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Jeremy R. Dicus
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This dissertation titled
Athletic Trainers’ Perceptions on the Adequacy of their Professional Education
by
JEREMY R. DICUS
has been approved for
the Department of Teacher Education
and The Patton College of Education by

_________________________
Ralph E. Martin
Professor Emeritus of Teacher Education

_________________________
Renée A. Middleton
Dean, The Patton College of Education
ABSTRACT

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Athletic Trainers’ Perceptions on the Adequacy of their Professional Education

Director of Dissertation: Ralph E. Martin

The Commission on Accreditation of Athletic Training Education (CAATE) requires all accredited Professional Athletic Training Education Programs, masters and baccalaureate, to teach and assess each competency found in the National Athletic Trainers’ Association (NATA) Athletic Training Educational Competencies. Through this requirement, it is evident that the competencies are being taught in the professional ATEPs. However, there is a gap in the literature addressing athletic trainers’ perceptions about their academic preparation. This study surveyed entry-level athletic trainers to ascertain their perceptions on how well their professional ATEP prepared them to enter the profession. Self-perceptions were acquired from graduates of professional masters and baccalaureate programs across each of the 12 content areas identified in the 4th edition of the NATA Athletic Training Educational Competencies.

To address the purpose of this study, a survey instrument was created. This instrument used competencies from the 4th edition of the NATA Athletic Training Educational Competencies to create 12 scales consisting of four to six items each. One-thousand entry-level athletic trainers were invited to participate in the study. With an initial response rate of 26.8%, usable data was identified for 182 respondents. This sample included graduates from professional masters and professional baccalaureate ATEPs. The web based survey was administered via Qualtrics and data were analyzed with SPSS.
A non-experimental design with a 2x12 between-within repeated measures ANOVA was used in this study. No main effect was observed from the independent grouping variable. Respondents from professional masters programs did not perceive their education differently than respondents from professional baccalaureate programs. A main effect was observed for the within groups factor. There was a statistically significant difference observed between the 12 content areas. A post hoc analysis revealed several significant differences within the 12 content areas. On average, academic preparation was perceived as adequate in all 12 content areas. However, perceptions on the Pharmacology content area were rated significantly lower than each of the other 11 content areas.

This study examined perceptions related to the 4th edition of the NATA Athletic Training Educational Competencies. However, while this study was being completed, the NATA published the 5th edition of the competencies. Future research should utilize the newest version of the competencies as a frame work to address athletic trainers’ perceptions on the adequacy of their professional education.

Approved: _____________________________________________________________

Ralph E. Martin
Professor Emeritus of Teacher Education
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CHAPTER 1: INTRODUCTION

Background of the Study

History of Athletic Training Education

Over a relatively brief time, 1950 to the present, the athletic training profession has made significant changes to its educational process. These changes have occurred as a result of the profession’s continued examination of the educational process of entry-level athletic training students. Through this examination process, the educational changes have resulted in changes to the requirements of entry-level athletic training students. The importance of these changes and how they have impacted the profession should be well understood prior to investigating aspects of the current educational structure. There is extensive athletic training literature that has chronicled these important educational changes (Delforge & Behnke, 1999; Mathies, Denegar, & Arnhold, 1995; Schwank & Miller, 1971; Weidner & Henning, 2002). With literature on the history of athletic training education already established, this study reviews the relevant literature and changes that have impacted the assessment of the current athletic training educational structure.

There are three main national agencies that collaborate to enhance athletic training education. These organizations include the Board of Certification (BOC), the National Athletic Trainers’ Association (NATA), and the Commission on Accreditation of Athletic Training Education (CAATE). Directly or indirectly, each of these organizations plays an important role in the educational process. The work of these agencies intertwines to form the basis for professional athletic training education. Through the policies and standards of these organizations, each credentialed athletic
trainer attains the minimum set of basic skills and knowledge required to perform the
duties of an athletic trainer entering the profession.

*Board of Certification*

The BOC plays several important roles in the education of an entry-level athletic
training student. These roles include publication of the Standards of Professional
Practice, publication of the Role Delineation Study (RDS), and certification of the
athletic trainer. The primary purpose of the RDS is to identify content for the BOC
national certification exam. The RDS also serves as a job analysis of the professional
roles and duties of an athletic trainer. It is designed to identify current practices but not
predict future roles of the athletic trainer. The roles identified in the 5th edition of the
RDS are defined in six practice domains: 1. Prevention, 2. Clinical Evaluation and
Diagnosis, 3. Immediate Care, 4. Treatment, Rehabilitation, and Reconditioning, 5.
Organization and Administration, and 6. Professional Responsibility.

The Standards of Professional Practice include a set of standards that each athletic
trainer must abide by to gain and maintain certification. The BOC also assigns the
professional credential of ATC®, which signifies that an individual is a certified athletic
trainer. While attaining certification is important, it is not a practice credential. While
every state has its own regulations, most states use the BOC certification examination as
a standardized licensing examination when granting athletic trainers the right to practice
in their respective states.

It is important to note, that the BOC defines the roles, sets the standards, and
assigns certification. However, the “BOC does not express an opinion on the competence
or warrant job performance of credential holders” (BOC Standards, p.2).
National Athletic Trainers’ Association

The NATA is a professional membership organization that assists in the advancement of the athletic training profession. Among other roles, the NATA also develops and publishes the NATA Athletic Training Educational Competencies via the NATA’s Professional Education Committee (PEC). The PEC is a committee formed from entry-level educators from the various districts identified by the NATA (National Athletic Trainers’ Association Professional Education Committee, Retrieved June 24, 2012). The competencies were initially generated from the roles defined in the RDS. Currently, the NATA PEC still considers the content of the BOC RDS when creating and updating the NATA Athletic Training Educational Competencies. These competencies are published to provide professional athletic training educational programs (ATEP) with the knowledge and skills which are to be learned by students in professional programs (Athletic Training Educational Competencies, 2006). In other words, this document houses the minimum knowledge and skills that each student must know prior to practicing within the profession. Since these competencies are designed to prepare the individual to practice in the profession, the PEC attempts to predict what the profession will be in the future. This varies from the RDS because the RDS describes what the profession is at the time of publication.

The knowledge and skills outlined in the 4th edition of the NATA Educational Competencies are divided into 12 content areas (NATA Athletic Training Educational Competencies, 2006). The previous edition of the NATA Athletic Training Educational Competencies also consisted of 12 content areas. The 3rd and 4th editions of the NATA Athletic Training Educational Competencies are similar with the primary difference
being a reorganization of some content (NATA Athletic Training Educational Competencies, 2006). Also, the names of three content areas were changed from the 3rd to the 4th editions. The 12 content areas of the 4th edition are:

1. Risk Management and Injury Prevention (RM)
2. Pathology of Injuries and Illnesses (PA)
3. Orthopedic Clinical Examination and Diagnosis (DI)
4. Medical Conditions and Disabilities (MC)
5. Acute Care of Injuries and Illnesses (AC)
6. Therapeutic Modalities (TM)
7. Conditioning and Rehabilitative Exercise (EX)
8. Pharmacology (PH)
9. Psychosocial Intervention and Referral (PS)
10. Nutritional Aspects of Injuries and Illnesses (NU)
11. Health Care Administration (AD)
12. Professional Development and Responsibility (PD)

Commission on Accreditation of Athletic Training Education

The accreditation process for a professional ATEP is overseen by the Commission on Accreditation of Athletic Training Education. To receive accreditation, each program must demonstrate compliance with each of the CAATE standards for the Accreditation of Professional Athletic Training Education Programs (CAATE Standards, 2008). Among other requirements, it is important to note that CAATE standards require accredited programs to demonstrate instruction and evaluation of all NATA Athletic Training Educational Competencies.
In summary, the BOC, NATA, and CAATE hold integral roles in maintaining and enhancing athletic training education. In general, the BOC defines the roles of current athletic training professionals through the RDS. The NATA then utilizes content from the RDS to aid in the development of the NATA Athletic Training Educational Competencies. These competencies define the minimum knowledge and skills that are essential to performing the duties of an entry-level athletic training professional. The competencies differ from the RDS because they are more comprehensive and intended to prepare students for not only the present but also the future of the profession. Finally, Professional ATEPs must demonstrate instruction and evaluation of the NATA Athletic Training Educational Competencies within their curriculum in order to either attain or maintain CAATE accreditation.

When ready, students from an accredited professional athletic training program, register to take the BOC certification examination. All of the steps described above provide the template for athletic training education. However, there is no assurance that every entry-level athletic trainer has truly attained all the knowledge and skills defined in the NATA Athletic Training Educational Competencies. This dilemma has led to a body of literature within the athletic training profession that has examined the perception of athletic trainers toward their academic preparation (Culpo, 2004; Donahue, 2009; Gieck, Lephart, & Saliba, 1986; Kugler, 1994; Massie, 2003; Massie, Strang, & Ward, 2009; Misasi, Davis, Morin, & Stockman, 1996; Starkey and Henderson, 1995; Stiller-Ostrowski & Ostrowski, 2009; Weidner & Vincent, 1992; Whitman, 2008).
Current Athletic Training Educational Structure

This study examined the current educational structure. Thus, it was necessary for the important components of current professional athletic training education to be understood. To obtain national certification as an athletic trainer, one must pass the certification examination administered by the BOC. However, to be eligible to sit for the certification examination, a candidate must graduate from a CAATE accredited professional ATEP. Currently, these ATEPs are offered at both the baccalaureate and masters level. Through this accreditation process, CAATE can ensure that the programs’ curricular content meets a minimum standard that is adequate for entry-level practice. To achieve this, CAATE uses the NATA Athletic Training Educational Competencies as a companion document to the accreditation standards. Every professional ATEP, baccalaureate and masters, must incorporate the NATA Athletic Training Educational Competencies throughout the curriculum. Basically, the minimum content for all professional ATEPs is the same but the method of content delivery varies. Since the competencies form the basis of the curriculum, the 4th edition of the NATA Educational Competencies will be used as a framework for this study. These competencies were incorporated into all professional ATEPs at the beginning of the 2006-2007 academic year (JRC-AT Update, 2005). In summary, current entry-level certified athletic trainers have graduated from an accredited professional ATEP with either a baccalaureate or masters degree in which the 4th edition of the NATA educational competencies provided the curricular framework.
Current Literature on Athletic Training Professional Preparation

The education of an athletic training student is clearly defined and mapped out through the documents and agencies previously described. However, are graduates from professional ATEPs acquiring the defined set of skills and knowledge found within the NATA Athletic Training Educational Competencies? Do graduates from professional masters ATEPs perceive the adequacy of their education to be different than professional graduates with a baccalaureate degree? Literature within the athletic training profession has examined whether or not the academic preparation of athletic trainers is adequate. This literature examined the athletic training population through samples of current students, recent graduates, certified athletic trainers, and employers of athletic trainers. These samples have been utilized to inspect academic preparation through either the BOC domains of practice or the NATA educational content areas found within the NATA Athletic Training Educational Competencies (Culpo, 2004; Donahue, 2009; Gieck, Lephart, & Saliba, 1986; Kugler, 1994; Massie, 2003; Massie, Strang, & Ward, 2009; Misasi, Davis, Morin, & Stockman, 1996; Starkey & Henderson, 1995; Stiller-Ostrowski & Ostrowski, 2009; Weidner & Vincent, 1992; Whitman, 2008). Evidence from this body of literature suggests that there may be specific content areas or domains of practice in need of further observation. Authors have observed that instruction in specific areas was perceived to have been insufficient in meeting the challenges of the profession. The conclusions that have been drawn provide some valuable evidence which may need to be further explored. However, much of this literature examined samples which include athletic trainers who were certified under different circumstances than current entry-level athletic trainers. These samples included athletic trainers who gained certification
through an internship program with little to no didactic education. Thus, there is a need to perform a comprehensive examination of the 12 current content areas and focus should be paid to the participant sample to ensure that it reflects current entry-level athletic training professionals.

While there is extensive literature in the general area of academic preparation, there is still a substantial gap in the literature with regard to academic preparedness. There is only one study that has concurrently examined the BOC performance domains and specific statements that represent the knowledge and skills found within the domains (Massie, 2003). Massie (2003) performed the first examination based on students’ perceptions across all domains of practice. With a unique survey, Massie (2003) assessed the level of preparation in five practice domains through 34 individual statements. These statements were designed to represent the knowledge and skill statements found within corresponding practice domains.

With Massie’s research leading the way, two subsequent studies examined multiple NATA educational content areas (Donahue, 2009; Whitman, 2008). However, they did not assess any individual statements relating to specific competencies found within the content areas. Whitman (2008) used a modified version of the Massie (2003) instrument to assess students’ perception of their ATEP’s ability to adequately prepare them for the BOC certification examination across all 12 content areas. Donahue (2009) surveyed athletic trainers to assess their perception of the importance, preparation, and time spent in the athletic training educational content areas. Donahue assessed the 12 content areas but there was not an examination of any specific competency.
Massie, Strang, and Ward (2009) continued progress in this line of research with the only investigation to concurrently examine all 12 content areas and specific competencies and skills related to the content areas. Massie et al. (2009) examined employers’ perceptions of the academic preparation of entry-level athletic trainer employees. The authors evaluated employers’ perceptions based on each content area. There were also 34 statements used to further assess the 12 current content areas.

Massie (2003), Whitman (2008), Donahue (2009), and Massie et al. (2009) have provided a needed insight into the preparation of athletic trainers for entry into the profession. These studies have examined the perceptions of students, recent graduates, and employers. These studies examined either the five practice domains or the 12 educational content areas. Three of the four studies explored the domains or content areas through the incorporation of individual statements relating to specific knowledge or skills. The evidence these authors have provided is valuable to the profession, but there lacks a comprehensive examination of the 12 content areas through the incorporation of actual educational competencies. The knowledge and skills found within these 12 content areas are important, yet they have not been thoroughly utilized when assessing the academic preparation of an athletic trainer. Studies have also not examined whether or not there are differences in how masters and baccalaureate graduates perceive the adequacy of their professional athletic training education. These gaps in the literature identify a current problem and rationale for this study.

Statement of the Problem

There is an evident need to address entry-level athletic trainers’ perceptions of their academic preparation. Through the RDS, the BOC defines the role of an entry-level
athletic training professional. The NATA Athletic Training Educational Competencies provide the knowledge and skills that must be mastered to fulfill this defined role. Along with the other standards for accreditation, CAATE ensures that ATEPs are addressing the educational competencies in their curriculum. Upon completion of a professional program, students are then able to sit for the BOC certification examination. This examination, prepared by the BOC, mimics content found within the RDS. With successful completion of the BOC examination, a student is granted certification and becomes an entry-level professional. While this system of checks and balances seems thorough, not one of these organizations states with certainty that all entry-level athletic training professionals have mastered the educational competencies found within the 12 content areas. Thus, to assess self-perceptions of educational adequacy, specific competencies that make up each domain should be used when assessing the 12 content areas. Included in this assessment is the consideration of student level. If an individual can enter the profession through either a baccalaureate or masters professional education, there needs to be an examination to observe any potential differences perceived between these two groups of entry-level professionals.

**Research Questions**

The proposed problem described in the above paragraph is addressed through the following research questions:

RQ1: Do employed entry-level athletic training professionals who have graduated from a professional masters program perceive their academic preparation differently than employed entry-level athletic training professionals who graduated from a professional baccalaureate program?
RQ2: Do employed entry-level athletic training professionals perceive their athletic training education the same in the 12 educational content areas designated in the 4th edition of the NATA Athletic Training Educational Competencies?

RQ3: Is there an interaction between the independent variable (professional education) and the 12 educational content areas as dependent variables?

Null Hypotheses

H₀₁: There will be no significant difference in global perceptions of academic preparedness between the professional masters (m) and professional baccalaureate (b) groups.

H₀₁: μₘ = μₜ

H₀₂: There will be no significant difference in the perceptions of academic preparedness across all 12 educational content areas (1-12).

H₀₂: μ₁ = μ₂ ... = μ₁₂

H₀₃: There will be no interaction between the independent and dependent variables. More specifically, no significant interaction will be observed between the masters group and the baccalaureate group in each of the 12 content areas.

H₀₃: μₘ₁ - μₜ₁ = μₘ₂ - μₜ₂ ... = μₘ₁₂ - μₜ₁₂

Significance of the Study

The education of an athletic training student is enhanced through three different organizations and the individual ATEP. Each of these organizations plays an important role in ensuring that every ATEP offers the minimum knowledge and skills needed to be successful as an entry-level athletic training professional. While the process for accreditation and certification is thorough, there still lacks current evidence to support the
presumption that students who graduate from professional baccalaureate and masters programs perceive their education with the same adequacy. There is also a lack of evidence that students from accredited ATEPs perceive their education to be adequate in each of the 12 content areas. Finally, there is also a lack of evidence to support the assumption that each entry-level athletic training student perceives that they have mastered all of the knowledge and skills outlined in the NATA Athletic Training Educational Competencies. Investigating these problems will benefit the student, ATEP, and athletic training profession.

This study sheds light upon entry-level professionals’ perceptions about their professional athletic training education. These perceptions provide information related to self-perceived differences in the educational adequacy of masters and baccalaureate entry-level graduates. This may prove valuable as the profession examines the potential transition to only professional masters programs. The information gained from this study may also provide valuable insight into educational content areas where there is a perceived lack of knowledge. Athletic training education programs are charged with developing students into entry-level professionals and information gained from this study may be used to place needed emphasis on different areas of a designed curriculum. These changes could fill a void that is self-perceived by recently graduated professionals. With the potential voids filled, current students will enter the profession better prepared to perform the duties of a certified entry-level athletic training professional.

Delimitations

This study is delimited by the following factors:
1. The proposed sample consisted of participants who took and passed the BOC certification examination on their first attempt between June 2007 and November 2011.

2. A survey instrument was developed and used to identify the participants’ perceptions of their academic preparation with regards to the 12 educational content areas found within the 4th edition of the NATA Educational Competencies.

3. Four to six competencies from each of the 12 content areas were carefully selected for use in the instrument.

Limitations

This study is limited by the following factors:

1. Results from the proposed study are generalized to entry-level athletic training professionals who took and passed the BOC certification exam on their first attempt.

2. Results are limited to athletic training professionals educated via the 4th edition of the NATA Athletic Training Educational Competencies.

3. The results of this study are based on the assumption that the respondents provided true and accurate answers to the questions found within the instrument.

4. The results of this study are limited to the respondents’ ability to accurately remember perceptions of their knowledge and skills upon completing their professional ATEP’s designed curriculum.
Definition of Terms

The following are the operational definitions of terms used in this study. More detailed discussion of these terms is provided in Chapter Two.

- **Athletic Training Profession**: “Athletic training is practiced by athletic trainers, health care professionals who collaborate with physicians to optimize activity and participation of patients and clients” (http://www.nata.org/athletic-training, Retrieved April 4, 2011).

- **Athletic Training Student (ATS)**: “A student enrolled in the athletic training major or graduate major equivalent” (CAATE Standards, 2008, p. 16).

- **Board of Certification (BOC)**: “The BOC establishes and regularly reviews both the standards for the practice of athletic training and the continuing education requirements for BOC Certified ATs” (http://www.bocatc.org/index.php?option=com_content&view=article&id=27&Itemid=29, Retrieved April 4, 2011).

- **Certified Athletic Trainer**: An athletic trainer who has met all requirements for BOC certification as an athletic trainer.

- **Commission on Accreditation of Athletic Training Education Programs (CAATE)**: CAATE serves “to develop, maintain, and promote appropriate minimum standards of quality of entry-level Athletic Training education programs” (CAATE Standards, 2008, p. 2).

- **Professional Athletic Training Education Program (ATEP)**: Professional ATEPs are available at both the graduate and baccalaureate level. These programs are
intended for students seeking to enter the profession of athletic training. They receive accreditation through CAATE.

- National Athletic Trainers’ Association (NATA): The NATA “is the professional membership association for certified athletic trainers and others who support the athletic training profession” (http://www.nata.org/athletic-training, Retrieved April 4, 2011).

- NATA Executive Committee for Education (ECE): This committee “was formed in 1996 in response to recommendations from the NATA Task Force on Education” and “sets the direction for athletic training education” (ECE, Retrieved May 5, 2011).

- NATA Athletic Training Educational Competencies: Professional education is a competency based approach. These competencies are a companion document to the Standards for the Accreditation of Professional Educational Programs for the Athletic Trainer. “The Competencies define the educational content that students enrolled in an accredited athletic training program must master” (Athletic Training Educational Competencies, 2006, p. 1).

- Role Delineation Study (RDS): A study conducted by the BOC to “establish and validate appropriate content areas for NATA’s national certification examination for athletic trainers” (RDS, 1999, p. 1). The study serves to analyze the work that certified athletic trainers engage in.
Chapter 1 Summary

A gap exists in the professional literature regarding entry-level athletic trainers’ perceptions on their academic preparation. Several authors have examined academic preparation but none have performed a thorough examination with specific focus paid to all 12 content areas or the specific competencies housed in the NATA Educational Competencies. Many of these previous studies examined perceptions of academic preparation with reference to BOC domains. While these studies have provided valuable insight into academic preparation, the domains may not provide the best foundation when assessing academic preparation. The domains are utilized by the BOC when preparing the certification examination, but certification is not a practice credential. It is the competencies that are used to guide the professional ATEPs curriculum. Since the competencies guide program curriculum, it stands to reason that self-perceptions about academic preparation would best be evaluated through the educational content areas with the competencies providing the foundation.

Much of the previous literature has also utilized a sample which does not accurately represent current professional athletic training students. Currently, all students must graduate from an accredited professional ATEP at either the masters or baccalaureate level. However, recent studies have focused on the perceptions of athletic trainers who achieved certification without graduating from an accredited program. The information gained from these studies were representative of entry-level professionals before 2004, but with the deletion of the internship route as a valid path to certification, less attention should be paid to the perceptions of those athletic trainers who completed the internship. No study has separated perceptions of professional masters from
professional baccalaureate participants. With the intent being an examination of current education practices, this study’s sample will include athletic trainers who closely represent the current educational structure.

This apparent gap in the literature is examined in detail in Chapter 2, and provides a basis for this study. An instrument created for this study used the 12 content areas and their respective competencies as a foundation to assess self-perceptions on academic preparation. This instrument assessed both masters and baccalaureate entry-level athletic trainers’ perceptions about their professional ATEPs ability to prepare them academically. The information gained from this study may provide insight into areas where ATEPs need to improve their curriculum. This should serve to better prepare athletic training graduates to enter to the profession.
CHAPTER 2: REVIEW OF LITERATURE

Introduction

There are two main areas of literature that must be examined when attempting to address the questions associated with an athletic trainer’s perception of their academic preparation. The first main block of literature relates to athletic training education. With a thorough understanding of the athletic training education process, one can then address the literature that has already been published on the academic preparation of athletic trainers.

The first section of this literature review addresses the current educational structure. Since this study is aimed at examining the current preparation of entry-level athletic training professionals, the entire history of athletic training education will not be examined. The important historical moments that have advanced the profession to where it is today have been thoroughly documented in the literature (Delforge & Behnke, 1999; Grace, 1999; Mathies, Denegar, & Arnhold, 1995; Schwank & Miller, 1971; Weidner & Henning, 2002). Rather than examine the past, this section provides a summary of the education of athletic training professionals. This summary will guide the reader through the roles of the three professional organizations that govern athletic training education. These organizations include the Commission on Accreditation of Athletic Training Education (CAATE), the National Athletic Trainers’ Association (NATA), and the Board of Certification (BOC). After examining the roles of these organizations, the current educational structure can be examined. The structure must be examined because this study aims to address the academic preparation of current entry-level athletic training professionals.
After an understanding of the education of an athletic trainer is gained, the critical examination of the body of literature which addresses academic preparation of the athletic trainer can be undertaken. This second section examines the results and different methods that have been used to answer the questions regarding whether or not athletic training students are adequately prepared to enter the profession. Some studies examined specific parts of the education (Culpo, 2004; Misasi, Davis, Morin, & Stockman, 1996; Stiller-Ostrowski & Ostrowski, 2009) while others inspected either the overall outcome or all of the educational content areas (Donahue, 2009; Gieck, Lephart, & Saliba, 1986; Kugler, 1994; Massie, 2003; Massie, Strang, & Ward, 2009; Starkey and Henderson, 1995; Weidner & Vincent, 1992; Whitman, 2008). Researchers also utilized several different populations to address academic preparation. These populations included students, certified athletic trainers, and employers of athletic trainers.

Summary on the Education of the Athletic Training Professional

The field of athletic training is relatively young when compared to other allied health professions. The major developments of the athletic training profession, which will be discussed in the following sections, are closely aligned with the development of the NATA. According to the NATA website athletic trainers are “health care professionals who collaborate with physicians to optimize activity and participation of patients and clients” (http://www.nata.org/about_AT/whatisat.htm, Retrieved April 4, 2011). The NATA further elaborates by stating that the profession of athletic training “encompasses the prevention, diagnosis, and intervention of emergency, acute, and chronic medical conditions involving impairment, functional limitations, and disabilities” (http://www.nata.org/about_AT/whatisat.htm, Retrieved April 4, 2011).
a student entering the profession described above requires a program that coordinates didactic and clinical components into a cohesive program. Before the current educational process can be examined there must be an understanding of the educational structure and how it has been designed.

*The NATA, BOC, and CAATE*

The education of an athletic trainer is directly or indirectly affected by three different organizations. Each of these organizations plays an important role in the creation of several safeguards which are designed to ensure that athletic trainers who enter the profession have an adequate level of knowledge and ability. The first organization is the Commission on Accreditation of Athletic Training Education. CAATE is responsible for the accreditation of athletic training education programs. CAATE continues to use the Standards for the Accreditation of Entry-level Athletic Training Education Programs as the guide for this accrediting process. If a program meets the minimum standards set by CAATE then they can apply for accreditation. This process is important because in order for an athletic training student to sit for their certification examination they have to graduate from a CAATE accredited program. According to CAATE the professional preparation of athletic trainers is based on the development of specific educational proficiencies and competencies.

The competencies and proficiencies referred to by CAATE are published by the NATA. These competencies represent the knowledge and skills that define the core content of the athletic training educational process (Athletic Training Educational Competencies, 1999). Among other purposes, accreditation from CAATE confirms that a
program adequately incorporates these competencies into the education of its athletic training students.

The competencies and their source are important. This is where the BOC plays an important role in the education of an athletic trainer. Through a designated process, the BOC identifies “quality healthcare professionals through a system of certification, adjudication, standards of practice, and continuing competency programs” (BOC Standards, 2006, p. 1). One of the roles that the BOC plays in the academic preparation of an athletic trainer is to conduct the role delineation study, which accurately defines the roles and tasks of an athletic trainer. The role delineation study is utilized for a couple of purposes. It provides the framework from which the educational competencies are created and it provides evidence that the content in the certification examination is valid (RDS, 2004). The certification is the second important role of the BOC. Through this certification examination the BOC confers the ATC® credential which allows an individual to enter the profession as an athletic trainer. It is important to note at this time that while the BOC is responsible for conferring the ATC® credential the “BOC does not express an opinion on the competence or warrant job performance of credential holders” (BOC Standards, 2006, p. 2). The final role the BOC plays relates to a document that is published: the Standards of Professional Practice (2006). Upon receiving the ATC® credential the athletic trainer is required to abide by these standards, which are designed to help evaluate “the quality of their patient care” and “assist the athletic trainer in understanding the duties and obligations” that are bestowed upon them by carrying the ATC credential® (BOC Standards, 2006, p. 1).
The collaboration between the NATA, BOC, and CAATE has helped to regulate the education of athletic trainers. It is a complex system with many safeguards, but with the BOC stating that the ATC® credential does not guarantee competence as an athletic trainer, one examines whether or not athletic trainers are entering the profession with an adequate knowledge base. This perception of professional preparation has been addressed by several researchers and will be examined in the next section of this chapter.

Current Education of the Athletic Training Professional

This study examines the academic preparation as it relates to the current educational structure. Thus, it is necessary for the important components of current professional athletic training education to be understood. Currently, to obtain national certification as an athletic trainer one must pass the certification examination administered by the BOC. However, to be eligible to sit for the certification examination, a candidate must graduate from an accredited professional ATEP.

As previously stated, accreditation of a professional education program is granted by CAATE. Currently, these ATEPs are offered at both the baccalaureate and masters level. Through the accreditation process, CAATE can ensure that the curricular content for each professional program is standardized and adequate for entry-level practice. To achieve this, CAATE uses the NATA’s Educational Competencies as a companion document to the accreditation standards. Every professional baccalaureate and masters ATEP must incorporate the NATA Athletic Training Educational Competencies throughout the curriculum. Basically, the content for all professional ATEPs is the same, but the method of content delivery varies.
In 2011, the NATA released the fifth edition of the NATA Athletic Training Educational Competencies. However, these were not incorporated into the curriculum before completion of this study. Thus, the 4th edition of the competencies was used for this study. The 4th edition of the competencies was incorporated into all professional ATEPs at the beginning of the 2006-2007 academic year (JRC-AT Update, 2005). This edition is divided into 12 content areas. Each of these areas contains a list of cognitive and psychomotor competencies. These competencies form the knowledge and skills deemed necessary for entry-level practice as an athletic trainer. The 12 content areas include: 1. Risk Management and Injury Prevention (RM); 2. Pathology of Injuries and Illnesses (PA); 3. Orthopedic Clinical Examination and Diagnosis (DI); 4. Medical Conditions and Disabilities (MC); 5. Acute Care of Injuries and Illnesses (AC); 6. Therapeutic Modalities (TM); 7. Conditioning and Rehabilitative Exercise (EX); 8. Pharmacology (PH); 9. Psychosocial Intervention and Referral (PS); 10. Nutritional Aspects of Injuries and Illnesses (NU); 11. Health Care Administration (AD); and 12. Professional Development and Responsibility (PD).

In summary, when this study was conducted, current certified entry-level athletic training professionals graduated from an accredited professional ATEP with either a baccalaureate or masters degree in which the 4th edition of the NATA athletic training educational competencies have provided the curricular framework. However, none of the three agencies that help guide athletic training education guarantee the competence of an entry-level athletic trainer. This leads to the next section which examines the literature that has examined the professional preparation of athletic trainers.
Professional Preparation

The ability of athletic training educational programs to prepare graduates for professional practice has been examined through varied methodologies. These studies have examined whether or not the education that athletic training students receive adequately prepares them for entry-level practice in the profession. Some studies utilize employers to ascertain whether or not their new graduate employees were adequately prepared for the job or profession (Massie, Strang, & Ward, 2009). Other studies survey directly the athletic training students to ask their perceptions about whether or not they believe their education has prepared them (Massie, 2003; Whitman, 2008). Another way that professional preparation has been researched is through surveying the perceptions of recent graduates (Culpo, 2004; Donahue, 2009; Gieck, Lephart, & Saliba, 1986; Kugler, 1994; Misasi, Davis, Morin, & Stockman, 1996; Stiller-Ostrowski & Ostrowski, 2009; Weidner & Vincent, 1992). Rather than survey a student prior to their graduation, this approach examines the recently graduated professional to ascertain whether or not their undergraduate education adequately prepared them for their entry into the profession and work force.

Academic preparation for entry into the profession has also been examined through investigation of the individual components of an athletic training student’s education, rather than the education as a whole (Culpo, 2004; Misasi, Davis, Morin, & Stockman, 1996; Stiller-Ostrowski & Ostrowski, 2009). These studies provide a glimpse at the adequacy of undergraduate education, but they may lack the comprehensiveness needed to examine the entirety of the 12 content areas and associated competencies set forth by the NATA. Other studies have provided a more comprehensive examination of
athletic training education through an evaluation of the adequacy of undergraduate educational preparation in each of the six BOC performance domains (Donahue, 2009; Gieck, Lephart, & Saliba, 1986; Kugler, 1994; Massie, 2003; Massie, Strang, & Ward, 2009; Starkey and Henderson, 1995; Weidner & Vincent, 1992; Whitman, 2008). The following paragraphs examine these varied approaches and attempt to reveal the compelling findings as well as identify the areas that our profession has yet to investigate.

*Professional Preparation of Individual Educational Components*

The first three studies to analyze examined individual components that make up the entirety of an athletic trainer's academic preparation. Each of these studies performed a comprehensive examination of one aspect of professional preparation, rather than the whole. Misasi, Davis, Morin, and Stockman (1996) addressed a singular area of professional preparedness when they examined the preparation of athletic trainers as counselors. The authors randomly selected and sent surveys to athletic trainers at different colleges and universities. The survey instrument was a modified version of the Revised Wylie Inventory. The instrument required respondents to rank eleven counseling areas based on the most and least counseled areas in their past. The survey also ascertained whether or not the respondent felt their academic and clinical programs prepared them to counsel in the eleven areas. Respondents were then asked if they thought there needed to be increased instruction in any of the eleven areas and in what setting the instruction should be emphasized. Sixty eight percent of the 132 surveys were returned and percentages were calculated for each of the questions. The authors did not report any form of statistical analysis. However, from the responses collected, the eleven counseling areas were ranked in the following order; injury rehabilitation, injury
prevention, nutrition, alcohol problems, drug use/abuse, sexual issues, relationship issues, racial issues, family matters, financial issues, and suicide (Misasi et al., 1996). The authors also reported that respondents did not feel prepared by their educational programs for racial issues, suicide, financial issues, and alcohol problems (Misasi et al., 1996). According to respondents, the clinical portion of their education only prepared them to counsel in the areas of injury prevention, injury rehabilitation, and nutrition (Misasi et al., 1996). It was also reported that all eleven areas of counseling explored should have more and equal emphasis placed on them in both the academic and clinical settings (Misasi et al., 1996).

Stiller-Ostrowski and Ostrowski (2009) performed a study to address perceived level of academic preparation in a specific NATA content area, Psychosocial Intervention and Referral. To address the level of perceived preparedness, the authors utilized a mixed methods design with a focus on the qualitative methods. Three semi-structured focus group interviews were conducted with a total of eleven athletic trainers (Stiller-Ostrowski & Ostrowski, 2009). Core questions were developed to form categories in which to organize the interviews. At the completion of each category, subjects were asked to rank the level at which their athletic training education program prepared them to deal with the corresponding category. Stiller-Ostrowski and Ostrowski (2009) reported that the athletic trainers in the study felt “less proficient at handling communication and interpersonal issues with coaches and parents, at inspiring under motivated and noncompliant athletes, and at recognizing and addressing psychosocial issues with athletes” (Stiller-Ostrowski and Ostrowski, 2009, p. 74). The authors also reported that athletic trainers in their study
learned very little about counseling and social support, mental skills training, and psychosocial referral (Stiller-Ostrowski and Ostrowski, 2009).

Culpo (2004) also utilized a qualitative approach to address the perception of academic preparedness. This design used two, ninety minute interviews with six recently graduated but employed athletic trainers. Culpo (2004) discussed the level of professional preparation in terms of technical and fundamental knowledge dissemination. Technical knowledge included the knowledge and skill necessary to practice in the profession while fundamental knowledge related to professional values, personal attributes, and the behaviors expected of professionals in the field. The author recognized that there are three main documents which govern athletic training education. Culpo (2004) also stated that these three documents “…have clearly defined technical knowledge requirements of entry-level certified athletic trainers” (p. 5). With technical knowledge clearly defined, Culpo (2004) described fundamental knowledge as encompassing professional values, personal attitudes and attributes, and specific behaviors needed to be successful in the profession. Culpo (2004) ultimately concluded that the participants in this study felt comfortable with the level of their technical knowledge but they struggled with fundamental knowledge issues upon graduation and entry into the workforce.

Global Examinations of Professional Preparation

One of the first studies that assessed whether or not athletic trainers were satisfied with their professional preparation as a whole was performed by Gieck, Lephart, and Saliba (1986). In 1984, the authors surveyed respondents who were certified in 1974 and 1979. This sample gave the authors a pool of athletic trainers who had been certified for 5 and 10 years respectively. The survey addressed several issues including employment
history, professional qualifications, preparation, and achievement (Gieck et al., 1986). Professional preparation was separated into two questions, the adequacy of academic preparation and clinical preparation. A 3rd question assessed if respondents felt adequately prepared to enter the profession. These questions were answered with either agree or disagree. With a 60% response rate, Gieck et al. (1986) combined the results from the five and ten year certification groups. With 90% of the respondents agreeing to the corresponding questions, the authors reported that the educational preparation was appropriate. Gieck et al. (1986) also reported that the weakest educational areas, as reported by the respondents, included nutrition, adapted physical education, psychology, and therapeutic modalities. The authors then used a Chi-square analysis with an a priori alpha level of .01 to examine answers to two other questions from the instrument. These questions included whether or not year of certification or route to certification were different with relation to academic preparation, clinical preparation, and confidence as an entry-level athletic trainer. No significant differences were noted and thus the authors concluded that athletic trainer’s perception of preparedness and confidence were independent of both years certified and method of educational preparation (Gieck et al., 1986).

Weidner and Vincent (1992) also assessed the perceived adequacy of entry-level athletic trainers’ professional preparation. The authors compared these perceptions of adequacy to select demographic and employment characteristics. A self reporting questionnaire was designed for the study. The authors used a five point Likert scale with the respondents rating their level of agreement to statements regarding their professional preparation. This study separately investigated the didactic and clinical components with
relation to academic preparation. The authors used the survey statements to investigate either athletic training task areas or content from the NATA guidelines for implementation of undergraduate athletic training education programs (Weidner & Vincent, 1992). The areas investigated were prevention of athletic injuries and illnesses, evaluation of athletic injuries and illnesses, first aid and emergency care, rehabilitation and conditioning, organization and administration of athletic training program, counseling and guidance of athletes and education of athletes, parents, and coaches (Weidner & Vincent, 1992). The authors identified their sample as athletic trainers who passed the NATA certification exam in the spring of 1989. A survey was sent to each of the 277 athletic trainers in the identified population. There was a 66 percent response rate. Using frequencies, the authors reported that the greatest satisfaction occurred for both the academic and clinical preparation in prevention, evaluation and recognition, and first aid and emergency care. The respondents reported satisfaction less frequently with the areas of rehabilitation and reconditioning, organization and administration, counseling and guidance, and education of the athlete. Finally the authors reported that respondents were only “somewhat certain that they developed an appropriate level of professional maturity prior to entering the job market” (Weidner & Vincent, 1992, p. 306). The authors of this study provide little discussion on the statistical procedures used to examine the data. An ANOVA was run to look for differences in select demographic or employment characteristics when compared to the reported adequacy of preparation in the seven areas examined. No specific information was given about the parameters of the ANOVA. The authors did not find any significant differences between the variables. This observation is interesting because the study was performed during a time period when
there were two routes to certification, the internship and NATA undergraduate program. The authors reported no significant differences between the groups and concluded that both the internship and approved-curriculum routes to certification were adequately providing academic and clinical professional preparation to students in the areas of evaluation and recognition, prevention, and first aid and emergency care (Weidner & Vincent, 1992).

With Weidner and Vincent’s (1992) conclusion that both the internship and approved curriculum routes adequately prepared students in mind, one should examine a study that looked at this question directly. Starkey and Henderson (1995) published results from a study that examined whether or not the route to eligibility resulted in different scores on the three sections of the athletic training certification examination. The authors collected certification testing data over two consecutive calendar years. Starkey and Henderson’s (1995) t-test analyses of examination scores revealed several significant differences. The authors observed that the candidates who went through the approved curriculum certification route scored significantly higher on all three sections of the certification examination. While the authors discussed several reasons that may have led to the decrease in scores for the internship route, Starkey and Henderson (1995) clearly observed that the internship route resulted in a lower passing rate for each examination section. This information is important for athletic training education because partially due to this perceived lack of preparation by the internship route, athletic trainers currently have only one route to certification, the accredited professional ATEP.

Kugler (1994) examined professional preparedness and athletic training careers were examined through selection of a sample of athletic trainers from one year of the
BOC certification examination candidates. The author’s sample included individuals who were certified in 1985. Of the 600 surveys mailed out, 224 were returned. The author examined the respondents’ personal and professional background as well as the perception of their professional preparation. Ultimately, no significant differences were found between undergraduate programs in athletic training with regard to preparation in major task areas and core courses. The author did however report low ratings of adequate preparation in the areas of organization and administration, and counseling, guidance, and education (Kugler, 1994). The author also noted poor preparation ratings for several core courses. These courses included sports psychology, drug education, motor behavior, and computer training (Kugler, 1994).

Student perceptions

Massie (2003) reported his study to be the first to assess educational programs from either the student perspective or across all five practice domains of athletic training. With that said Massie’s purpose was three fold. The first purpose was to determine if students were being prepared for an entry-level athletic training position. The second purpose looked into whether there were areas of deficiency with regard to the five practice domains defined in the 3rd edition of the Role Delineation Study. The final purpose of this study was to examine the influence of program type on professional preparation (Massie, 2003). A single year, 1998, of successful candidates passing the certification exam was selected as the sample for this study. Of the 426 surveys mailed out, the author reported a 38% response rate. Massie (2003) developed a unique instrument in which the first part of the survey assessed demographic and personal data. The second part of the survey utilized a four point scale. This scale was used to assess
questions regarding professional preparedness. Respondents were asked separately if they thought their educational program and clinical education adequately prepared them for entry into the profession. This second part of the survey also included an open ended question which asked whether or not there were aspects of the respondent’s job that could not be learned anywhere but on the job. The third and final portion of the survey used a 5-point Likert scale to assess thirty four statements which represented the five domains of athletic training. For this section, subjects were asked which response best represented their preparedness. Descriptive statistics were run for the first two sections of the survey. These revealed that only 1.8 percent of respondents felt that their academic program did not prepare them and that 0.6 percent felt that the clinical portion of their education did not prepare them. To address the third section of the survey, Massie (2003) used the thirty four individual questions to create one mean score for each of the domains. Massie then performed a multivariate analysis of variance (MANOVA) to ascertain if there were any differences between the approved program group and the internship group with respect to the five practice domains. The MANOVA revealed only one practice domain to be perceived different between the two groups. The curriculum based group felt better prepared when it came to professional development and responsibility (Massie, 2003). The author concluded that graduates from curriculum based programs perceived their professional preparation to be more satisfactory than the candidates from the internship route to certification (Massie, 2003).

Massie’s survey instrument (2003) was later used by Whitman (2008). Whitman’s study focused on the perception of athletic training students’ towards the academic preparation their ATEP provided. The main focus of the study was to inspect whether or
not professional ATEPs were adequately preparing athletic training students for the 
Board of Certification Examination. A quantitative approach was taken and students were 
given a questionnaire with two multiple choice questions and thirteen Likert scale items. 
The author surveyed a sample of respondents who had either graduated or were preparing 
to graduate from accredited ATEPs. Every participant had previously sat for a portion of 
the BOC examination. Whitman’s (2008) survey was adapted from a previous survey 
used by Massie (2003). The modification included a change from assessment of BOC 
domains to an examination of the NATA content areas Whitman (2008) ran student t-
tests to examine whether or not students felt prepared for the BOC certification 
examination by their athletic training education and clinical experiences. With a 62.3 
percent response rate, Whitman (2008) reported that 19.3 percent of respondents felt 
excellently prepared for the BOC examination, 42 percent felt that the preparation was 
above average, and 26.3 percent reported average preparation. On the other end, 9.5 
percent felt fairly prepared while just 2.9 percent of respondents reported being poorly 
prepared. While these results examined the entire picture of academic preparation, 
Whitman (2008) also utilized five point Likert-scale items to examine preparedness in 
each of the 12 content areas listed in the NATA Athletic Training Educational 
Competencies (1999) as well as a thirteenth area which the author titled behaviors of 
professional practice. Whitman (2008) reported that the areas were students felt the most 
adequately prepared included Risk Management and Injury Prevention, Pathology of 
Injuries and Illness, Orthopedic Clinical Exam and Diagnosis, and Acute Care of Injury 
and Illness. Respondents felt least prepared in the domains of Psychosocial Intervention 
and Referral, Nutritional Aspects of Injury and Illness, and Health Care Administration.
Pharmacology was the only domain area that respondents reported their preparation to be “extremely inadequate” (Whitman, 2008, p. 40).

Employer perceptions

Massie, Strang, and Ward (2009) continued the examination of NATA content areas when they examined the academic preparation of entry-level certified athletic trainers. Rather than focusing on student perceptions, this study examined employers’ perceptions on academic preparation. Massie et al. (2009) utilized an online survey to assess employers’ satisfaction of the academic preparation of entry-level athletic trainers. These employers’ perceptions were also used to identify potential inadequacies of the athletic training curriculum. The instrument asked employers to evaluate overall didactic and clinical preparation of their employees with a four point scaled item. Then, thirty four statements were assessed on a five point Likert scale. These statements represented specific NATA educational competencies and clinical skills. However, twenty-eight of the 34 statements were designed to represent the six practice domains found in the BOC Role Delineation Study while the remaining six statements were used to evaluate professional and communication skills (Massie et al., 2009). With just a six percent response rate, Massie et al. (2009) reported that only 35 of the 104 who responded completed section two of the survey, which used the 34 statements to assess the BOC domains. With this limited return Massie et al. (2009) analyzed data with Cronbach’s alpha and structural equation modeling. Results from this study revealed that 90 percent of employers felt that their employees were prepared didactically and clinically (Massie et al., 2009). The employers’ higher satisfaction, with respect to the domains of knowledge, occurred in Risk Management and Immediate Care while the lowest
satisfaction occurred in Organization and Administration (Massie et al., 2009, p. 71). When all data from the second section of the survey were collapsed into one, it was observed that the employers’ level of satisfaction of entry-level athletic trainers was “good”.

Athletic trainers’ perceptions

One of the most recent studies to examine perceptions of academic preparation was conducted by Donahue (2009). Donahue (2009) surveyed athletic trainers to assess their perception of the importance, preparation, and time spent in the athletic training content areas. One hundred athletic trainers were selected from the seven largest employment settings for athletic trainers. Of the 700 surveys mailed, 32.2 percent were returned (Donahue, 2009). This sample of athletic trainer’s represented many different ages, levels of education, years certified, and routes to certification. The survey was developed to assess the 12 content areas with regard to five questions. Respondents were asked to rank each of the content areas from one to five with reference to level of importance, amount of time spent in performing tasks, most important for patient care, level of preparation when first certified, and preparing future athletic trainers. Sixty, one-way ANOVA’s were used to compare the seven group means with reference to the 12 content areas (Donahue, 2009). An alpha of 0.01 was used in these analyses. Donahue (2009) ran Fisher’s LSD as a post hoc analysis to determine differences within groups where a statistically significant ANOVA was observed. With regard to academic preparation, Donahue (2009) observed that there was no significant difference in preparation between the seven work settings. Donahue (2009) further divided the data into internship and accredited program route to certification and reported that athletic
trainers who completed accredited programs perceived themselves to be better prepared in the content areas of Assessment and Evaluation and Therapeutic Modalities (Donahue, 2009). With the compiled data, Donahue (2009) reported high ratings in Assessment and Evaluation and Acute Care of Injury and Illness. Low ratings, below 3.0 on a five point scale, were reported for the content areas of Pharmacology, General Medical Conditions and Disabilities, Nutritional Aspects of Injury and Illness, Psychological Intervention and Referral, Health Care Administration, and Professional Development and Responsibilities (Donahue, 2009). Donahue (2009) reported that data from this study are similar to those found by Weidner and Vincent (1992).

**Summary of Professional Preparation**

The perceived level of athletic training students’ academic preparedness has been examined with several different approaches. While there have been many observations made through these analyses, there still remains a void. Several authors observed inadequate or low perceptions about academic preparation in certain areas (Kugler, 1994; Massie, Strang, & Ward, 2009; Misasi, Davis, Morin, & Stockman, 1996; Stiller-Ostrowski & Ostrowski, 2009; Whitman, 2008), while others reported adequate perceptions of overall academic preparation (Donahue, 2009; Gieck, Lephart, & Saliba, 1986; Massie, 2003; Massie, Strang, & Ward, 2009; Weidner & Vincent, 1992; Whitman, 2008). When addressing academic preparation, some studies examined differences in academic preparation between the two different routes to certification (Donahue, 2009; Gieck, Lephart, & Saliba, 1986; Massie, 2003; Starkey & Henderson, 1995; Weidner & Vincent, 1992). The observations from these studies provide valuable information but the internship route has not been a valid route to certification since 2004.
Misasi, Davis, Morin, and Stockman (1996), Stiller-Ostrowski and Ostrowski, (2009), and Kugler (1994) observed a perceived lack in preparation within the general domain of Psychosocial Intervention and Referral or specifically in the skill of counseling. Misasi et al. (1996) surveyed employed athletic trainers who reported being unprepared by their educational programs for racial issues, suicide, financial issues, and alcohol problems. Similarly, Stiller-Ostrowski and Ostrowski, (2009) observed a perceived lack in preparation in the domain of Psychosocial Intervention and Referral through semi-structured interviews with certified athletic trainers. Finally, Kugler (1994) reported that certified athletic trainers perceived low ratings for preparation in the general areas of counseling, guidance, and education. Kugler (1994) also reported low ratings for perceived preparedness in the domain of Organization and Administration. A similar result was observed by Massie, Strang, and Ward (2009). While Massie et al. (2009) reported that 90 percent of employers felt that their athletic trainer employees were satisfactorily prepared overall, Organization and Administration was the area of least satisfaction. Similar to Massie et al. (2009), Whitman (2008) reported overall satisfaction with academic preparation with the only specific area of inadequate preparation being Pharmacology.

Another area of research that garnered attention involved the difference in perception of academic preparation between internship route athletic trainers and curriculum route athletic trainers. While all of the following studies reported overall satisfaction with academic preparation, there were some conflicting results when examining preparation between the two groups. Gieck, Lephart, and Saliba (1986) first examined these two groups and reported that the perceived level of academic preparation
was independent of group. In other words, the perceptions did not differ between the internship and curriculum routes to certification. Weidner and Vincent (1992) reported similar results when they observed that there was no difference in perceived preparedness between athletic trainers who went through either an internship or curriculum based education. In opposition to the above findings, Massie (2003) observed that curriculum students felt prepared better than the students who went through the internship route. Donahue’s (2009) results were similar to Massie (2003) in that athletic trainers who graduated from approved curriculums were better prepared in the specific areas of Assessment and Evaluation and Therapeutic Modalities. While these results are interesting, there is less importance on these two groups because the only current route to certification is through graduation from an accredited professional ATEP.

While the results of the above studies seem to have provided sound evidence, it is also important to examine the design and methodology that was utilized to obtain these results. Overall, the question of academic preparation has been addressed through a few different designs and methodologies. Students, employed athletic trainers, and employers have all been surveyed. The survey instruments have addressed either one individual domain/content area or all domains/content areas. Only two studies (Massie, Strang, & Ward, 2009; Whitman, 2008) have attempted to assess the 12 content areas as well as some of the specific competencies that make up those 12 areas. These two studies, along with the other studies examined above, provide evidence related to the academic preparation of an athletic trainer. Even with this evidence there lacks a complete and comprehensive analysis of the problem in one research study.
To examine this problem and the questions related to academic preparedness, a study might survey entry-level athletic training professionals who represent the current educational practices that are enforced through the NATA, BOC, and CAATE. This sample could be used to assess their perception of academic preparedness in each of the 12 content areas, and academic preparedness in the specific competencies that define the content areas. Along with demographic information, this will provide a comprehensive examination of the perception of academic preparedness of certified athletic trainers.

Summary

Chapter two has provided a comprehensive examination of the literature related to the current educational structure of professional ATEPs. This chapter has also provided a critique of the current literature related to the academic preparation of entry-level athletic trainers as they enter the profession. While this body of literature has provided valuable evidence, there lacks a comprehensive examination based on current educational standards. It is through an understanding of the current educational structure that one can construct a comprehensive examination of the adequacy of current professional athletic training education, as perceived by entry-level athletic training professionals. Chapter three outlines the methods designed to guide this examination.
CHAPTER 3: METHODS

Introduction

Chapter 3 describes the methods that were employed to complete this study. Chapter three is divided into nine sections. These sections include introduction, research design, research questions, identifying the population, sampling procedure, instrument development, pilot study, data collection, data analysis, and summary.

The primary purpose of this study was to investigate the perceived adequacy of professional athletic training education. A survey instrument was specifically designed for this study to assess these perceptions of professional educational adequacy. To examine the primary purpose, the self-perceived adequacy of academic preparation in each of the 12 educational content areas was assessed. The survey consists of 12 scales constructed with 4 to 6 related educational competencies from each of the 12 content areas.

Currently, all professional athletic training programs must adhere to the CAATE standards which require that the NATA Athletic Training Educational Competencies be taught and assessed in their curriculum. With only one set of general guidelines, there are currently professional education programs at two different degree levels: baccalaureate and masters. To explore the primary purpose further, self-perceptions about educational adequacy were examined for both the masters and baccalaureate graduates.

Research Design

This study employed a non-experimental design in which a 2 x 12 between-within repeated measures ANOVA was performed. This design allowed between groups factors, within group factors, and the presence of an interaction of the between and within factors.
of academic preparedness to be examined between masters and baccalaureate graduates (between groups factor) of professional ATEPs. Secondly, this design afforded the researcher the ability to examine perceptions of academic preparedness across the 12 educational content areas (within group factors). The final advantage to this design was the ability to observe any interaction between the two groups and the 12 content areas.

Research Questions

RQ1: Do employed entry-level athletic training professionals who have graduated from a professional masters program perceive their academic preparation differently than employed entry-level athletic training professionals who graduated from a professional baccalaureate program?

RQ2: Do employed entry-level athletic training professionals perceive their athletic training education the same in the 12 educational content areas designated in the 4th edition of the NATA Athletic Training Educational Competencies?

RQ3: Is there an interaction between the independent variable (professional education) and the 12 educational content areas as dependent variables?

Null Hypotheses

H_{01}: There will be no significant difference in global perceptions of academic preparedness between the professional masters (m) and professional baccalaureate (b) groups.

H_{01}: \mu_m = \mu_b

H_{02}: There will be no significant difference in the perceptions of academic preparedness across all 12 educational content areas (1-12).

H_{02}: \mu_1 = \mu_2 \ldots = \mu_{12}
H\textsubscript{03}: There will be no interaction between the independent and dependent variables.

More specifically, no significant interaction will be observed between the masters group and the baccalaureate group in each of the 12 content areas.

H\textsubscript{03}: \( \mu_{m1} - \mu_{b1} = \mu_{m2} - \mu_{b2} \ldots = \mu_{m12} - \mu_{b12} \)

Identifying the Population

Previous literature in the area of academic preparedness reported observations based on samples of the entire athletic training population. Subsequently these studies included athletic trainers who were educated in a variety ways. While these observations provided valuable evidence, it was not the intent of this study to generalize perceptions to all athletic trainers. The intent of this study was to examine the current educational preparation of entry-level athletic trainers who are within the first four years of employment. The assurance of uniform educational content can be made when sampling athletic trainers within four years of graduation. Thus, to best assess educational preparation during the completion of this study, the population should entail all athletic trainers who graduated and became certified athletic trainers under the same educational policies.

There are two primary documents that could have been used when identifying the timeline of the population, the RDS and the NATA Athletic Training Educational Competencies. The RDS is partially conducted to identify the current job roles and define the necessary minimal knowledge and skill for entry-level practice as an athletic trainer (NATA Educational Competencies, 2006). Most importantly, the RDS validates the content of the BOC’s certification examination. The RDS is not intended to provide an educational framework. While the RDS does provide current information, the NATA
Athletic Training Educational Competencies encompass the knowledge and skills for both current and future practice (Gardner, Koehneke, & Brown, 2011). It is through the inclusion of current and future knowledge and skills that the NATA educational competencies exceed the RDS. Simply put, the NATA educational competencies are “broader and more specific than the knowledge and skills presented in the RDS” (Athletic Training Educational Competencies, 2006, p. 1). Also, the specific intention of the educational competencies is to provide guidance to educational programs as they form “all facets of the education experience for students” (Athletic Training Educational Competencies, 2011, p. 4). It is clear, after examination of the two documents, that the publication timeline of the educational competencies should be used as a guide to identify an appropriate population. The RDS and educational competencies are updated every five years and thus selection of the current educational competencies allows this study to identify a population of entry-level athletic training professionals who were all educated using the same educational baseline.

The population, from which this study’s sample was taken, encompasses all athletic trainers who graduated from an accredited professional athletic training education program between the 2006-2007 and 2010-2011 academic years. This time frame identifies a population in which all potential subjects were educated and certified based on the 4th edition of the NATA Athletic Training Educational Competencies.

Sampling Procedure

Identifying the Sample

The Board of Certification (BOC) administers the certification examination during five two-week testing windows from March first of one year to the end of
February the next year (Johnson, 2010). Individuals who, for the first time, sat for and passed the BOC certification examination between June 2007 and February 2010 were initially identified for this study. However, due to an error by the BOC during the selection of the sample, the actual timeframe used in this study was June 2007 to November 2011. The error is described in the Data Collection section of this chapter.

The identified time range was chosen for several reasons. The 4th edition of the NATA Athletic Training Educational Competencies was published in 2006. In 2005, the Joint Review Committee on Athletic Training Education (JRC-AT) called for the implementation of the 4th edition of the competencies with the 2006-2007 cohort of freshmen students (JRC-AT Meeting Minutes, 2005). The JRC-AT (2005) also noted that all individuals in the program should be assessed by the 4th edition of the competencies by 2009-2010. Graduates during the selected timeframe were educated via the 4th edition of the competencies. With this understood, those individuals who passed the exam and attained the professional credential from June 2007 to November 2011 have been a certified athletic trainer between one and four years. These individuals also represent entry-level athletic trainers educated under the 4th edition of the NATA Athletic Training Educational Competencies.

Selection of Sample Size

To determine how many subjects would be invited to participate in this study, an a priori power analysis was performed. The power analysis performed with the G-Power program allowed the researcher to identify the minimum number subjects needed to reach adequate statistical power. To perform this a priori analysis there are three variables that must be examined. The first variable to consider is Type I error. Type I error is
represented by alpha (α) level. For this study, an a priori α (or significance level) of 0.05 was selected. By selecting α=0.05, there is a five percent chance of committing a Type I error which would include rejecting the null hypothesis when it is actually true. A second variable that was considered is the effect size or eta squared (η²). Effect sizes for η² can range from small (.1) to medium (.25) or large (.4) (Newton & Rudestam, 1999). In the related literature, there is not consistent data on effect size as it relates to the topic of this study. Therefore, a conservative medium effect of η² = 0.25 was assumed. The final variable to consider when determining adequate sample size is the probability of committing a Type II error. Committing a Type II error will result in accepting a null hypothesis that is actually false. Type II error is measured as β and then transformed into power (1-β). This transformation of β into 1-β provides the probability of making a correct decision when either accepting or rejecting a null hypothesis. To provide a conservative estimate, 1- β = .95 was used when running the power analysis. This means that the analysis provided the minimum participants needed to achieve 1-β = 0.95 with α = 0.05 and a medium effect estimated. Running the analyses with 1-β = .95 actually afforded the opportunity to potentially detect an effect smaller than the estimated medium. In general, the estimated sample provides a 95% probability that a decision to reject or accept the null hypothesis was correct.

This study examined between factors, within factors, and the interaction of the between and within factors. To estimate sample size three power analyses needed to be run. All three power analyses were run using α=0.05, 1-β=0.95, and η² = 0.25. The power analysis for between factors required the largest sample size with an estimate of 116
participants. With this information, a total of 1,000 were invited to participate in the study.

Instrument Development

A survey instrument was specifically designed for this study (Appendix A). This instrument was divided into two main sections: 1) the demographics of the respondents and 2) the respondents’ perceptions of the adequacy of their professional athletic training education.

Demographics

Respondents voluntarily reported their athletic training employment setting (college/university staff, college/university faculty, college/university graduate assistant, professional sports, secondary school, hospital/clinic, industrial/occupational, military, performing arts, physician extender, health safety, other athletic training setting, and other non-athletic training position). This question served as the first guard to include or exclude respondents from the study. Any respondent who selected the “other non-athletic training position” option was excluded from the study. Respondents also reported the school year they sat for and passed the BOC certification examination (2007-2008, 2008-2009, 2009-2010, other). This is the second response that served to include or exclude a participant from the study. Only subjects who graduated and passed the exam during the 2007-2008, 2008-2009, or 2009-2010 were included in the study. This limitation was applied to ensure respondents were educated via the 4th edition of the NATA Educational Competencies. Respondents also reported whether their professional athletic training program was at the baccalaureate or the masters level. Finally, respondents reported how many months of experience they had as a certified athletic trainer and their highest level
of education completed (professional baccalaureate, professional masters, postprofessional masters in athletic training, post-professional masters other than athletic training, clinical doctorate, or PhD).

Perceptions on the Adequacy of Professional Athletic Training Education

The NATA Athletic Training Educational Competencies identify 12 content areas that are incorporated into athletic training curricula. Each of the 12 content areas outlined in the NATA Athletic Training Educational Competencies document has associated competencies. These competencies represent the minimum knowledge and skills that must be mastered prior to entry-level practice as an athletic trainer (Athletic Training Educational Competencies, 2006). To ensure mastery of the basic skills has been achieved, the competencies are assessed by professional ATEPs.

The survey instrument created for this study (Survey of Athletic Trainers’ Educational Preparation) made use of the competencies to create a scale that assessed the respondents’ self perceptions of their academic preparation. Four to six competencies from each of the 12 content areas were used to create the scale to measure each of the 12 content areas.

To increase the validity of the instrument, a panel of five athletic training educators was asked to help in the selection of the competencies used in this study. Each athletic training educator was emailed a document that contained all 12 content areas. In the document, the competencies of each content area were subdivided into four to six groups. The educators were asked to rank the top two or three competencies in each grouping based on criticality. The most important competency of each group was ranked with a one.
Results from the content validation process were compiled and the most important competency from each group was included in the survey. Most of the 12 content areas included five different groups of competencies and thus five competencies were used to create the scale. However, due to a large number of competencies, six competencies were used to create the scale for the health care administration content area. Conversely, due to the low number of competencies, four competencies were used to create the scale for the pathology of injuries and illnesses content area.

To assess the respondents’ perceptions on the selected competencies, a self report five point scale (excellent, good, adequate, poor, inadequate) was used. Prior to completing the items, respondents were asked to reflect on their professional education. For each item, respondents were asked to report how well they perceived their professional program prepared them. For example, respondents were asked to respond to a question such as: How well did my entry-level athletic training education program provide knowledge of the systems of the human body? Respondents read the item and then rated how well they perceived their ATEP performed based on the five point scale. With 12 content areas and five competencies per content area, there was a total of 60 items that respondents reported self perceptions. The competencies that were used to create the survey instrument are found in Appendix B.

*Instrument Validity*

The instrument was examined for content and construct validity. Inspecting the validity provides some confidence that the instrument measures what it is designed to measure (Arnold, Gansneder, & Perrin, 2005). Examining for validity allows the results to be generalized to more than just the study sample. To ensure that the content of survey
instrument was appropriate, a group of five athletic training educators were contacted and asked to help identify the competencies that should be included in the survey instrument. This process was explained in the preceding paragraphs.

Construct validity was also assessed. According to Warner (2008), construct validity relates to the degree at which the scores of a measure correspond to the construct that the measure is designed to have. This survey included 60 items that were divided into 12 scales which match the 12 content areas. Upon completion of data collection, an exploratory factor analysis was performed to assess construct validity of the survey instrument. Results from the exploratory factor analysis can be found in Chapter 4.

Reliability

Instrument reliability refers to the ability of an instrument to be repeated under constant conditions (Arnold, Gansneder, & Perrin, 2005). The internal consistency reliability should also be assessed when examining a multiple-item scale (Warner, 2008). The competencies that were randomly selected above should provide a reliable measure of the related content area. This assumption was examined with the Cronbach alpha reliability coefficient. This reliability measure provides data on how well the multiple items measure some variable (Warner, 2008). In this case, the Cronbach alpha coefficient was used to examine homogeneity of the selected competencies. Reliability data are reported in the description of the pilot study and in chapter 4.

Pilot Study

A pilot study was performed to assess reliability of the instrument. The pilot study utilized participants from two CAATE accredited professional ATEPs. A list of graduates from the 2010-2011 academic school year was obtained from the program director of
each institution. The 2010-2011 academic year was selected to ensure these students were not in the sample for the full study. Students were allowed to participate regardless of certification standing. Thirty five participants were sent an email with an invitation to voluntarily complete the survey instrument. Twenty six respondents started the survey but only 21 completed. This yielded a response rate of 60% for those who completed the survey. Data for one respondent was incomplete with more than half of the survey questions omitted. Data were removed for this respondent which left data from 20 respondents. The Cronbach alpha reliability coefficient was calculated for each of the 12 scales. Table 1 provides data for reliability of the 12 content areas.
Table 1

<table>
<thead>
<tr>
<th>Scale</th>
<th>Cronbach α</th>
<th>Number of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>DI</td>
<td>.664</td>
<td>5</td>
</tr>
<tr>
<td>AC</td>
<td>.738</td>
<td>5</td>
</tr>
<tr>
<td>RM</td>
<td>.473</td>
<td>5</td>
</tr>
<tr>
<td>EX</td>
<td>.622</td>
<td>5</td>
</tr>
<tr>
<td>TM</td>
<td>.746</td>
<td>5</td>
</tr>
<tr>
<td>NU</td>
<td>.637</td>
<td>5</td>
</tr>
<tr>
<td>MC</td>
<td>.728</td>
<td>5</td>
</tr>
<tr>
<td>PS</td>
<td>.755</td>
<td>5</td>
</tr>
<tr>
<td>AD</td>
<td>.789</td>
<td>6</td>
</tr>
<tr>
<td>PD</td>
<td>.808</td>
<td>5</td>
</tr>
<tr>
<td>PA</td>
<td>.831</td>
<td>4</td>
</tr>
<tr>
<td>PH</td>
<td>.919</td>
<td>5</td>
</tr>
</tbody>
</table>

$\textit{n} = 20$

Data Collection

Prior to data collection, approval for this study was acquired through the Ohio University Institutional Review Board. Upon approval, an email list consisting of 1,000 names was generated from BOC testing date information. Through correspondence with the BOC, it was initially identified that 3,205 candidates sat for and passed the
certification examination on their first attempt between June 2007 and February 2010. Of these candidates, 2,986 graduated from a professional baccalaureate program and 219 graduated from a professional masters program. Due to the disparity in groups, all 219 individuals who graduated from a professional masters program were included in sample. The remainder of the sample consisted of a random selection of 781 individuals who graduated from a professional baccalaureate program.

After purchasing contact information, the web-based instrument was distributed by the BOC. One week prior to receiving an invitation to the survey, an informational email (Appendix C) was sent to the 1,000 potential respondents. Due to a change in the BOC’s software at the time of this study, 135 of the 1,000 informational emails were sent to the incorrect person. After identifying this problem, the BOC identified the correct information for all but 36 of the 135 incorrect emails. To replace the 36 incorrect emails, the BOC randomly selected 36 individuals who sat for and passed the BOC certification examination on their first attempt after February 2010 but before November 2011. This resulted in the final date range of the sample being June 2007 to November 2011. After correcting the error, the BOC sent the informational email to the 135 recipients four days prior to the survey invitation email (Appendix D).

The informational email notified respondents that they would soon be asked to participate in a voluntary study. Potential respondents were educated on the purpose of the study in this email. This email was intended to increase the response rate due to the fact that potential respondents would be expecting the survey invitation email.

One week after the informational email was sent; the BOC sent an email on the researchers’ behalf inviting potential respondents to participate in this study. Respondents
were informed that their participation was voluntary and that any information they provided would remain confidential. The email included a webpage link that directly linked them to the web-based survey instrument. To further generate an increased response rate, three follow-up emails were sent to the entire sample. These emails were sent two, four, and six week after the initial email. After eight weeks, the survey was closed and data were analyzed.

Data Analysis

Data were processed with SPSS version 19. All data were analyzed with a 2x12 between-within repeated measures analysis of variance (ANOVA). The between factors portion of the repeated measures analysis addressed research question one. Research question two was examined through the within factors section of the repeated measures ANOVA. Finally, the between-within repeated measures ANOVA afforded the potential to identify any possible interaction effect in the two between factors and the 12 within factors. This portion of the analysis addressed research question three.

Summary

Chapter three described the proposed methods that were used to complete this study. This study used a non-experimental design in which a between-within factors ANOVA was performed to examine the three research questions. In general, the purpose of this study was to investigate the adequacy of current professional athletic training education. In order to examine the current educational practices, this study identified a population of athletic trainers in which all potential participants graduated and were educated utilizing the same educational competencies. A sample of 1,000 individuals
who, sat for and passed the BOC certification exam the first time during the testing period from June 2007- November 2011 were invited to participate in this study.

Potential respondents were invited to complete a survey instrument that was specifically designed for this study. The survey instrument was organized into two main sections. The first section inquired about demographic information which served to include or exclude the respondent from the study. The second section utilized 60 items to assess the respondents’ perceptions of how well their professional ATEP prepared them for entry into the profession. The 60 items were selected with input from a panel of athletic training educators. These items created a scale to measure the overall perception for each related content area. After data collection was complete, the between-within repeated measures ANOVA was run. Results are reported in chapter four.
CHAPTER 4: RESULTS

Introduction

This study examined entry-level professionals’ self-perceptions of their athletic training education through a web based survey. Three research questions guided this study. The first research question addressed whether or not entry-level athletic trainers who graduated from a professional masters program perceived their academic preparation differently than entry-level athletic trainers who graduated from a professional baccalaureate program. The second research question examined how employed entry-level athletic training professionals perceived their athletic training education in each of the 12 educational content areas designated in the 4th edition of the NATA Athletic Training Educational Competencies. The final research question assessed if there was an interaction between the independent variable (professional education) and the 12 educational content areas as dependent variables.

The findings associated with the three research questions are presented in six sections of this chapter. The first section reports the survey response rates while the second section describes the procedures used to screen the data. The third section summarizes demographic information gained from the survey respectively. Reliability and validity of the survey instrument are reported in sections four and five. The final section reports the results from hypothesis testing of the three research questions.

Response Rate

Of the 1,000 invitations sent to potential respondents, 268 voluntarily started the survey, for an initial response rate of 26.8%. Of those respondents, three opted out of the survey. This reduced the respondent pool to 265. Of those, 222 finished the entire survey
by clicking the submit button at the end of the survey. Data for these 222 respondents were then screened.

Data Screening

Before hypothesis testing was conducted, data were screened to ensure the sample matched the population identified in the previous chapter. Data were also screened for missing values, outliers and sphericity with respect to the 12 measures.

Demographic questions were examined for the 222 respondents to ensure the sample matched the identified population. Of the 222 respondents, 36 identified themselves as not currently employed as an athletic trainer. The research questions of this study address employed entry-level athletic trainers and thus these individuals did not fit the description and were eliminated from the study. Upon further examination, four respondents reported a certification date outside of the identified range. These respondents were certified for less than one year, which did not fall within the identified range (certified one to four years). It was for these reasons that the 40 cases were removed. This resulted in a total of 182 respondents with usable data.

Missing Values

Missing values were observed for select cases, and then evaluated. None of the 60 items in section two of the survey had more than five missing values. No discernible pattern was observed in the missing variables. While examining for missing variables, it was observed that one respondent reported “excellent” to all 60 questions in section two of the survey. Statistical analyses were run with and without this case. These separate analyses allowed the researcher to examine the effect of this case. There was no
observable impact to the final output. Therefore, the case was included in the final analysis.

**Outliers**

To examine for outliers, data were screened via examination of z-scores for items. There were three responses from respondents with z-scores greater than four. The three respondents’ responses were examined separately and there was no apparent error or pattern in the respondents’ scores. However, analyses were run with and without the three outliers. Removal of the outliers did not alter the outcome of the final analysis. Therefore, outliers were not removed from hypothesis testing.

**Sphericity**

The sphericity assumption was assessed with Mauchly’s test (Warner, 2008). This test was statistically significant: Mauchly’s $W = 0.187, \chi^2(65) = 294.85, p = 0.000$. The null hypothesis was rejected and data were not assumed spherical. Since data cannot be assumed spherical, the F statistic, with a Greenhouse-Geisser adjustment, was evaluated for the test of within-subjects effects and the interaction effect. These components of the 2x12 between-within repeated measures ANOVA relate to research questions two and three respectively.

**Demographics**

Of the 182 usable respondents, 63 were male and 119 were female. A total of 144 (79.1%) respondents reported their professional athletic training education program at the baccalaureate level. There were 38 (20.9%) respondents who reported attending a professional masters athletic training education program. Eighty respondents reported
taking the certification exam during the 2007-2008 testing year. Sixty-nine respondents reported taking the exam during the 2008-2009 testing year and 33 reported the 2009-2010 testing year. Table 2 provides the demographic information on employment of respondents and Table 3 provides demographic information on the highest level of education completed by the respondents.

Table 2

<table>
<thead>
<tr>
<th>Employment Demographics</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>College/University Staff</td>
<td>51</td>
<td>28</td>
</tr>
<tr>
<td>College/University Faculty</td>
<td>3</td>
<td>1.6</td>
</tr>
<tr>
<td>College/University Graduate Assistant</td>
<td>7</td>
<td>3.8</td>
</tr>
<tr>
<td>Professional Sports</td>
<td>2</td>
<td>1.1</td>
</tr>
<tr>
<td>Secondary School</td>
<td>64</td>
<td>35.2</td>
</tr>
<tr>
<td>Hospital/Clinic</td>
<td>21</td>
<td>11.5</td>
</tr>
<tr>
<td>Industrial/Occupational</td>
<td>3</td>
<td>1.6</td>
</tr>
<tr>
<td>Military</td>
<td>4</td>
<td>2.2</td>
</tr>
<tr>
<td>Physician Extender</td>
<td>5</td>
<td>2.7</td>
</tr>
<tr>
<td>Other Athletic Training Position</td>
<td>22</td>
<td>12.1</td>
</tr>
</tbody>
</table>

\( n = 182 \)
Table 3

Demographics on the Highest Level of Education Completed

<table>
<thead>
<tr>
<th>Setting</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry-level bachelors</td>
<td>53</td>
<td>29.1</td>
</tr>
<tr>
<td>Entry-level Masters</td>
<td>41</td>
<td>22.5</td>
</tr>
<tr>
<td>Post-professional masters in athletic training</td>
<td>36</td>
<td>19.8</td>
</tr>
<tr>
<td>Post professional masters other than athletic training</td>
<td>44</td>
<td>42.2</td>
</tr>
<tr>
<td>Clinical doctorate</td>
<td>8</td>
<td>4.4</td>
</tr>
</tbody>
</table>

\[ n = 182 \]

Reliability

Reliability of the 12 scales found within the Survey of Athletic Trainers’ Educational Preparation was assessed via the Cronbach alpha reliability coefficient. Results from this assessment are found in Table 4. According to Nunnaly (1978), 0.7 is an acceptable reliability coefficient for the Cronbach alpha reliability coefficient. Reliability coefficients greater than 0.7 were observed for each of the 12 scales.
Table 4

*Cronbach alpha reliability coefficients*

<table>
<thead>
<tr>
<th>Scale</th>
<th>Cronbach $\alpha$</th>
<th>Number of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>DI</td>
<td>.819</td>
<td>5</td>
</tr>
<tr>
<td>AC</td>
<td>.861</td>
<td>5</td>
</tr>
<tr>
<td>RM</td>
<td>.711</td>
<td>5</td>
</tr>
<tr>
<td>EX</td>
<td>.897</td>
<td>5</td>
</tr>
<tr>
<td>TM</td>
<td>.842</td>
<td>5</td>
</tr>
<tr>
<td>NU</td>
<td>.813</td>
<td>5</td>
</tr>
<tr>
<td>MC</td>
<td>.847</td>
<td>5</td>
</tr>
<tr>
<td>PS</td>
<td>.814</td>
<td>5</td>
</tr>
<tr>
<td>AD</td>
<td>.842</td>
<td>6</td>
</tr>
<tr>
<td>PD</td>
<td>.808</td>
<td>5</td>
</tr>
<tr>
<td>PA</td>
<td>.768</td>
<td>4</td>
</tr>
<tr>
<td>PH</td>
<td>.862</td>
<td>5</td>
</tr>
</tbody>
</table>

$n = 182$

Validity

Content validity of the Survey of Athletic Trainers’ Educational Preparation was established in Chapter Three. Athletic training educators were included in the development of the survey to ensure the content was appropriate. This was achieved
through their selection of the five most important competencies in each of the 12 content areas identified within the NATA Athletic Training Educational Competencies.

The survey was then constructed with the selected competencies. Based on the makeup of the content areas, each group of five competencies were used to create a scale of the related content area. This resulted in a total of 12 scales. An exploratory factor analysis of the 60 selected competencies was performed to assess the validity of this construct. Through the factor analysis, 12 components were observed within the 60 items. Many of the items loaded on the first component and there was noteworthy cross loading of the items. With most items loading on the first component, the data provide evidence of a global measure and not necessarily 12 different scales.

Hypothesis Testing

A 2x12 between-within repeated measures ANOVA was the primary statistical procedure used to address the three research questions. The following section reports the results of this procedure and any pertinent post hoc testing performed for each research question.

Research Question 1

RQ1: Do employed entry-level athletic training professionals who have graduated from a professional masters program perceive their academic preparation differently than employed entry-level athletic training professionals who graduated from a professional baccalaureate program?

The null hypothesis for RQ1 is: There will be no significant difference in global perceptions of academic preparedness between the professional masters (m) and professional baccalaureate (b) groups ($H_{01}: \mu_m = \mu_b$). No main effect was observed for the
between factor comparison \(F(1, 182) = 3.35, p = 0.069\). Therefore, a decision of fail to reject the null hypothesis was made. There is no statistical difference in self-perceived academic preparation between those who graduated from an professional masters or baccalaureate program. Figure 1 provides a graphical representation of the masters and baccalaureate groups across all 12 content areas.

Figure 1. Comparison of Professional Masters and Baccalaureate Groups
Research Question 2

RQ2: Do employed entry-level athletic training professionals perceive their athletic training education the same in the 12 educational content areas designated in the 4th edition of the NATA Athletic Training Educational Competencies?

The null hypothesis for RQ2 is: There will be no significant difference in the perceptions of academic preparedness across all 12 educational content areas ($H_{02}$: $\mu_1 = \mu_2 \ldots = \mu_{12}$). A main effect was observed for the within factors comparison ($F = 79.868$, $p = 0.000$, $\eta^2 = 0.307$). The within factors comparison was also observed to have a medium to large effect as it explains nearly 31% of the variance (Newton & Rudestam, 1999). Therefore, the decision to reject the null hypothesis was made and post hoc analyses were run.

With no a priori comparisons planned, all possible pairwise comparisons of the 12 content areas were conducted with a Bonferroni adjustment for multiple comparisons. Output from the post hoc analysis for RQ2 is found in Appendix E. Table 5 identifies the abbreviations, means and standard deviations for the 12 content areas.
Table 5

Means of the 12 Content Areas

<table>
<thead>
<tr>
<th>Content Area</th>
<th>Abbreviation</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orthopedic Clinical Examination and Diagnosis</td>
<td>DI</td>
<td>4.41</td>
<td>0.51</td>
</tr>
<tr>
<td>Acute Care of Injuries and Illnesses</td>
<td>AC</td>
<td>4.36</td>
<td>0.60</td>
</tr>
<tr>
<td>Risk Management and Injury Prevention</td>
<td>RM</td>
<td>4.28</td>
<td>0.54</td>
</tr>
<tr>
<td>Conditioning and Rehabilitative Exercise</td>
<td>EX</td>
<td>4.17</td>
<td>0.71</td>
</tr>
<tr>
<td>Therapeutic Modalities</td>
<td>TM</td>
<td>4.12</td>
<td>0.64</td>
</tr>
<tr>
<td>Nutritional Aspects of Injuries and Illnesses</td>
<td>NU</td>
<td>3.91</td>
<td>0.62</td>
</tr>
<tr>
<td>Medical Conditions and Disabilities</td>
<td>MC</td>
<td>3.80</td>
<td>0.69</td>
</tr>
<tr>
<td>Psychosocial Intervention and Referral</td>
<td>PS</td>
<td>3.77</td>
<td>0.67</td>
</tr>
<tr>
<td>Health Care Administration</td>
<td>AD</td>
<td>3.75</td>
<td>0.69</td>
</tr>
<tr>
<td>Professional Development and Responsibility</td>
<td>PD</td>
<td>3.69</td>
<td>0.74</td>
</tr>
<tr>
<td>Pathology of Injuries and Illnesses</td>
<td>PA</td>
<td>3.67</td>
<td>0.64</td>
</tr>
<tr>
<td>Pharmacology</td>
<td>PH</td>
<td>3.32</td>
<td>0.78</td>
</tr>
</tbody>
</table>

Examination of the pairwise comparisons revealed several significant differences amongst the 12 content areas. With the exception of AC, the mean for the DI content area (M = 4.41, SD = 0.51) was significantly greater than the mean for all other content areas. The mean for AC was significantly greater than all content areas except DI and RM. The means of RM, EX and TM were not significantly different from each other, but they were
significantly greater than NU, MC, PS, AD, PD, PA. The means of NU, MC, PS, AD, PD, and PA were not significantly different from each other but they are each significantly greater than PH. The mean for the PH content area (M = 3.32, SD = 0.78) was significantly less than all of the content areas.

Research Question 3

RQ3: Is there an interaction between the independent variable (professional education) and the 12 educational content areas as dependent variables?

The null hypothesis for RQ3 is: There will be no interaction between the independent and dependent variables. More specifically, no significant interaction will be observed between the masters group and the baccalaureate group in each of the 12 content areas (H03: μm1 - μb1 = μm2 - μb2 ... = μm12 - μb12). A main effect was observed for RQ3 (F = 8.497, p = 0.024). However, a very small effect was observed (η² = 0.012). With such a small effect, 1.2% of variance explained, no post hoc analysis was performed.

Summary

This chapter reported the response rate to the Survey of Athletic Trainers’ Educational Preparation. The initial response rate was 26.8% but the response rate for those who completed the survey was 22.2%. The data screening process was explained and demographic information of the respondents was reported. Forty cases were removed during this process. This resulted in usable data from 182 respondents. This chapter also presented the results of three research questions. The results are summarized in the bulleted points below.
• A decision of fail to reject was made on the first null hypothesis. No significant difference in self-perceived educational adequacy was observed for the professional masters and professional baccalaureate groups.

• The second null hypothesis was rejected and a medium to large effect ($\eta = 0.307$) was observed. Post hoc analysis revealed several significant differences within the 12 content areas addressed in RQ2. Respondents reported self perception of better preparation in the DI content area and least perpetration in the PH content area.

• Null hypothesis number three was rejected. However, no post hoc testing was performed due to the observation of a very small effect ($\eta = 0.012$) for the interaction of program level and content area on self-perception of educational adequacy.
CHAPTER 5: SUMMARY AND CONCLUSIONS

Chapter five provides conclusions for this study. The chapter begins with a brief summary of the rationale and methods of the study. This is followed by a review of the three null hypotheses and an explanation of the conclusions drawn from the results of hypothesis testing. The final section of this chapter offers five recommendations for further research.

Summary of the Study

This study investigated the adequacy of professional athletic training education via three research questions. First: Do employed entry-level athletic training professionals who have graduated from a professional masters program perceive their academic preparation differently than employed entry-level athletic training professionals who graduated from a professional baccalaureate program? Second: Do employed entry-level athletic training professionals perceive their athletic training education the same in the 12 educational content areas designated in the 4th edition of the NATA Athletic Training Educational Competencies? Third: Is there an interaction between the independent variable (professional education) and the 12 educational content areas as dependent variables?

A population of athletic trainers who were certified from one to four years was identified to investigate these research questions. A web-based survey instrument was created and titled Survey of Athletic Trainers’ Educational Preparation. This survey used 60 carefully selected competencies, four to six competencies from each of the 12 content areas identified in the 4th edition of the NATA Athletic Training Educational Competencies. One thousand athletic trainers from the identified population were invited
to participate in the study. Data were screened at completion of the eight week data
collection period. The three null hypotheses created from the three research questions
were assessed with data from 182 respondents.

This study used a non-experimental design and a 2x12 between-within repeated
measures ANOVA analysis with an a priori α of 0.05. The between factors portion of this
analysis examined potential differences in self-perceived academic preparation of athletic
trainers from professional masters and baccalaureate athletic training education programs.
The within factors portion of the analysis addressed potential differences within the 12
content areas identified in the 4th edition of the NATA Athletic Training Educational
Competencies.

Summary of the Null Hypotheses Testing

The first null hypothesis was: There will be no significant difference in global
perceptions of academic preparedness between the professional masters (m) and
professional baccalaureate (b) groups. Upon examination of the data, no statistically
significant main effect was observed for professional program on self-perceived
academic preparedness. That is, the first null hypothesis was not rejected.

The second null hypothesis was: There will be no significant difference in the
perceptions of academic preparedness across all 12 educational content areas. After
examination of the data, the decision to reject the second null hypothesis was made. A
statistically significant main effect was observed for self-perceived preparation across the
12 content areas ($F = 79.868, p = 0.000, \eta^2 = 0.307$). A post hoc analysis was performed
to examine all possible pairwise comparisons within the 12 content areas. Results from this analysis are found in Appendix E.

The third null hypothesis was: There will be no interaction between the independent and dependent variables. More specifically, no significant interaction will be observed between the masters group and the baccalaureate group in each of the 12 content areas. A main effect was observed for this hypothesis and the decision to reject the null hypothesis was made. However, due to a very small effect, less than two percent of variance explained, no post hoc analysis was performed.

Conclusions of the Study

Graduate vs. Baccalaureate Professional Academic Preparation

A recent dissertation by Shinew (2011) identified no current literature that examined the current interest within the athletic training profession to transition the athletic training degree to the masters level only. This growing interest was discussed at the 2010 NATA Educators Conference in Washington D.C. This study was the first of its kind to examine self-perceptions of professional masters and baccalaureate prepared athletic trainers separately. The first research question addressed this gap in the literature by asking: Do entry-level athletic training professionals that have graduated from a professional masters program perceive their academic preparation differently than entry-level athletic training professionals who graduated from a professional baccalaureate program? Observation of data from this study led to the conclusion that there is no statistically significant difference between the perceptions of those who graduated from a professional athletic training education program at the masters level versus those at the baccalaureate level.
While the means for the masters and baccalaureate groups were not significantly different in the population, the masters prepared athletic training professionals in the sample perceived their professional education to be better than the baccalaureate group. Upon close observation of Figure 1, potential disparities between these two groups became more evident. The masters group in the sample perceived their professional education to be better than the baccalaureate group in 11 of the 12 content areas. While these differences were not statistically significant, they should be explored further.

Shinew (2011) reported two potential reasons for the growing interest to shift the athletic training profession solely to the professional masters certification route. The first reason for the shift might be due to the desire to make athletic training “recognized as a competent and innovative health care profession” (Shinew, 2011, p. 83). The second purpose for the shift relates to the type of student currently entering professional ATEPs, millennial students. These millennial students are thought to lack the maturity needed to gain entry into the profession at the baccalaureate level (Shinew, 2011). Data from this study may support the addition of a third reason to shift to the professional masters route. Since masters prepared athletic training professionals may possibly perceive their education to be better, maybe they are entering the profession with a greater knowledge and skill base. The results presented earlier in this study do not provide statistically significant evidence to fully support this claim. However, the results do provide evidence which warrants further research into the topic. This study examined self-perceptions of adequacy, but more concrete evidence on differences between the masters and baccalaureate groups may arise through a study of BOC certification examination pass rates.
The second research question examined if employed entry-level athletic training professionals perceived their athletic training education the same in the 12 educational content areas designated in the 4th edition of the NATA Educational Competencies? Means for all content areas were above 3.0. Based on the scale used, it was observed that respondents perceived their professional athletic training education program as adequate or better in preparing them to enter the profession as an athletic trainer in each of the 12 content areas.

A post hoc analysis afforded the opportunity for further examination of the data. This led to the conclusion that the 12 content areas were perceived differently amongst respondents. Means for the 12 content areas can be found in Table 5. Based on the means, the 12 content areas seemed to cluster into three different groups. The first group consists of the DI (M = 4.41, SD = 0.51), AC (M = 4.36, SD = 0.60), RM (M = 4.28, SD = 0.54), EX (M = 4.17, SD = 0.71), and TM (M = 4.12, SD = 0.64) content areas. Means for these content areas were significantly higher than the second group. Respondents felt better prepared for entry into the profession in these five content areas than the other seven. Within this group it is important to note that, with the exception of AC, the mean for the DI content area was significantly greater than all others. This indicates that respondents perceived their professional ATEP best prepared them in the Orthopedic Clinical Examination and Diagnosis content area.

Based on post hoc analysis findings, the second group of content areas included NU (M = 3.91, SD = 0.62), MC (M = 3.80, SD = 0.69), PS (M = 3.77, SD = 0.67), AD (M = 3.75, SD = 0.69), PD (M = 3.69, SD = 0.74), and PA (M = 3.67, SD = 0.64). Means
for these six content areas were not significantly different from each other. Means for content areas in this group seem to indicate that entry-level athletic trainers feel their professional ATEP at least adequately prepared them to enter the profession. However, respondents felt significantly less prepared in these content areas when compared to group one (DI, AC, RM, Ex, & TM). On the other hand, respondents felt significantly better prepared in this group of content areas than the PH content area.

The PH content area forms the final group. This content area is in its own group because the mean (M = 3.32, SD = 0.78) was significantly less than all other content areas. On average, the Pharmacology content area was self-perceived as adequate, but respondents did perceive their preparation lowest for this content area.

Observations on how these content areas have grouped could provide information useful for future curriculum design. The first group of content areas was perceived higher than the other two groups. This may be due to different educational strategies being employed within the curriculum. Is the content of the first group being delivered differently than that of the second and third groups? It is evident that the content of the first group is delivered through didactic and laboratory settings in most, if not all, professional athletic training programs. These content areas are also reinforced regularly through real world experiences in the clinical education component.

The same cannot be said for the content areas found in the two lower rated groups. One could not say that this content is taught through both lecture and lab components in most professional athletic training programs. Also, the general content of these areas may not be presented enough in the clinical setting to afford adequate experience to strengthen the content learned in the didactic setting. Creating more
educational experiences with the content in the lower two groups may afford students with a greater perception of their academic preparation.

Comparison of Content Areas to Previous Literature

While this study has a substantially different methodology and sample, its results seem to support conclusions drawn in similar studies (Donahue, 2009; Kugler, 1994; Massie, Strang, & Ward, 2009; Misasi, Davis, Morin, & Stockman, 1996; Stiller-Ostrowski & Ostrowski, 2009; Whitman, 2008). A perceived lack in preparation within the domain of Psychosocial Intervention and Referral or related skills was observed by Misasi et al. (1996), Stiller-Ostrowski and Ostrowski, (2009), and Kugler (1994). Due to differences in design, method, and sampling, a direct comparison of this study’s results cannot be made to those of Misasi et al. (1996), Stiller-Ostrowski and Ostrowski, (2009), and Kugler (1994). However, results from this study are similar in that the respondents self-perceived lower academic preparation in the same content area, Psychosocial Intervention and Referral. The Psychosocial Intervention and Referral content area was rated lower than seven other content areas in this study (see Table 5), but the mean score was 3.77. Even with the lower ranking, this means on average, respondents perceived their professional education to be at least adequate in the Psychosocial Intervention and Referral content area.

Donahue (2009) and Whitman (2008) also reported similar results to this study. Whitman (2008) surveyed graduates or those ready to graduate, in order to ascertain whether or not professional ATEPs were adequately preparing athletic training students for the Board of Certification Examination. Through an investigation of the 12 content areas, Whitman (2008) observed that respondents reported the content area of
Pharmacology to be “extremely inadequate” (p. 40). Similar to Whitman (2008), respondents of this study also self-perceived academic preparation in the content area of Pharmacology to be least. However, mean ratings of this study were above 3.0 indicating respondents still believed the preparation to be adequate.

Donahue (2009) surveyed 700 employed athletic trainers from the seven largest work settings: university/college, ATEP faculty, clinic, high school, hospital, high school/clinic, and professional sport. Among other variables, Donahue (2009) used the third edition of the NATA Athletic Training Educational Competencies and surveyed respondents on the level of academic preparation they received in the 12 content areas of the NATA Athletic Training Educational Competencies. Donahue (2009) reported highest ratings in the content areas of Assessment and Evaluation and Acute Care of Injuries and Illness. The results of this study mimic those of Donahue (2009), as the DI and AC content areas were also rated highest in this study.

In his study, Donahue (2009) also observed low ratings (below 3.0) for the content areas of Pharmacology, General Medical Conditions and Disabilities, Nutritional Aspects of Injury and Illness, Psychological Intervention and Referral, Health Care Administration, and Professional Development and Responsibilities. Donahue’s results again mirror the results of this study. All of the areas of low ratings reported by Donahue (2009) were also reported lower in this study. However, the ratings (slightly higher than 3.0) of the same content areas in this study are higher than those reported by Donahue (2009). An examination of the sampling differences between Donahue (2009) and this study may shed some light on these differences.
Respondents in this study were all educated via an accredited professional ATEP that utilized the 4th edition of the NATA Athletic Training Educational Competencies to guide their curricula. Donahue (2009) reported respondents in his study entered the profession through different educational tracts, which included the internship route. This difference in the education of the respondents could have led to the slightly different ratings. Starkey and Henderson (1995) specifically looked at this question when they compared BOC passing rates of candidates’ with their route to certification. Among other conclusions, they reported that the internship route resulted in lower passing rates on all sections of the BOC certification exam (Starkey & Henderson, 1995). A sample with internship route respondents would include individuals who were never formally educated in the content areas identified above. This may have led to the slightly lower ratings reported in the study conducted by Donahue (2009).

Recommendations for Future Study

1. The Survey of Athletic Trainers’ Educational Preparation was created to investigate the research questions of this study. The validity and reliability of this survey were assessed and reported. Construct validity was assessed through an exploratory factor analysis of the 60 items in part II of the survey. This analysis revealed that the items of the survey may have measured a global measure as opposed to 12 separate scales. Identifying the global measure that was potentially identified by the factor analysis provides an area for further investigation.

Also, the survey should be refined in an effort to improve construct validity. The athletic training educators who helped in competency selection for this study’s survey were asked to make selections based on criticality. Ranking all competencies based
on one factor may have resulted in the appearance of a global measure. Future panel experts should be asked to select those competencies that are most critical but also represent each educational content area the best. This may lead to the selection of competencies that represent the educational content areas better, rather than just importance to the profession. Also, more than five competencies should be selected in each content area. A pilot study and factor analysis can then be conducted to select the competencies that best measure each content area. This process should lead to better construct validity of the survey instrument.

2. This study was the first of its type to assess all 12 content areas identified in the 4<sup>th</sup> edition of the NATA Athletic Training Educational Competencies in one instrument and utilize the competencies to create scales designed to measure each content area. It was also the first to identify a specific population that encompassed only certified athletic trainers who were certified under the same educational content. This study has provided information on self-perceived academic preparation in relation to the 4th edition of the NATA Athletic Training Educational Competencies. However, the competencies are updated every five years. While this study was being conducted, the NATA published the 5<sup>th</sup> edition of the Athletic Training Educational Competencies. There are substantial changes to this version of the competencies and future investigations should be conducted to examine how professional ATEPs are adjusting to and preparing students in these new areas.

3. There is a growing interest in athletic training education to change policies for entry into the profession. Currently, one can enter into the profession through the completion of either a masters or baccalaureate professional ATEP. The current trend
is for some educators to think the profession should only allow access through an approved professional masters program. The researcher found no studies comparing the academic preparation of these two groups. This study was the first to explore this concept. Generalizations to the population cannot be made from this study because no statistically significant differences were observed between the Masters and Baccalaureate prepared athletic training professionals. However, means for 11 of the 12 content areas were higher in the masters group of this study’s sample. While not statistically significant, this difference seems to indicate that the sample of athletic trainers prepared via a professional masters ATEP felt better prepared than baccalaureate prepared athletic trainers.

Based on the lack of literature and results from this study’s sample, this topic warrants further research. This study examined self-perceptions of academic adequacy, but this brings up a question: Are more than just self-perceived differences in the educational preparation of graduates from professional masters and baccalaureate programs. During a previous time of potential athletic training educational change, Starkey and Henderson (1995) examined BOC pass rates of candidates from different routes to certification eligibility. Like the past, there is a growing interest to change the profession and only allow the professional masters program as a single rout to certification eligibility. Much like the past, BOC certification examination results should be studied to ascertain if masters and baccalaureate candidates are passing at the same rate.

4. Results from this study are similar to those of others who have performed global examinations the athletic training education or examinations of one specific content
This study, along with Whitman (2008) and Donahue (2009) identified the Pharmacology content area as a problem area. Whitman (2008) and Donahue (2009) observed that respondents identified their academic preparation in Pharmacology as inadequate or low. Respondents in this study reported adequate academic preparation; however the mean of this content area was significantly lower than all others. Specific content areas have previously been examined individually in the literature (Culpo, 2004; Misasi, Davis, Morin, & Stockman, 1996; Stiller-Ostrowski & Ostrowski, 2009). However, no study has specifically examined the Pharmacology content area. Further studies should investigate the Pharmacology content area to explore why self-perceptions of academic preparation are inadequate to low. These studies could examine who is teaching the content found in the educational competencies. Most importantly, are these individuals adequately prepared and qualified to teach the pharmacology content. Also, when and where in the curriculum is the pharmacology content being taught? Are the competencies being covered purely in the didactic setting or is there an intentional hands-on clinical component? Answers to these questions may provide evidence as to why this content is consistently rated low in the literature with regard to academic preparation.

5. As previously stated, there are specific content areas in which professional academic preparation is self-perceived to be either low or inadequate. However, the respondents of these studies are practicing athletic trainers, which brings up some interesting questions for further research. Are the athletic trainers who perceive these educational inadequacies filling in the gap? If the athletic trainers are correcting the inadequacies
upon entering the profession, where and how are they attaining the knowledge and skills they lacked when entering the profession?

Summary

Chapter five presented conclusions drawn from the results of this study and suggestions for further research. Athletic training professionals from baccalaureate and masters professional ATEPs who were educated under the 4th edition of the NATA Athletic Training Educational Competencies perceived the adequacy of their education the same. This was the first study to investigate these two groups separately. Generalizations to the population cannot be made because the difference in groups was not statistically significant. However, in this study’s sample, the professional masters group reported higher ratings than the baccalaureate group for 11 of the 12 educational content areas.

It was observed that respondents felt at least adequately prepared in each of the 12 content areas. Respondents perceived their professional education to be best in the content areas of Orthopedic Clinical Examination and Diagnosis and Acute Care of Injuries and Illnesses. Conversely, when compared to all other content areas, respondents reported significantly lower adequacy for the Pharmacology content area.

Five recommendations for further research are suggested. The first two recommendations charge future studies with improving the construct validity of the instrument and adapting the instrument to address the most recent content of the NATA Athletic Training Educational Competencies. Next, potential differences in the academic preparation of masters and baccalaureate prepared athletic trainers should continue to be assessed through a study of BOC certification examination pass rates. The fourth
recommendation addressed the need to closely examine content areas where academic preparation is perceived low or inadequate. Based on finding from this study and others, the content area of Pharmacology should be further investigated. Identifying reasons for the low ranking in this content area may provide professional athletic training programs with the actions needed to alter their program and better meet the needs of entry-level athletic trainers. Finally, the last recommendation for further research related to the potential gap in knowledge and skill. If athletic trainers perceive their professional education as inadequate in some way, are they correcting this inadequacy? If they are filling the gap, how are they acquiring the knowledge and/or skills?
REFERENCES


Board of Certification, Inc. Retrieved April 4, 2011, from


Board of Certification, Inc. (2004). *Role delineation study* (5th ed.). Omaha, NE: Board of Certification, Inc.


*Standards for the Accreditation of Entry-Level Athletic Training Education Programs.* Retrieved October 16, 2009, from  
http://caate.net/documents/Standards.6.30.08.pdf

http://proquest.umi.com.proxy.library.ohiou.edu/pqdweb?did=828405541&sid=1 &Fmt=2&clientId=3960&RQT=309&VName=PQD


http://www.nata.org/about_AT/whatisat.htm


APPENDIX A: SURVEY OF ATHLETIC TRAINERS’ EDUCATIONAL PREPARATION

The purpose of this investigation is to survey entry-level athletic training professionals to obtain your perceptions on the adequacy of your entry-level education. Simply put, now that you are certified and working in the profession, how adequate was your entry-level education?

This research investigation has been approved by Ohio University's Institutional Review Board and there are no foreseeable risks or benefits to completing this survey. However, the information you provide will benefit the athletic training profession and the education of its professionals.

There are two main sections to this survey. The first part of the survey consists of 6 questions related to demographic information. The second section will ask you reflect on your entry-level athletic training education, and then answer 60 questions. These questions are randomly divided into 6 pages and will address how well your entry-level education prepared you to enter the athletic training profession. Completing this survey will take approximately 20 minutes.

Your participation in this survey is completely voluntary. Please understand that your response to this survey will be kept anonymous and confidential.

If you choose to participate in this survey, please select the enter survey option below. If you would like to exit the survey then you may select the second option below. If you decide to stop participating in the study, there will be no penalty to you.

Thank you for your participation!

Enter Survey
Exit Survey

Please take a brief moment and reflect on your entry-level athletic training education. Now, if you would like, please feel free to use the space below to share general thoughts on the overall adequacy of the entry-level education you received.

If you do not want to share your thoughts then please continue to the question below.

After reflecting on your entry-level athletic training education, how would you rate the overall preparation/education you received prior to entering the athletic training profession?

Excellent
Good
Adequate
Poor
Inadequate
Part I

1. Sex
   - Male
   - Female

2. What educational level was your entry-level athletic training program?
   - Baccalaureate
   - Masters

3. What testing year did you pass the BOC Examination?
   - 2007-2008
   - 2008-2009
   - 2009-2010
   - Other: Please Specify ________________

4. How many months have you been a certified athletic trainer?

5. Highest level of education completed:
   - Entry-level bachelors
   - Entry-level masters
   - Post-professional masters in athletic training
   - Post-professional masters other than athletic training
   - Clinical doctorate
   - EdD
   - PhD
6. Which of the following best represents your current employment setting as an athletic trainer?

- College/university staff
- College/university faculty
- College/university graduate assistant
- Professional sports
- Secondary school
- Hospital/clinic
- Industrial/occupational
- Military
- Performing arts
- Physician extender
- Health safety
- I am not currently employed as an athletic trainer
- Other athletic training position (please specify): ____________________

Part II

For the second part of this survey, please reflect on your entry-level athletic training education again.

In this section, different scenarios and information will be presented to you. After carefully reading each item, please self-report how well your entry-level athletic training education program prepared you to enter the profession and handle that specific item. You will have the option to select whether your program did an excellent, good, adequate, poor, or inadequate job at preparing you for the associated item.

1. How well did your entry-level athletic training education program prepare you to explain the importance for all personnel to maintain current certification in CPR, AED, and first aid?
   Excellent        Good        Adequate        Poor        Inadequate

2. How well did your entry-level athletic training education program prepare you to identify and explain the components of a preparticipation examination based on appropriate authorities' rules, guidelines, and/or recommendations?
   Excellent        Good        Adequate        Poor        Inadequate

3. How well did your entry-level athletic training education program prepare you to explain the principles of effective heat loss and heat illness prevention programs?
   Excellent        Good        Adequate        Poor        Inadequate
4. How well did your entry-level athletic training education program prepare you to develop an appropriate fitness program to enhance flexibility, strength, power, muscular endurance, agility, cardiovascular endurance, and speed?

Excellent  Good  Adequate  Poor  Inadequate

5. How well did your entry-level athletic training education program prepare you to select, fabricate, and apply a variety of different preventative protective devices?

Excellent  Good  Adequate  Poor  Inadequate

6. How well did your entry-level athletic training education program prepare you to explain gross cellular adaptations in response to stress, injury, or disease?

Excellent  Good  Adequate  Poor  Inadequate

7. How well did your entry-level athletic training education program prepare you to explain the physiology of fluid homeostasis and normal and abnormal circulation?

Excellent  Good  Adequate  Poor  Inadequate

8. How well did your entry-level athletic training education program prepare you to identify the normal acute and chronic physiological and pathological responses of the human body to trauma, hypoxia, microbiologic agents, genetic derangements, nutritional deficiencies, chemicals, drugs, and aging?

Excellent  Good  Adequate  Poor  Inadequate

9. How well did your entry-level athletic training education program prepare you to describe the body's responses to physical exercise during common diseases, illnesses, and injury?

Excellent  Good  Adequate  Poor  Inadequate

10. How well did your entry-level athletic training education program prepare you to describe the principles and concepts of body movement?

Excellent  Good  Adequate  Poor  Inadequate

11. How well did your entry-level athletic training education program prepare you to describe common techniques and procedures for evaluating common injuries?

Excellent  Good  Adequate  Poor  Inadequate

12. How well did your entry-level athletic training education program prepare you to assess neurological status?

Excellent  Good  Adequate  Poor  Inadequate

13. How well did your entry-level athletic training education program prepare you to obtain a patient's medical history?

Excellent  Good  Adequate  Poor  Inadequate
14. How well did your entry-level athletic training education program prepare you to perform an inspection/observation of the clinical signs associated with common injuries?

- Excellent
- Good
- Adequate
- Poor
- Inadequate

15. How well did your entry-level athletic training education program prepare you to describe common techniques and procedures for evaluating common medical conditions and disabilities?

- Excellent
- Good
- Adequate
- Poor
- Inadequate

16. How well did your entry-level athletic training education program prepare you to describe and refer common cardiovascular and hematological medical conditions that occur from trauma, deformity, acquired disease, conduction disorder, and drug abuse?

- Excellent
- Good
- Adequate
- Poor
- Inadequate

17. How well did your entry-level athletic training education program prepare you to describe and refer common and/or contagious skin lesions that occur from trauma, infection, stress, drug reaction, and immune responses?

- Excellent
- Good
- Adequate
- Poor
- Inadequate

18. How well did your entry-level athletic training education program prepare you to describe and refer common and/or contagious skin lesions that occur from trauma, infection, stress, drug reaction, and immune responses?

- Excellent
- Good
- Adequate
- Poor
- Inadequate

19. How well did your entry-level athletic training education program prepare you to apply commonly used special tests and instruments as well as document the results for the assessment of vital signs, heart/lung/bowel sounds, pupil response, size and shape, ocular motion, body temperature, ear, nose, throat and teeth, and urinalysis?

- Excellent
- Good
- Adequate
- Poor
- Inadequate

20. How well did your entry-level athletic training education program prepare you to describe the different injuries and illnesses that require medical referral in an acute care scenario?

- Excellent
- Good
- Adequate
- Poor
- Inadequate

21. How well did your entry-level athletic training education program prepare you to determine the emergency care supplies and equipment necessary for circumstances in which you are the responsible first responder?

- Excellent
- Good
- Adequate
- Poor
- Inadequate

22. How well did your entry-level athletic training education program prepare you to identify the signs and symptoms of trauma to the cervical, thoracic and lumbar spinal regions, the spinal cord, and spinal nerve roots?

- Excellent
- Good
- Adequate
- Poor
- Inadequate
23. How well did your entry-level athletic training education program prepare you to implement a variety of emergency treatment strategies?

<table>
<thead>
<tr>
<th>Excellent</th>
<th>Good</th>
<th>Adequate</th>
<th>Poor</th>
<th>Inadequate</th>
</tr>
</thead>
</table>

24. How well did your entry-level athletic training education program prepare you to describe the effective management, positioning, and immobilization of a patient with a suspected spinal cord injury?

<table>
<thead>
<tr>
<th>Excellent</th>
<th>Good</th>
<th>Adequate</th>
<th>Poor</th>
<th>Inadequate</th>
</tr>
</thead>
</table>

25. How well did your entry-level athletic training education program prepare you to describe the physiological and pathological processes of trauma, wound healing and tissue repair and their implications on the selection and application of therapeutic modalities used in a treatment and/or rehabilitation program?

<table>
<thead>
<tr>
<th>Excellent</th>
<th>Good</th>
<th>Adequate</th>
<th>Poor</th>
<th>Inadequate</th>
</tr>
</thead>
</table>

26. How well did your entry-level athletic training education program prepare you to describe the electrophysics, physical properties, biophysics, patient preparation, modality setup, and specific physiological effects associated with common modalities?

<table>
<thead>
<tr>
<th>Excellent</th>
<th>Good</th>
<th>Adequate</th>
<th>Poor</th>
<th>Inadequate</th>
</tr>
</thead>
</table>

27. How well did your entry-level athletic training education program prepare you to assess patient indications, contraindications, and precautions applicable to the application of therapeutic modalities?

<table>
<thead>
<tr>
<th>Excellent</th>
<th>Good</th>
<th>Adequate</th>
<th>Poor</th>
<th>Inadequate</th>
</tr>
</thead>
</table>

28. How well did your entry-level athletic training education program prepare you to inspect therapeutic modalities and the treatment environment for potential safety hazards?

<table>
<thead>
<tr>
<th>Excellent</th>
<th>Good</th>
<th>Adequate</th>
<th>Poor</th>
<th>Inadequate</th>
</tr>
</thead>
</table>

29. How well did your entry-level athletic training education program prepare you to select and apply therapeutic modalities according to evidence based guidelines?

<table>
<thead>
<tr>
<th>Excellent</th>
<th>Good</th>
<th>Adequate</th>
<th>Poor</th>
<th>Inadequate</th>
</tr>
</thead>
</table>

30. How well did your entry-level athletic training education program prepare you to describe the mechanical principles applied to the design and use of therapeutic exercise equipment and techniques?

<table>
<thead>
<tr>
<th>Excellent</th>
<th>Good</th>
<th>Adequate</th>
<th>Poor</th>
<th>Inadequate</th>
</tr>
</thead>
</table>

31. How well did your entry-level athletic training education program prepare you to describe the physiological and pathological processes of trauma, wound healing and tissue repair and their implications on the development, progression and implementation of a therapeutic exercise program?

<table>
<thead>
<tr>
<th>Excellent</th>
<th>Good</th>
<th>Adequate</th>
<th>Poor</th>
<th>Inadequate</th>
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</thead>
</table>
32. How well did your entry-level athletic training education program prepare you to describe the indications, contraindications, theory, and principles for the incorporation and application of various contemporary therapeutic exercise equipment and technique?

Excellent Good Adequate Poor Inadequate

33. How well did your entry-level athletic training education program prepare you to define the basic components of activity-specific rehabilitation goals, functional progressions, and functional outcomes in a therapeutic exercise program?

Excellent Good Adequate Poor Inadequate

34. How well did your entry-level athletic training education program prepare you to assess a patient to determine specific therapeutic exercise indications, contraindications, and precautions?

Excellent Good Adequate Poor Inadequate

35. How well did your entry-level athletic training education program prepare you to identify the banned therapeutic drugs and nontherapeutic substances in order to properly advise patients?

Excellent Good Adequate Poor Inadequate

36. How well did your entry-level athletic training education program prepare you to identify the indications, contraindications, precautions, and adverse reactions for common prescription and nonprescription medications?

Excellent Good Adequate Poor Inadequate

37. How well did your entry-level athletic training education program prepare you to explain the concepts of pharmacokinetics and the suspected influence that exercise might have on these processes?

Excellent Good Adequate Poor Inadequate

38. How well did your entry-level athletic training education program prepare you to explain the general pharmacodynamic principles as they relate drug interactions and therapeutic effectiveness?

Excellent Good Adequate Poor Inadequate

39. How well did your entry-level athletic training education program prepare you to identify medications that might cause possible poisoning and describe how to activate and follow locally established poison control protocols?

Excellent Good Adequate Poor Inadequate

40. How well did your entry-level athletic training education program prepare you to identify components of a medical record, common medical record keeping techniques and strategies, and the strengths and weaknesses of each approach?

Excellent Good Adequate Poor Inadequate
41. How well did your entry-level athletic training education program prepare you to identify common human resource policy and federal legislation regarding employment?

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42. How well did your entry-level athletic training education program prepare you to develop policy and write procedures to guide the intended operation of athletic training services within a health care facility?

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43. How well did your entry-level athletic training education program prepare you to differentiate the roles and responsibilities of the athletic trainer from those of other medical and allied health personnel?

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44. How well did your entry-level athletic training education program prepare you to develop risk management plans, including facility design, for safe and efficient health care facilities?

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45. How well did your entry-level athletic training education program prepare you to explain the components of a budgeting process, including purchasing, requisition, bidding, and inventory?

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46. How well did your entry-level athletic training education program prepare you to differentiate the essential documents of national governing, certifying, and accrediting bodies related to the athletic training profession?

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47. How well did your entry-level athletic training education program prepare you to summarize the position statements regarding the practice of athletic training?

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48. How well did your entry-level athletic training education program prepare you to describe the current professional development requirements for continuing education of athletic trainers?

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<th>Inadequate</th>
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49. How well did your entry-level athletic training education program prepare you to identify the issues and concerns regarding the health care of patients? Examples include public relations and third party reimbursement.

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50. How well did your entry-level athletic training education program prepare you to interpret the current research in athletic training and other related medical and health areas and apply the results to your practice of athletic training?

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51. How well did your entry-level athletic training education program prepare you to explain the psychosocial requirements of various activities that relate to an injured individual's readiness to resume participation?

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52. How well did your entry-level athletic training education program prepare you to describe the psychosocial factors that affect persistent pain perception and identify multidisciplinary approaches to manage persistent pain?

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53. How well did your entry-level athletic training education program prepare you to describe the motivational techniques that you must use during rehabilitation and reconditioning?

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54. How well did your entry-level athletic training education program prepare you to explain the potential need for psychosocial intervention and referral when dealing with patients that have special considerations?

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55. How well did your entry-level athletic training education program prepare you to identify the symptoms and clinical signs of common eating disorders and the psychological and sociocultural factors associated with the disorders?

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56. How well did your entry-level athletic training education program prepare you to explain principles of weight control for safe weight loss and weight gain?

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57. How well did your entry-level athletic training education program prepare you to explain principles of nutrition as they relate to the dietary and nutritional needs of a patient?

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58. How well did your entry-level athletic training education program prepare you to identify and explain food label daily value recommendations and common sources of essential vitamins and minerals using current USDA Dietary Guidelines?

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59. How well did your entry-level athletic training education program prepare you to identify and explain consequences of improper fluid replacement?  
Excellent   Good        Adequate    Poor     Inadequate

60. How well did your entry-level athletic training education program prepare you to describe the principles and methods of body composition assessment to assess a patient's health status?  
Excellent   Good        Adequate    Poor     Inadequate
## APPENDIX B: COMPETENCIES SELECTED FOR USE IN THE INSTRUMENT

<table>
<thead>
<tr>
<th>Content Area</th>
<th>Selected Competencies</th>
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<td>Risk Management and Injury Prevention (RM)</td>
<td>RM-C4; RM-C7; RM-C8; RM-P2; RM-P5</td>
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<tr>
<td>Pathology of Injuries and Illnesses (PA)</td>
<td>PA-C2; PA-C3; PA-C4; PA-C6</td>
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<td>Orthopedic Clinical Examination and Diagnosis (DI)</td>
<td>DI-C5; DI-C6; DI-C9; DI-P1; DI-P2</td>
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<td>Acute Care of Injuries and Illnesses (AC)</td>
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<td>Therapeutic Modalities (TM)</td>
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<td>Psychosocial Intervention and Referral (PS)</td>
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<td>Nutritional Aspects of Injuries and Illnesses (NU)</td>
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<td>Health Care Administration (AD)</td>
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<td>Professional Development and Responsibility (PD)</td>
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Dear (Name of the Athletic Trainer),

I am a doctoral student at Ohio University, and I am completing my dissertation entitled “Athletic Trainers’ Perceptions on the Adequacy of their Entry-Level Education.” In one week you will receive an invitation to participate in a survey research study regarding your entry-level athletic training education. I am contacting you prior to the invitation in order to let you know how important your input is to this research.

As an entry-level professional you have recently graduated from an entry-level athletic training education program. In one week, you will be invited to share your perceptions on how well your entry-level education program prepared you to enter the Athletic Training profession. As a working professional, only you can share your valuable insight into the adequacy of your entry-level athletic training education. It is with your participation that we can advance the profession through enhancing the education of its professionals. I hope you are willing and excited to share your opinion when you receive the email invite next week.

I appreciate your time and would like to thank you in advance for your thoughtful consideration when invited to participate in this research study. Should you have any questions at this time, please feel free to contact me via email or phone.

Thank You,

Jeremy Dicus, MS, ATC
Dear (Name of the Athletic Trainer),

As an entry-level athletic training professional, you are being invited to participate in a survey research study entitled, “Athletic Trainers’ Perceptions on the Adequacy of their Entry-Level Education.” The purpose of this study is to survey entry-level athletic training professionals to gain their perceptions on how well their entry-level athletic training education program prepared them to enter the profession. This project is being undertaken as part of my doctoral study at Ohio University and it has been approved by the Institutional Review Board at Ohio University.

As an entry level professional, I would ask that you voluntarily complete the survey by clicking on the link below. While there are no risks or direct benefits to you, the survey will take about 20 minutes and your thoughtful answers to the questions will provide invaluable data for the athletic training profession.

There are two main sections to the survey. The first section includes 6 questions related to demographic information. The second section will ask you to report your perceptions on how well your entry-level athletic training education program prepared you in the twelve content areas identified in the Athletic Training Education Competencies.

Please understand that your response to this survey will be kept anonymous and confidential and your participation is completely voluntary. If you choose to participate, you have the right to withdrawal at any point. Clicking on the link below and completion of the survey will serve as evidence of your informed voluntary consent.

Should you have any questions or concerns, please contact Jeremy Dicus (jd245105@ohio.edu, (740) 277-8409). Also, should you wish to receive a summary of the study’s results following completion of the investigation, please email contact information to jd245105@ohio.edu.

If you have any questions regarding your rights as a research participant, please contact Jo Ellen Sherow, Director of Research Compliance, Ohio University, (740)593-0664.

I sincerely thank you for volunteering your time to assist in the advancement of the athletic training profession through participation in this research study.

By clicking on the link below, you are agreeing that:

- You have read this consent email and have been given the opportunity to ask questions and have them answered
- You are 18 years of age or older
Your participation in this research is completely voluntary
You may leave the study at any time. If you decide to stop participating in the study, there will be no penalty to you and you will not lose any benefits to which you are otherwise entitled.

Click here to give consent and take the survey.

Thank You,

Jeremy Dicus, MS, ATC
## APPENDIX E: PAIRWISE COMPARISONS OF THE TWELVE CONTENT AREAS

### Pairwise Comparisons

<table>
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<th>(I) ContArea</th>
<th>(J) ContArea</th>
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<th>Std. Error</th>
<th>Sig. a</th>
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<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>0.125</td>
<td>0.058</td>
<td>1.00</td>
<td>-0.075</td>
<td>0.325</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Based on estimated marginal means
*. The mean difference is significant at the .05 level.

a. Adjustment for multiple comparisons: Bonferroni.