (4) the hiring of part time clinical educators. An 18.6 prediction percentage for these institutional characteristics reflect strong impact on the institution's first time pass percentage for the national certification examination. An institution's research classification and intercollegiate athletics affiliation are variables that cannot be changed, and although providing an advanced degree and the opportunity to hire part time clinical educators are possible, revisions would necessitate additional financial resources and significant programmatic revisions.

Programmatic Characteristics

Every ATEP involved in this study indicates that an admission to their program is selective and that a student selection process has been established to determine eligibility standards. The limited number of student accepted to ATEP's appears to be consistent with the eight to one ratio of students to certified athletic trainers that are designated as clinical educators and that is recommended by CAAHEP (2002). Grade point average (cumulative and core), minimum grade in selected classes, an interview, previous athletic training experience and scores on the SAT were the criteria used for admission in this study. None of these admissions standards were significant in predicting the first time pass percentage on the national certification examination ($p \geq .091$). Half of the ATEPs required an interview as an admission requirement, however, it appears to be negatively related to the first time pass percentage on the practical and the written simulation portion of the national certification examination. The institutions that require their students to complete an interview for admission to the athletic training program had a significantly lower percentage on the national certification examination, as well as the practical and written simulation sections of the examination. Dissimilar from the other programmatic and institutional variables, those programs that do not require an interview for acceptance to the ATEP had a significantly better first time pass percentage.

The investigation of the admission requirements found that ATEPs established prior to 1993 required a minimum overall grade point average less often than those programs that were implemented after the introduction of CAAHEP accreditation

requirements ($\chi^2 = 4.529$, $p = .033$). This trend may be a result of recent studies that identify GPA as a significant indicator of a candidates first time pass success on the national certification examination (Draper, 1989; Harrelson et al., 1997; Middlemas, 1999; Middlemas, Manning, Gazillo & Young, 2001; Sammarone-Turocy, et al., 1999; Williams, 1998). Based on this research study, ATEPs that require a minimum GPA as a prerequisite did not indicate a higher first time pass percentage on the national certification examination ($p = .768$).

The Scholastic Aptitude Test was not an admission requirement in 90 percent of the ATEPs and was not significant in predicting an institutions first time pass percentage. Standardized test scores are used by institutions as a preadmission criterion for acceptance to the College or University, and since this research identified less than ten ATEPs that admit students as freshman, SAT scores were not emphasized. The majority of the programs admit students to the athletic training program either the sophomore or junior year. and while standardized scores may influence whether a student was accepted to the institution, it was not a factor in determining program admissions.

Course Requirements

The courses that were investigated for this study involved classes that included competencies from the athletic training content areas but were not consistently included in athletic training curriculums across the country. Courses that emphasize Research, Nutrition, Pharmacology, Administration, Sport Psychology/Sociology,

Pathology, Advanced First Aid, Modalities Laboratory and a Therapeutic Exercise Laboratory were analyzed. Other athletic training courses such as; First Aid, Introduction to Athletic Training, Athletic Training Techniques, Athletic Injury Evaluation, Therapeutic Exercise and Therapeutic Modalities were considered traditional core courses for athletic training majors and were not included in the study.

The revised competencies for athletic training education programs that were approved in 1999 and are required of all CAAHEP accredited ATEPs for the 2002-2003 academic year contains expanded content areas and additional competencies. The existing competency domain entitled “Management, Treatment, and Disposition” has been split into five separate content areas: Acute Care, Pathology, General Medical Conditions and Disabilities, and Nutrition. A large number of the ATEPs do not require a Pathology (76%), Advanced First Aid (75%) and Pharmacology (68%), with this increase in the number of clinical competencies in the Management, Treatment, and Disposition domain one would speculate that the ATEPs will be forced to revamp their existing curriculum (NATA, 1999).

One course, Therapeutic Exercise Laboratory, was found to be significant in the prediction of an institution’s first time pass percentage on the national certification examination. A therapeutic exercise course is found in virtually every ATEP since the rehabilitation of athletic injuries has been an essential domain in athletic training education. Although a therapeutic exercise course is common to ATEP curricula, only 39.7 percent offer a lab concurrently in such a way that separate credit is given. The ATEPs that require a therapeutic exercise laboratory course for credit recorded a

higher first time pass percentage on the national certification examination ($t = 2.080$, $p = .041$), the written portion ($t = 2.252$, $p = .014$) and the written simulation portion ($t = 2.029$, $p = .046$). This study supports the need for additional instruction in the therapeutic exercise content area, but ATEPs may be forced to include other courses that will focus on the new content areas that are also underrepresented.

Psychomotor Characteristics

The focus of the research is to provide program directors with a list of practical recommendations to improve their athletic training education programs that is based on the identification of variables that influence the institution's first time pass percentage on the national certification examination. Exposure to a general medical physician, the ability to functionally test injured athletes, and a therapeutic exercise laboratory requirements are the three programmatic characteristic identified as variables that could be easily changed or modified.

The three psychomotor competencies that were found to be significant require athletic training students to independently complete psychomotor tasks. The ATEPs that provide opportunity for the athletic training students to travel independently with assigned sport teams ($t = 3.048$, $p = .003$) and to cover organized sports practices ($t = 2.495$, $p = .015$) found to have a significantly better first time pass percentage on the written portion of the national certification examination. The opportunity for athletic training students to perform independent functional assessments on athletes in order to determine appropriate return for participation is significantly correlated to the ATEPs

first time pass percentage on the national certification examination, $t(72) = 2.852$, $p = .006$. Athletic training students that are given the opportunity to travel, cover practices and permitted to perform functional assessments describes clinical conditions that spur decision-making activities. The ability for students to assume a degree of responsibility in the treatment and the rehabilitation process of the athletes and are given a certain amount of autonomy appears to be important in obtaining proficiency in psychomotor competencies.

One-fourth of all ATEPs restricts the athletic training student from traveling independently with an athletic team. Forty-four percent of the ATEPs do not permit athletic training students the opportunity to cover practice independently and 41 percent of the ATEPs do not permit the student athletic trainer to perform functional tests on athletes in order to determine full return to athletic activity. Limitations to independent decision-making activities appear to adversely affect the athletic training student's clinical education. Interpretations of the CAAHEP standards and guidelines have contributed to the recent trend of ATEPs restricting the duties and responsibilities of the athletic training students. Independent travel and coverage of practices have not been prohibited from the athletic training student's clinical experiences, rather, specific psychomotor tasks have been redefined to ensure that students are not placed into situations that they are not qualified. It is important to eliminate the dependence for athletic training students as a workforce in the intercollegiate athletics department but it is equally important that the student's role does not compromise the quality of the clinical experience. Program directors and

clinical educators need to ensure that each athletic training student is provided with decision-making opportunities and a certain degree of independence that contains a careful balance between supervision, clinical education and independent psychomotor experience.

The athletic training student's exposure to women's sports experiences was not identified as significant predictors of an institution's first time pass percentage; however, this psychomotor characteristic is a requirements for CAAHEP accreditation. Nine percent of the ATEPs do not require their athletic training students to be exposed to a clinical experience that contains women's sports, an CAAHEP accreditation standard that is defined as an essential clinical experience. Fall football is the most common equipment intensive and collision sports offered by NCAA intercollegiate athletics programs, yet 34 percent of the ATEPs do not require their athletic training students to experience football during the fall sports season.

Less than half (47%) of the ATEPs do not require their students to professionally interact with a general medical physician, and 39 percent of the ATEPs do not require exposure by professional interaction with an orthopedic specialist. Exposure to a general medical physician appears to be more critical than with an orthopedic surgeon when predicting an institution's first time pass percentage. The athletic training programs that require their students to present athletic related injuries and illnesses to a general medical physician for an evaluation and diagnosis resulted in a higher pass percentage on the national certification examination ($t = 2.025$, $p = .047$) and the practical portion ($t = 2.852$, $p = .006$) of the examination. Program directors need to

collaborate with the staff athletic trainers and clinical educators located in the primary clinical setting to create reasonable exposure to a general medical physician. Since 83 percent of the ATEPs require their students to participate with the screenings and physical examinations, one suggestion is to introduce this psychomotor competency by assigning the athletic training students to a shadowing experience with general medical physicians during the annual preseason screenings and physical examinations.

Athletic Training Primary Clinical Setting and Clinical Models

The type of clinical experience provided to the athletic training student was categorized into (1) sports season, (2) periodic sports rotation, (3) being assigned to a clinical educator and (4) the combination of the three. Consistent with the interpretation of CAAHEP accreditation standards, 49 percent of all ATEPs assign clinical educators to supervise the athletic training students instead of assigning students to a particular sport or sports rotation (CAAHEP, 2002). This, however, does not indicate that the other ATEPs do not provide appropriate supervision and psychomotor education that is consistent with the CAAHEP standard Ibc(2)(a). There was also no significant findings regarding the ATEPs type clinical structure and the first time pass percentage on the national certification examination ($F = .122$, $p = .947$). It is important to note these results since a revision to the CAAHEP standards and guidelines suggests that ATEPs shall assign athletic training students to clinical educators, not to a specific sport or clinical assignment.

The traditional setting for the certified athletic trainer is to be employed in high schools, colleges and the professional sports setting. As the profession emerges and expands to service a physically active general population, the majority of certified athletic trainers are hired to work in sports medicine clinics and other non-traditional work sites. The need to expose the athletic training student to high school and clinical experiences is warranted since 80 percent of the entry-level certified athletic trainers were hired to work in sports medicine clinics or in the high school setting (Denegar, 1997). The research data submitted by the program directors that responded to the survey have indicated that the institution's intercollegiate athletics department was the primary clinical site to obtain athletic training experience. There is concern that institutions that sponsor ATEPs rely too much on the athletic training students as a labor force rather than providing an appropriate number of certified athletic trainers to service the intercollegiate athletic department. Suggestions to develop a new model, or to adopt a model similar to what is used by medical and physical therapy schools for clinical education was recommended (Denegar, 1997). The recommendation to emphasize only one specific clinical model is not supported. Researchers recommend that clinical education include non-technical competencies such as communication, collaboration and reflective practice, and to also use various models in the clinical education of students (Stroschein, Hagler and May, 2002). It is important that programs directors and clinical coordinators assess their primary clinical sites and affiliated settings to determine what clinical model best fits the clinical experience and then select an appropriate clinical model for that particular site.

Conclusions

Based on the collection and the analysis of data, the following conclusions were drawn:

1. The first time pass percentage on the national certification examination and the individual sections was not significant for the 2000 NATABOC reporting year for those ATEPs developed prior to 1993 compared to those developed after 1993. The study was limited to 24 ATEPs developed after 1993 since 23 of the 47 institutions surveyed had less than five students take the exam during the 2000 NATABOC reporting period, and 49 ATEPs developed before 1993.
2. Students from athletic training education programs that have hired program directors with doctorate degrees recorded a higher first time pass percentage on national certification examination, however, a relationship does not appear to exist with the program director's years of experience.
3. The total number of faculty and clinical instructors for athletic training education programs that were developed prior to 1993 reveals a larger educator pool than the ATEPs that were initially developed after 1993.
4. The number of students admitted to athletic training education programs is significantly different among the two groups with an average of 17 students admitted annually to programs that were established prior to 1993 compared to an average of 14 students for ATEP established after the implementation of CAAHEP accreditation standards.

5. Athletic training education programs that employed part time educators demonstrated a greater first time pass percentage on the national certification examination when compared to the programs that had no part time educators.

6. Institutions that require their students to complete an interview prior to admittance to the athletic training program had significantly lower percentage on the national certification examination; and on the practical and written simulation portion of the national certification examination.

7. ATEPs that require their athletic training students to take a Therapeutic Exercise Laboratory course resulted in a significantly greater likelihood of passing the national certification examination and the written and the written simulation sections.

8. The affiliation of the institution's intercollegiate athletics program was the primary site for the athletic training students' clinical experience. ATEPs that recognized NCAA Division I as a primary clinical setting was significant in producing a higher first time pass percentage on the national certification examination compared to NCAA Division III clinical settings.

9. Consistent with the interpretation of CAAHEP standard IB1c(2)(a), 49 percent of all ATEPs assign clinical educators to supervise the athletic training students instead of assigning students to a particular sport or sports rotation. However, no differences appear to exist regarding the ATEPs clinical structure and the first time pass percentage on the national certification examination.

10. The ability for the student to independently perform functional assessments, being exposed to a general medical physician, and the student's requirement to take a

therapeutic exercise laboratory course lead to significantly better scores on the national certification examination. The multiple regression analysis that combined these aforementioned psychomotor competencies determines that 16.7 percent of the passing score could be determined by these variables. The effect size demonstrates a strong relationship between the combined variables and an institution's first time pass percentage on the written section of the national certification exam.

11. The institution's first time pass percentage on the national certification examination was significantly better when allowing students to perform the following psychomotor competencies: (1) to present athletes (and injuries) to a general medicine/internist for evaluation, (2) the opportunity for the student to travel independently with assigned sport teams, (3) or to cover organized sports practices, and (4) the opportunity to independently performs functional assessment for safe return to physical activity. These variables, when combined, had an 25.7 percent prediction rate, which demonstrated a strong relationship among the institutional characteristics and first time success on the national certification examination.

12. Exposure to a general medical physician resulted in a 9.8 percent prediction ability of an ATEP's chances at having a higher first time pass percentage. This effect size demonstrates a moderate relationship between this variable and an institution's first time pass percentage on the practical section of the examination.

13. The recognition of a Therapeutic Exercise Laboratory as a separate course requirement resulted in a 5.5 prediction percentage. This effect size demonstrates a

moderate relationship between this variable and an institution's first time overall pass percentage, and on the written simulation section.

Recommendations

Further studies are warranted to confirm or refute the findings in this investigation:

1. Research is needed to assess the influences size of an institution and the year the athletic training education program was accredited to determine the low number of student taking the national certification examination from ATEP's that were initially developed and accredited after 1993. Do the institutional characteristics influence attrition? Do athletic training student from institutions with these certain characteristics tend to pursue careers other than athletic training and if so, what motivated these students to seek alternate careers.
2. A comparison of allied health profession's education programs and the employment of full time teaching faculty and clinical educators needs to be addressed in order to determine if differences exist and whether this influences the first time pass percentage among other allied health professions and their national certification examinations.
3. Research needs to be completed to determine if the revisions to the existing competency domain entitled "Management, Treatment, and Disposition" that was divided into five separate content areas, will result in major changes in the curricular content. If so, how will these changes affect existing curriculum structure, mainly the

amount of time devoted to the rehabilitation of athletic injuries and existing content areas? If the changes in the Athletic Training Competencies were influenced by the recent Role Delineation Study (1999), how will these revisions affect success rate on the national certification examination?

4. Additional studies are needed to determine if ATEPs that were developed prior to 1993 produced a higher pass percentage on the NATA Board of Certification Examination, and the Written and Written Simulation Section. Differences were not significantly validated for the 2000 NATABOC reporting year, but a higher first time pass percentage on the national certification examination and all its components for ATEPs developed prior to 1999 warrant further investigation.

5. Lastly, an investigation of ATEPs that do not require an interview as an admissions requirement to determine why they have a higher first time pass percentage on the national certification examination.

Appendix A
Description of Variables

Description of Variables

- (A1) ATEP. Year when program was formally recognized. (Dichotomous, 1= prior to 1993, 2=after 1993)
- (A2) Accrediting agency. Agency that initially authorized or accredited athletic training education program. (Categorical, 1= PEC, 2= CAHEA, 3= CAAHEP)

Institutional Characteristics

- (B1) Institutional Classification. Based on the Carnegie Classification for higher education. (Categorical, 1=Research Extensive, 2= Research Intensive, 3= Masters I/II, 4= Liberal)
- (B2) Program location. College, division or department in which the ATEP is located. (Categorical, 1 = Health, Physical Education and Recreation, 2 = Exercise Science, 3 = Allied Health/Sports Medicine, 4 = Education; 5 = other)
- (B3) Faculty. Full-time faculty that primarily teach in the ATEP. (Continuous)
- (B4) Clinical Educators. Full-time clinical instructors that service the ATEP. (Continuous)
- (B5) Dual-Role Educator. Full-time educator that splits time between faculty and clinical educator. (Continuous)
- (B6) Part time educator. Part-time clinical educators to include graduate assistants. (Continuous)
- (B7) PD years. Number of years ATEP Director was in this position. (Continuous)
- (B8) PD degree. Terminal degree of the ATEP Director (Categorical, 1= PhD/EdD, 2= MS/MA, 3= lower than MS/MA)
- (C9) ATEP Students. Number of Students formally accepted into the athletic training education program. (Continuous)

Programmatic Characteristics

- (C1) Admission Requirements. Requirements that must be met prior to eligibility for acceptance into an ATEP. (Dichotomous, 1= yes, 2= no)
- (C2) Curriculum. Required courses in the ATEP. (Dichotomous, 1= yes; 2= no)
- (C3) Clinical Setting. Primary clinical setting as defined by the athletic affiliation. (Categorical, 1= NCAA Division I, 2= NCAA Division II, 3= NCAA Division III, 4= NAIA, 5= Other)
- (C4) Clinical Structure. Description of the clinical experience. (Categorical, 1= assignments by athletic season, 2= periodic sports rotation, 3= assigned to clinical instructor, 4= other)
- (C5) Competencies. Psychomotor competency requirements during clinical experience. (Dichotomous, 1= yes, 2= no)
- (C6) Affective. Characteristics that are established and practiced by clinical educators in primary clinical settings. (Dichotomous, 1= yes, 2= no)

Appendix B
Athletic Training Education Program Survey

Athletic Training Education Program (ATEP) Survey

- 1) Which category best describes when your ATEP received initial accreditation or approval?
 - ☐ Approval prior to 12/30/93
 - ☐ Accreditation after 01/01/94

- 2) Which accrediting agency initially provided approval or accreditation to your ATEP?
 - ☐ PEC
 - ☐ CAHEA
 - ☐ CAAHEP

- 3) The primary clinical setting is located in the institutions intercollegiate athletic department.
 - ☐ yes
 - ☐ no

- 4, 5, and 6 must add to total full-time faculty/staff for the ATEP. Do not count faculty and staff more than once.*

- 4) The number of full time faculty that teaches in the ATEP and is also certified athletic trainers?

_____ Total number of full time faculty (with ATC)

- 5) The number of full time clinical educators that supervise students in your primary clinical setting?

_____ Total number of full-time clinical educators

- 6) The number full time dual-role educators that is required to provide classroom and clinical education.

_____ Total number of dual-role educators

- 7) Number of part-time (to include graduate assistants) clinical educators that work in your primary clinical setting?

_____ Total number of part-time clinical educators

- 8) What is the total number of students that are accepted into the ATEP each year?

_____ Total number of students

- 9) Which best describes the type of clinical experience of the student accepted into the ATEP. (Select one)
 - ☐ Assigned to sport by athletic season
 - ☐ Assigned to sport on a rotation basis
 - ☐ Assigned to specific clinical educator
 - ☐ Other: _____

- 10) The number of years the athletic training program director was in his/her position?

_____ Total number of years

- 11) Highest degree attained by your program director.
 - ☐ PhD/EdD
 - ☐ MS/MA
 - ☐ Lower than MS/MA

12) Of the following what competencies are required during a student's clinical experience after accepted into the ATEP?

(Check all that apply)

- ☐ Required assignment with a fall football experience.
- ☐ Required assignment with women's sport experience.
- ☐ Required to demonstrated competency on an isokinetic dynamometer.
- ☐ Required participation with preseason physical examinations & physicals.
- ☐ Required to present athlete (and injury) to general medicine/internist for evaluation.
- ☐ Required to present athlete (and injury) to orthopedic surgeon for evaluation.
- ☐ Required to complete medical documentation on athletic injury/illness evaluations and rehabilitation.
- ☐ Required mandatory attendance at an annual seminar to review emergency techniques and protocols.
- ☐ Required to shadow allied health professionals other than certified athletic trainers.
- ☐ Provides the opportunity for the student to travel independently with assigned sport teams.
- ☐ Provides an opportunity for the student to independently cover organized sports practices.
- ☐ Expected to independently perform functional assessment for safe return to physical activity

13) Of the following what resources are the students exposed to in the primary clinic setting?

(Check all that apply)

- ☐ Student Athletic Trainer Manual (pertaining to policy, procedures expectations)
- ☐ Student Athletic Trainer Code of Conduct
- ☐ Annual inservice regarding OSHA regulations & Exposure Control Plan
- ☐ Access to educational resource and required text books in the clinic setting
- ☐ Access to a computer and Internet for research purposes
- ☐ Access to institutional policy and position stands regarding various medical situations
- ☐ Grievance procedure in place for the student athletic trainer
- ☐ Access to the formal staff & administrative structure
- ☐ Access to the policy on medical referral of the injured/ill athlete
- ☐ Rehabilitation protocols are available for the students to access and implement
- ☐ A student advisory board is in place and provides student representation in staff meetings.

Appendix C

Survey Letter

WESTERN MICHIGAN UNIVERSITY

H. S. I. R. B.

Approved for use for one year from this date:

OCT 02 2001

15 October 2001

[Signature]
HSIRB Chair

Program Director:

You are invited to participate in a national survey to assess the institutional and programmatic differences of entry-level accredited athletic training programs. The enclosed survey has been sent to the program directors of CAAHEP accredited athletic training programs. The survey will be used in combination with the 2000 NATABOC Examination results that have been obtained from CASTLE Worldwide Inc., specifically, the first time pass percentage. A brief ~~five-minute~~ time involvement will be required for your participation in completing this survey.

Since this study will deal with institutional success in preparing students for the athletic training profession, there are no known risks to you or your students. The researcher has no interest in the test results for the individual candidate or the institution success rate. For this study, the only identification of the institution will be in accordance to certain institutional and programmatic characteristics, and as a result, confidentiality will be maintained. This research may produce valuable information regarding which institutional and programmatic characteristics are present in athletic training programs that are more successful in producing students that pass the national certification examination.

If any questions or concerns arise prior to completing this survey, you may contact Dr. Charles Warfield at 616 387-3890, Donna Ritenour at 616-387-2698 or email at ritenour@wmich.edu. Any questions or concerns you may have about your rights as a participant in this research study please contact Western Michigan University's Human Subjects Institutional Review Board at 616-387-8298. This consent document has been approved for use by the Human Subjects Institutional Review Board as indicated by the stamped date and signature of the board chair in the upper right hand corner. You should not participate in this if the corner does not have a stamped date and signature. Please complete the survey and return it in the preaddressed stamped envelope by November 1, 2001.

Thank you for your time in completing this survey.

Sincerely,

[Signature]
Donna M. Ritenour MS, ATC

Appendix D

Release of Confidential Information Form

WESTERN MICHIGAN UNIVERSITY

WESTERN MICHIGAN UNIVERSITY

H. S. I. R. B.

Approved for use for one year from this date:

Release of Confidential Information

OCT 02 2001

x 

HSIRB Chair

Principal Investigator: Dr. Charles Warfield

Student Investigator for Dissertation: Donna M. Ritenour

I have been invited to participate in a research project entitled "Institutional and programmatic differences among entry-level athletic training programs in preparing students for the national certification examination." For this research study, I consent to the release of the institution's first-time pass percentage on the 2000 National Athletic Trainers' Association Board of Certification Examination, the report, to be issued to the researchers by this certifying agency.

All of the information collected from me and the National Athletic Trainers' Association Board of Certification is confidential. That means that my name will not appear on any papers on which this information is recorded. The forms will all be coded and the researchers will keep a separate master list with the names of the institutions and corresponding code numbers. Once data are collected and analyzed, the master list will be destroyed. All other forms will be retained for three years in a locked file in the principal investigator's office.

I may refuse to participate or quit at any time during the study without prejudice or penalty. If I have any questions or concerns about this study, I may contact Dr. Charles Warfield at 616 387-3890 or Donna Ritenour at 616-387-2698. Any questions or concerns I may have about my rights as a participant in this research study will be directed to Western Michigan University's Human Subjects Institutional Review Board at 616-387-8298.

This Release of Confidential Information document has been approved for use by the Human Subjects Institutional Review Board as indicated by the stamped date and signature of the board chair in the upper right hand corner. You should not participate in this if the corner does not have a stamped date and signature.

Signature

University

Date

Release obtained by:

Date

Appendix E
Data Record Sheet

Data Record Sheet**Institutional Code #** _____

- 1) Year ATEP (A1) ☐ 1= yes ☐ 2= no
- 2) Accrediting agency (A2) ☐ 1= PEC ☐ 2= CAHEA ☐ 3= CAAHEP
- 3) Classification (B1) ☐ 1= Research Extensive ☐ 2= Research Intensive
☐ 3= Masters I/II ☐ 4= Liberal
- 4) ATEP Location (B2) ☐ 1= Allied Health/medicine ☐ 2= Exercise Science
☐ 3= HPER ☐ 4= Education ☐ 5= other: _____
- 5) ATC Faculty (B3) _____ Total number
- 6) Clinical educators (B4) _____ Total number
- 7) Dual-role educators (B5) _____ Total number
- 8) Part-time & GAs (B6) _____ Total number
- 9) ATEP Director (B7) _____ Total number of years
- 10) PD Degree (B8) ☐ 1= PhD/EdD ☐ 2= MS/MA ☐ 3= Other: _____
- 11) ATEP students (C1) _____ Total number
- 12) Preprofessional Requirements (C2)
- | | | |
|-----------------------------|---------------------------------|--------------------------------|
| a. Minimum Overall gpa | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| b. Minimum gpa core courses | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| c. Minimum course grades | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| d. AT Experience | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| e. Interview | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| f. ACT Scores | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
- 13) Core Curriculum Requirements (C3)
- | | | |
|-------------------------------|---------------------------------|--------------------------------|
| a. Research | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| b. Nutrition | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| c. Pharmacology | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| d. Sport sociology/psychology | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| e. Administration | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| f. Injury pathology | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| g. Advance emergency care | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| h. Therapeutic modalities lab | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| i. Therapeutic exercise lab | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |

- 14) Primary in ICA (C4) ☐ 1= yes ☐ 2= no
- 15) Affiliation (C4) ☐ 1= I ☐ 2= II ☐ 3= III ☐ 4= NAIA
- 16) Experience Type (C5) ☐ 1= Assigned to sport by athletic season
☐ 2= Assigned to sport on a rotation basis
☐ 3= Assigned to specific clinical educator
☐ 4= Other: _____
- 17) Required Clinical Competencies (C6)
- | | | |
|------------------------------------|---------------------------------|--------------------------------|
| a. Fall football experience | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| b. Women's sport experience | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| c. Isokinetic dynamometer | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| d. Preseason Exams & physicals | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| e. GM/internist Evaluation | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| f. Orthopedic Evaluation | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| g. Medical Documentation | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| h. Emergency Tech & Protocols | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| i. Other Allied Health Professions | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| j. Travel Independent | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| k. Sports Practices | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| l. Functional Assessment | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
- 18) Resources are the students exposed to in the primary clinic setting. (C7)
- | | | |
|------------------------------------|---------------------------------|--------------------------------|
| a. Student Athletic Trainer Manual | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| b. Code of Conduct | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| c. OSHA & Exposure Plan | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| d. Educational Resources | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| e. Computer /Internet Access | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| f. Institutional Policy Access | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| g. Grievance Procedure | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| h. Administrative Structure Access | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| i. Medical Referral Policy Access | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| j. Rehabilitation protocols Access | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |
| k. Student Advisory Board | <input type="checkbox"/> 1= yes | <input type="checkbox"/> 2= no |

Appendix F
Glossary of Acronyms

Glossary of Acronyms

AMA	American Medical Association
ATEP	Athletic Training Education Program
CAAHEP	Commission on Accreditation of Allied Health Education Programs
JRC-AT	Joint Review Committee on Education in Athletic Training
CAHEA	Committee on Allied Health Education and Accreditation
NATA	National Athletic Trainers' Association, Inc.
NATABOC	National Athletic Trainers' Association Board of Certification
NATAEC	National Athletic Trainers' Association Education Council
PEC	Professional Education Committee

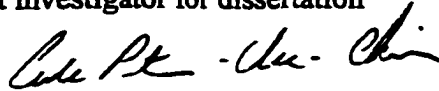
Appendix G
Human Subjects Institutional Review Board
Approval Letter

WESTERN MICHIGAN UNIVERSITY

Date: October 2, 2001

To: Charles Warfield, Principal Investigator
Donna Ritenour, Student Investigator for dissertation

From: Mary Lagerwey, Chair



Re: HSIRB Project Number 01-09-16

This letter will serve as confirmation that your research project entitled "Institutional and Programmatic Differences Among Entry-Level Training Programs in Preparing Students for the National Certification Examination" has been **approved** under the **exempt** category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you may **only** conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: October 2, 2002

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