Students’ Perception of a Theory-Practice Gap in Athletic Training Education

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ABSTRACT

Although highly researched in the fields of nursing and medicine, little research has been conducted on the presence of a theory-practice gap in athletic training education. Specifically, little is known about the students’ perception of differences between what is taught in the classroom versus what is used during clinical placements. The presence of a theory-practice gap could be problematic, creating confusion, forcing students to adapt what they are learning in the classroom from faculty Athletic Trainers to what they are using with their practicing Athletic Trainers in the clinical setting and vice versa.

The purpose of this study was to assess if there is a perceived difference between the skills that are taught in the classroom and the skills that are practiced in the clinical setting. In addition, this research aimed to understand what effect a theory-practice gap had on students and how students manage any differences they find. Lastly, this study aimed to understand whom students rely on for information, their classroom faculty or their preceptors.

An online survey was sent to all 340 Commission on Accreditation of Athletic Training Education (CAATE) undergraduate athletic training education programs in United States and was completed by 435 students in the clinical/professional phase of their program. Participants represented all ten National Athletic Trainers’ Association Districts.

Findings suggest that undergraduate athletic training students do perceive a difference between what they are taught in the classroom versus what they experience in the clinical setting. No significant difference was found based on student experience level in the
program. Although some students described negative emotional responses to the differences between the classroom and clinical settings, overall, athletic training students felt that the theory-practice gap had a positive impact on their learning, especially with their learning-over-time. Management strategies, especially asking for help, were similar for most respondents in this study. Lastly, athletic training students were found to rely more heavily on the clinical setting information as well as using their preceptors as a source of knowledge over the classroom and program faculty.

Unlike results from previous research on the theory-practice gap, most athletic training students in this study were able to see the connection between the classroom and the clinical setting. Still, 30% of the respondents felt the theory-practice gap had negative implications for their education. We as professional athletic trainers, both as faculty and preceptors need to do a better job explaining and helping our students understand the importance of seeing a variety of ways to practice athletic training. We need to help students see that both entities, content and experience, are vital to building a strong foundation as a practicing athletic trainer.
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CHAPTER 1

Introduction

Over the past ten to twenty years, the profession and educational processes of athletic training have evolved dramatically. Traditionally, like many healthcare professions, athletic trainers learned professional skills via an internship program, with most of their training taking place on the job. Learning needs were not a priority and much of the time in training was spent on basic and routine tasks (Delforge & Behnke, 1999). The internship route to becoming a certified athletic trainer was eliminated in 2004 and students must now graduate from an accredited athletic training education program (ATEP) in order to be eligible to sit for the Board of Certification exam (Delforge & Behnke, 1999). In the current education model, the teaching of student athletic trainers is a hybrid model, comprised of both didactic course work including the theories and hands-on skills of the profession in a safe environment, combined with practical experience out in clinical placements working with real patients under the direct supervision of preceptors. Unique to athletic training education is the connectedness and timing of these two educational components. In athletic training education, the coursework and practical learning opportunities occur concurrently throughout the program with students attending classes in the morning and going to clinical placements in the afternoon. Carr and Drummond (2002) stated that by having students learn in two different environments, the classroom and clinical settings, students are exposed to potential theory-practice or theory-application gaps. Vaughan (1987) concurred that if practice remains separate from
teaching, students will experience disparity between theory and practice (as cited by Hewison & Wildman, 1996).

A theory-practice gap in athletic training could also be attributed to the variety of certified athletic trainers that a student is learning from between classroom and clinical placements. Because of the rapid growth in accredited programs, many athletic trainers who have previously worked in the clinical setting have been slowly migrating to the educational setting. Certified athletic trainers have been taking on numerous educational roles ranging from program directors, to clinical education coordinators, adjunct faculty, split faculty/AT positions, and preceptors (formerly called clinical instructors). Over time, more and more athletic trainers have moved into the educational role full time, with little educational training, allowing the clinical aspects of their career to wane. Athletic training students thus may be getting their didactic information from faculty who have not practiced athletic training in quite some time. Students then go out to their clinical sites to work side by side with athletic trainers in the field. At times, there is little communication between faculty and practicing athletic trainers on the education content and the evidence behind what is taught and what is used clinically (Carr & Drummond, 2002).

According to Ferguson and Jinks (1994), the same issues have been noted in nursing education. “The physical (and often ideological) separation of nurse teachers and practitioners, with one group of nurses involved in caring and another in teaching nursing has frequently been highlighted as problematic” (p.688). Alexander (1983) refers to “the seclusion of tutors in the school and the practitioners in the ward. She describes them as
‘two opposing camps’ with the student struggling in the ‘no-man’s land’ in between” (p. 688). Consequently, students are exposed to a multitude of practitioners throughout their educational programs witnessing first-hand the variety of procedures used to accomplish similar goals. Students perceived this as problematic and confusing, adding to the discrepancy between what is taught (theory) and what is practiced during their clinical placements (McCaugherty, 1991).

In nursing research, many problems have been found when the presence of a theory-practice gap exists. Students are left with a wide variety of emotional responses and reactions to the differences between what is taught in the classroom and what is used in practice. Research reviewed by Cooke (1996) found students felt “anxiety, apprehensive, worried, and dubious” when working in nursing departments. Students identified many situations that caused stress including the initial experience or transition to a new clinical setting, interpersonal communication with caregivers, patients or tutors, technical skill usage and the attitudes and expectations of clinical nurses.

An additional problem created for students in nursing was their inability to make connections between the knowledge learned in the classroom and the skills used in practice. Hislop, Inglis, Cope, Stoddart, and McIntosh (1996) found that students had difficulty integrating the theoretical components with the practice of nursing during their placements. Some students reported that they did not see how components of the courses were relevant while learning and studying them, but in retrospect they understood their relevance. A similar finding is reported by Corlett (2000) who found junior students to be frustrated with so much time being spent on theory in the classroom while they preferred
to focus on learning practical nursing skills. Senior students on the other hand, could begin to understand how knowledge of the two parts came together in the whole of nursing. Sharif and Masoumi (2005) conducted a focus group study to investigate the clinical experience from the student nurses’ viewpoint. Students felt torn between the demands of their tutor and practicing nurses in real clinical situations. They were faced with different real clinical situations and were unable to generalize from what they learned in theory.

Many suggestions have been provided in recent decades to help eliminate the gap between theory and practice in nursing. Strategies include improving communication and collaboration between educators and practitioners, making changes to program curricula, changing the structure of faculty/practitioner position, incorporating evidence-based practice or a combination of all of these (e.g., Ferguson & Jinks, 1994; Corlett, 2000; Corlett et al., 2003; Baxter, 2007). While the profession of athletic training is quite young, many of the suggested means of minimizing the theory-practice gap by nursing researchers have been employed in the curriculum development for the education of athletic trainers. In athletic training education programs, didactic and clinical education occur concurrently. Ferguson and Jinks (1994) and Corlett (2000) both suggested changing the sequencing of the didactic and clinical components of the education program with the teaching of theory and its practice linked more closely. Although athletic training education employs both the classroom and clinical phases concurrently, little is known about how students feel about the connectedness of the classroom to their clinical placements. Many athletic training programs also use athletic trainers in a
multitude of positions like clinical educational coordinators, faculty/clinician split positions, and trained preceptors. Quinn (1995) describes the split position as a “coming together” of both positions for the benefit of all sides. An additional suggestion about faculty position changes is the use of a link teacher (Gerrish, 1992; Dale, 1994; Quinn, 1995; Corlett, 2000; Landers, 2000). Quinn (1995) suggested that the link teacher, now called Clinical Education Coordinators (CEC), needs to be seen as part of the education team and not just a visitor to the ward.

Similar to the profession of nursing, athletic trainers have also been encouraged to use evidence-based practice as a means to develop the profession and subsequently increase the autonomy of athletic training professional practice (Steves & Hootman, 2004). In theory, if evidence-based concepts are taught in the classroom and used in the clinical setting, the span between theory and practice should be decreased. In addition, Manspeaker, Van Lunen, Turocy, Pribesh, and Hankemeier (2011) suggest that an integration of didactic information and clinical application could be augmented by increasing the evidence-based practice expectations of both faculty and practitioners. Increasing evidence-based content in both the classroom and the clinical setting thus could aid in bridging the theory-practice gap. Although it has been found by Manspeaker et al. (2011) that athletic training students perceive a gap related to evidence-based practice, currently it is unknown if athletic training students perceive a gap between what is taught in the classroom and what is used in clinical placements. Additionally, it is unclear what impact a theory-practice gap may have on athletic training students.
**Problem Statement**

In athletic training education there is little research on the presence of a theory-practice gap. Little is known about athletic training students’ perception between what is taught in the classroom and what is practiced in the field. This disconnect could be problematic for students, creating confusion, forcing students to adapt what they are learning in the classroom from faculty to what they are using with assigned preceptors and vice versa. This gap could have a negative impact on their learning process. The fact that a theory-practice gap has been found in other allied health professions, e.g., nursing and medicine, suggests that investigating the possibility of its presence in athletic training is a worthwhile study.

**Purpose Statement**

The purpose of this study was to determine if athletic training students perceived a difference between what they are taught in the classroom by faculty athletic trainers versus what they see practiced in the clinical setting by preceptors. This study also aimed to examine what effect, if any, the presence of a theory-practice gap created for athletic training students. Lastly, this study examined what source of information athletic training students rely on for practical knowledge, information from the classroom versus clinical experience or information from faculty versus preceptors. To date, there is little research on the topic of theory-practice gap in athletic training education or on what potential impact the gap may have on student learning. This research furthered the evidence on theory-practice gaps in allied health professions, specifically in the field of athletic training.
Research Questions

1. To what extent do athletic training students perceive a difference between the information taught in the classroom and what is used in practice?

2. What effect does a theory-practice gap have on athletic training students? If students perceive a theory-practice gap, how do they manage any differences?

3. What source do athletic training students rely on for information? Classroom versus clinical information? Faculty versus preceptors as source of knowledge?

Currently, the majority of literature on the presence of a theory-practice gap, the problems it creates and the suggestions to minimize it are found in nursing and the field of medicine. Continuing the investigation of the above questions in the field of athletic training enhances and broadens the literature concerning theory-practice gap in additional healthcare professions.

Operational Definitions

Athletic Training – Athletic training is practiced by athletic trainers, health care professionals who collaborate with physicians to optimize activity and participation of patients and clients. Athletic training encompasses the prevention, diagnosis, and intervention of emergency, acute, and chronic medical conditions involving impairment, functional limitations, and disabilities. Students who want to become certified athletic trainers must earn a degree from an accredited athletic training curriculum. Accredited programs include formal instruction in areas such as injury/illness prevention, first aid and emergency care, assessment of injury/illness, human anatomy and physiology,
therapeutic modalities, and nutrition. Classroom learning is enhanced through clinical education experiences. ([www.nata.org](http://www.nata.org))

**Preceptor** - An appropriately credentialed professional identified and trained by the program administration to provide instruction and evaluation of the Athletic Training Educational Competencies and/or Clinical Proficiencies. The preceptor may not be a current student within the Athletic Training Education Program. Preceptors provide supervision of athletic training students during their clinical experience. Formally, preceptors were called Approved Clinical Instructors or Clinical Instructors. ([www.nata.org/caate-clinical-education-terminology](http://www.nata.org/caate-clinical-education-terminology))

Synonym: In previous nursing literature, similar terms are practitioner, ward teacher

**Clinical Education Coordinator** - The individual a program may designate as having the primary responsibilities for the coordination of the clinical experience activities associated with the Athletic Training Education Program. The clinical coordinator position is currently recommended, but not required by the Standards. ([www.nata.org/caate-clinical-education-terminology](http://www.nata.org/caate-clinical-education-terminology))

Synonym: In previous nursing literature, termed the link teacher

**Split Appointment** – An Athletic Trainer whose contract is divided between teaching courses for an accredited athletic training education program and covering in an athletic training facility with a sport team assignment, thus serving as faculty and as a practitioner.
Clinical Education – The application of knowledge and skills, learned in classroom and laboratory settings, to actual practice on patients under the supervision of a preceptor. A segment of the clinical education experience must be directed towards a patient population having general medical ailments. (www.nata.org/caate-clinical-education-terminology)

Clinical Experience - Clinical education experiences for the Athletic Training Students that involve patient care and the application of athletic training skills under the supervision of a qualified preceptor. (www.nata.org/caate-clinical-education-terminology)

Theory - The principles and knowledge needed to understand the why of practice (Corlett, 2000). For this study, theory is defined as the principles that describe, explain, and guide practice.

Theory-practice gap - The discrepancy between what students are taught in the classroom setting (theory) and what they experience during clinical placements (practice) (Ferguson & Jinks, 1994; Corlett, 2000; Landers, 2000; Baxter, 2006).

CCARE Model- A model of clinical supervision to help bridge the theory-practice gap. It includes Communication and Collaboration between the classroom teacher, preceptors, student and patient. It also includes Application, Reflection, and Evaluation of a theory being used on a patient to bridge the theory-practice gap (Baxter, 2007).
PALPATE – An approach for students to use reflective practices to analyze how a theory worked in practice. Commonly this approach is used as a journaling assignment starting with a Patient situation, Application of theory, Level of difficulty applying the theory, Patient outcomes/feedback, Analysis of positive and negative characteristics of the theory, Theory appropriateness, and Evaluation of the ability to apply this theory into practice (Baxter, 2007).
CHAPTER 2

REVIEW OF THE LITERATURE

The growth and development of the allied health profession athletic training over the past 60+ years has been dramatic. Athletic training has mimicked the evolution of other healthcare professions including medicine, physical therapy, and nursing. The profession of nursing also provides the most substantial evidence of a theory-practice gap as it relates to the education of nursing professionals. The following chapter will guide the reader through the history and evolution of the profession of athletic training and present the definition of the theory-practice gap as found in nursing literature. Further, the reason the theory-practice gap exists and the problems that a theory-practice gap creates for students are presented. Lastly, the relationship between theory-practice gap and the education of athletic training students is provided.

History of Athletic Training

The profession of athletic training has evolved rapidly from its inception in 1950 with the formation of the National Athletic Trainers’ Association (NATA) through the early 2000s. With the goal of enhancing the professionalization of athletic training, the NATA Professional Education Committee started to investigate curricular models in the mid-1950s (Delforge & Behnke, 1999). Delforge and Behnke have compiled the most complete history of athletic training. The following summary is from their writings. In 1959 the NATA committee’s recommendations for an educational program were approved. In addition to a few specific athletic training courses, the main courses in the
curricular model were derived from physical therapy programs, physical education/health programs, and also included secondary-education teaching certifications. Over the next 10 years, two large events occurred to greatly enhance the professionalization of athletic training: NATA-approved education programs and the implementation of a certification examination. In 1969 the first undergraduate athletic training education programs were officially recognized by the NATA including: (a) Mankato State University, (b) Indiana State University, (c) Lamar University, and (d) the University of New Mexico. In 1970 the first certification examination was given to candidates who graduated from a NATA-approved program, graduated from a physical therapy program, completed an apprenticeship program, or completed a special consideration route, i.e., grandfathered in with experience.

According to Delforge and Behnke (1999), during the rest of the 1970s, athletic training education programs (ATEP) grew quickly across the country. Starting with only four programs in 1969, by 1982, 62 programs had been developed across 33 states. As the number of education programs grew, so did the knowledge specialization of the profession. By the mid-1970s, the athletic training curriculum was revised to eliminate other professional knowledge bases and eliminated the teaching credential requirement. These changes led to a more narrowed core of athletic training courses which in turn contributed to attaining athletic training competencies. Also during this time, along with developing a skill competency checklist, the NATA Professional Education Committee formalized a list of behavioral objectives that identified desired learning outcomes for students (Delforge & Behnke, 1999). These behavior objectives were based on 11
required courses such as Anatomy & Physiology, Psychology, Nutrition, First-Aid, Physiology of Exercise, and Basic and Advanced Athletic Training (Weidner & Henning, 2002). These authors add that in addition to the course work, a set amount of clock hours of laboratory or practical experience was required. These requirements further defined the unique body of knowledge for certified athletic trainers.

In the 1980s, the changes in athletic training education focused on making the athletic training body of knowledge an academic major in universities and colleges. With the goal of July 1, 1986, later extended to July 1, 1990, the NATA Board of Directors called for a resolution for all NATA-approved undergraduate athletic training programs to offer a major field of study in athletic training instead of a concentration or emphasis (Delforge & Behnke, 1999). In 1983, the NATA Professional Education Committee developed a publication entitled Guidelines for Development and Implementation of NATA Approved Undergraduate Athletic Training Education Programs, guiding institutions in the development process. Two main changes featured in these Guidelines were the change from required courses to required specific subject matter; and secondly, it featured the Competencies in Athletic Training, identified by the first role delineation study of 1982, replacing the behavioral objectives (Delforge & Behnke, 1999; Weidner & Henning, 2003).

Delforge and Behnke report that in the late 1980s, the NATA Board of Directors authorized the Professional Education Committee to seek accreditation through the American Medical Association (AMA) Committee on Allied Health Education and Accreditation (CAHEA). According to the NATA (1990), this decision was based on the
perceived benefits of standardized education program requirements and external peer review by a highly regarded, specialized accreditation agency. As a result, in June of 1990, the American Medical Association formally recognized athletic training as an allied health profession (NATA, 1990). Following this large event in athletic training history, the development of a review committee formed with members from the American Academy of Family Physicians, the American Academy of Pediatrics, the American Orthopaedic Society for Sports Medicine, all joining the AMA and NATA to create the Joint Review Committee on Educational Programs in Athletic Training (JRC-AT) (Delforge & Behnke, 1999). Changing the format of the Guidelines, and using the Competencies as a companion, the JRC-AT developed the Essentials and Guidelines for an Accredited Educational Program for the Athletic Trainer in 1991 (Delforge & Behnke, 1999). The Essentials later became known as the Standards under the new free-standing accrediting body of the Commission on Accreditation of Allied Health Education Programs (CAAHEP) in 1994. In June of 2006, the JRC-AT became independent from CAAHEP and changed its name to the Commission on Accreditation of Athletic Training Education (CAATE). Today, CAATE is responsible for accrediting over 360 professional entry-level athletic training education programs (www.caate.net).

In addition to accreditation of programs occurring, in 1996 the NATA Board of Directors adopted 18 recommendations submitted by the NATA Education Task Force (appointed in 1994) (Delforge & Behnke, 1999). Of the recommendations, the most significant recommendation was for the NATA and the Board of Certification (BOC) to work together to “institute a requirement, effective in 2004, that in order to be eligible for
the certification examination, all candidates must possess a baccalaureate degree and have successfully completed a CAAHEP-accredited entry-level athletic training education program” (as cited by Delforge & Behnke, 1999, p.60). Because the physical therapy and special consideration routes to certification were eliminated in the early 1980s, this recommendation in turn started the process of eliminating the internship route to certification. In doing so, the educational process of athletic training students became more standardized and consistent with professional preparation in other allied health disciplines (Delforge & Behnke, 1999).

A second recommendation submitted by the NATA Education Task Force was to address the responsibilities and preparation of the athletic training clinical instructor/preceptor (Weidner & Jenning, 2002). In 2001, the Commission on Accreditation of Allied Health Education Programs formally adopted the Approved Clinical Instructor (ACI) designation in the revised Standards and Guidelines (as cited by Weidner & Henning, 2002, p. S-225) and implemented training standards for each clinical instructor/preceptor. Approved Clinical Instructors/preceptors were then trained on how to effectively teach and evaluate the athletic training clinical proficiencies.

In conjunction with the elimination of the internship route to certification and training preceptors to be more effective teachers, the NATA Education Council created a Competencies Committee in 1997 to review and expand the current NATA competencies in athletic training (Weidner & Henning, 2002). These authors report that the Competencies Committee, in the 3rd edition of the Competencies, expanded the scope of content in athletic training from 6 domains to 12 domains. Today, the 5th edition of the
Athletic Training Educational Competencies includes 8 content areas: Evidence-Based Practice, Prevention and Health Promotion, Clinical Examination and Diagnosis, Acute Care of Injury and Illness, Therapeutic Interventions, Psychosocial Strategies and Referral, Healthcare Administration, and Professional Development and Responsibility (NATA, 2011).

The NATA (2011) states the following:

The 5th edition of the Athletic Training Education Competencies (Competencies) provides educational program personnel and others with the knowledge, skills, and clinical abilities to be mastered by students enrolled in professional athletic training education programs. Mastery of these Competencies provides the entry–level athletic trainer with the capacity to provide athletic training services to clients and patients of varying ages, lifestyles, and needs. (p. 3)

In changing the educational process so student achievement is measured on the demonstration of clinical proficiencies, the acquisition of clinical hours were eliminated as the measure of a student’s clinical progression and eligibility to sit for the certification examination (Weidner & Henning, 2002).

In the current education model, the teaching of student athletic trainers is a hybrid, comprised of both core athletic training didactic course work including the theories and hands-on skills of the profession in a safe environment, combined with practical experience out in clinical placements working with real-live patients under the direct supervision of preceptors. The coursework and practical learning opportunities occur concurrently throughout the program; thus little time is spent in observation allowing for more integration of theoretical and practical knowledge with actual patients. During the clinical education component of the program, athletic training skills are taught and assessed starting from general technical skills progressing to clinical competence over
time in a multitude of athletic training work environments. According to Laurent and Weidner (2003), entry-level certified athletic trainers perceive that approximately 53% of their entry-level professional development came from clinical education. Given the importance placed on both the classroom and clinical education components of athletic training education, the relationship and connection between what is being taught in the classroom and what is being used in practice is of utmost importance.

**The Theory-Practice Gap**

Among healthcare professions, nursing research has provided the most thorough description of the theory-practice gap which can be applied to the profession of athletic training. In general terms, nursing literature defines the theory-practice gap as the discrepancy between what students are taught in the classroom setting (theory) and what they experience during clinical placements (practice) (Ferguson & Jinks, 1994; Corlett, 2000; Landers, 2000; Baxter, 2006). Several authors found that theory and practice cannot exist separately, they are dependent upon the other (Corlett, 2000; McCaugherty, 1991). McCaugherty (1991) stated that theory and practice have a complementary role, “Theory without practice is sterile, practice without theory is blind” (p. 1061). Corlett (2000) defined theory as the principles and knowledge needed to understand the why of practice. In her study comparing the perceptions of nurse teachers, nursing students and preceptors, teachers perceived theory to be taught in both the classroom and clinical areas while students firmly placed theory in the classroom.
For the purpose of this study, theory is defined as the principles that describe, explain, and guide practice. Further, the theory-practice gap in this study is defined as the lack of congruence between the theory that is taught in the classroom and the practice that students see and engage in during their clinical placements.

**Reasons for the Theory-Practice Gap in Nursing**

Analysis of the underpinnings of the theory-practice gap leads to a plethora of interrelated topics that contribute to its existence in nursing. These factors include nursing education methods, knowledge separation between teachers and practitioners, and nursing research development, and utilization. Lastly, changes in healthcare management will be presented as a reason for the theory-practice gap in nursing.

**Education.** Traditionally, like nursing education, athletic trainers learned professional skills via an internship program, with most of their training taking place on the job. Learning needs were not a priority and much of the time in training was spent on basic and routine tasks (Delforge, & Behnke, 1999). According to Ferguson & Jinks (1994), the same issues have been noted in nursing education. “The physical (and often ideological) separation of nurse teachers and practitioners, with one group of nurses involved in caring and another in teaching nursing has frequently been highlighted as problematic” (p. 688). Alexander (1983) referred to the seclusion of tutors in the school and the practitioners in the ward. She describes them as “two opposing camps” with the student struggling in the “no-man’s land” in between.
Hewison and Wildman’s (1996) review of literature on the history of the theory-practice gap in nursing noted that many educational reasons for the gap exist. First, Jolley (1987) found that teachers in the classroom are generating knowledge which is unrelated to practice. McCaugherty (1991) agreed, stating that educators are using texts and materials that only can speak to the ideal of nursing practice and can never bring in the realities of the variety of patients a student will encounter. Students are thus led to feel that a theory-practice gap exists because the representation of nursing given in class does not completely match nursing practice. Nursing theory can only give an average or ideal view and can never bring in the uniqueness of true individual patients’ needs.

Historically, Bertrand Russell described this phenomenon in 1967 in his writing of *The Problems with Philosophy* (as cited by McCaugherty, 1991). He referred to “knowledge by description” versus “knowledge by acquaintance” (p. 1056), the first providing us information about things that are beyond our own personal experiences, but falling short of the latter, i.e., knowledge gathered by direct experience. Vaughan (1987) concurred that if practice remains separate from teaching, then students will experience disparity between theory and practice (as cited by Hewison & Wildman, 1996).

Corlett (2000) also added to the educational underpinnings of the theory–practice gap stating that the gap in nursing exists because teachers emphasize performing skills in an ideal way, while practitioners are more concerned with getting the work completed realistically. In her study, all interviewees felt that a theory-practice gap did exist, with students feeling the gap was larger than what teachers perceived it to be. Ferguson and Jinks (1994) also found discrepancies between the nurse teachers’ educational goals and
that of the nurse practitioner. While curricula strive to prepare knowledgeable, questioning practitioners, the hidden curriculum of the ward aims to produce a compliant worker, allowing for a smooth running institution. Other researchers state that while schools focus on developing long-term self-directed learners, practitioners focus on preparing safe and competent nurses (Ferguson & Jinks, 1994).

**Knowledge separation.** The theory-practice gap can also be attributed to the disparity between what knowledge is considered most valuable to the teacher versus what is most valuable to the practitioner. Miller (1989) believed that different types of knowledge are valued between educators and practitioners. She stated that “nurse teachers value ‘know that’ theoretical knowledge (concepts, descriptions, predictions of nursing care theory) versus ‘know how’ practice knowledge which practitioners value” (as cited by Ferguson & Jinks, 1994, p. 689). Reed and Procter (1993) argued that unequal weighting of value placed on intellectual knowledge and physical skills in the general education system causes the theory-practice gap. Nurses felt that although the intellectual (theoretical) knowledge has more status, it is of limited use in the reality of their practice, thus creating a gap (as cited by Hewison & Wildman, 1996).

Dale (1994) postulated that there is not a theory-practice gap, but rather a theory-theory gap. She stated that because practicing nurses undertake purposeful activity and are able to give an account and justify their practice, demonstrating accountability, they are enacting theory-based practice. Dale continued by saying that if nursing is based on theory then the issue is a theory-theory gap, a gap between the theory taught in the classroom and the theory upon which practice is based. Since two different theoretical
perspectives are being used by nurse teachers and practitioners, a theory-theory gap exists, not a theory-practice gap, but both theoretical perspectives are relevant to nursing (Dale, 1994).

Dale (1994) also described how nursing is missing the third link in knowledge types, i.e., experiential knowledge. Without this type of knowledge, the theory-practice gap is magnified. She describes three types of nursing knowledge: (a) propositional knowledge or factual theory, (b) practice knowledge which is taught in the classroom, and (c) experiential knowledge which is gained when students analyze propositional and practice knowledge through their experiences. The missing component in most nursing education programs is the ability to gain experiential knowledge. This adds to the theory-practice gap because educational programs are not facilitating experiential knowledge growth. Dale continued by stating we can bridge the theory-practice gap by having practitioners increase their factual knowledge, having educators increase their practice knowledge and allowing students to gain experiential knowledge through meaningful interactions and events.

**Research.** Starting in the early 1990s, nurses were being charged with the goal of demonstrating effectiveness through the use of research in their practice. Using research was also seen as a fundamental means of achieving professionalism and autonomous nursing practice (Upton, 1999). In concept, evidence-based practice should reduce the gap between theory and practice by encouraging clinical practitioners to focus the critical reading and analysis of literature on providing effective healthcare. Evidence-based practice originated from the belief that health professionals should no longer base
practice on tradition and belief, but on sound information grounded in research findings and scientific development (Department of Health, 1995).

Even with new evidence being produced within the nursing profession, many factors related to research add to the theory-practice gap. Issues of how research is conducted in nursing, who conducts the research and the time lag between the development and its introduction into practice, all correlate to the theory-practice gap. Casey (1991) stated that the generation of nursing theory is mainly by educators and not practitioners which added to the presence of a theory practice gap. Practitioners felt alienated when the nursing theory that was generated was then imposed upon their practice. Upton argued that most of the older practicing nurses are not trained in reading research literature nor do they take the time to read the current findings. Rolfe (1996) also stated that nurses will not implement the current research because the majority of research is unsuited to current nursing practice since it is written from a theoretical framework (as cited by Upton, 1999). Upton suggested that research needs to be conducted through collaboration between the nurse educators and the nurse practitioners to better bridge the theory-practice gap.

Rafferty, Allock and Lathlean (1996) discussed the opposite, having research developed on the practical side of nursing. These authors argued that informal theory is generated from reflecting on actions that occur in a practical environment. The theory is then modified based on reflexive application back into practice. Rafferty et al. believed that the development of informal theory would then be the means of diminishing the
theory-practice gap. The authors advocated that the research relationship should be reciprocal with practice informing theory to the same degree that theory tests practice.

Similarly, Tolley (1995) continued by looking at who should be conducting nursing research by analyzing the concept of practical theory development. She stated that practical theory is “theory which is developed from practice for practice” (p. 184). It is theory that provides action for the actual healthcare of the patients being treated in the clinic. Practical theory is based on the real world where the problem is identified and needs to be resolved. Practical theory is produced by those who are actually working with the healthcare of patients. Thus, if the practical theory being produced by practitioners is taught in the classroom, instead of the ideal image of nursing that is currently taught, the theory-practice gap should be reduced. According to Tolley, practitioners conducting research should be the means to bridging the theory-practice gap in nursing education.

Lastly, Dale (1994) stated that research creates a theory-practice gap due to timing. She described a time lag occurring between the development of theory and its validation and integration into practice by practitioners. In order to validate a theory, multiple studies looking at the same theory are needed and practitioners need time to integrate it into their practice. Infusing these new theories across a profession also takes time, thus the time lag is what produces the gap between what is taught in the classroom and what is used in practice. However, Dale does not see the time lag as negative, but as a positive feature, that is, “more of a dynamic growing theory base rather than lack of use of theory in practice” (p. 523).
Management. Lastly, Hewison and Wildman (1996) discussed how the theory-practice gap is made even more complex because of differing approaches to the delivery of healthcare in nursing. They argued the separation of organizations delivering healthcare (managerial principles) from those providing education (humanism, holism) for nurses. The movement of nurse education into a higher education environment instead of in hospital wards is placing further distance between the education and practice of nursing according to these authors. Nurse educators are teaching students to treat the individual patients’ needs while healthcare organizations/managers are also valuing the bottom line, placing the nurse practitioner in the middle. In turn, students who are completing clinical placements with these practitioners witness first-hand the perpetuation of the theory-practice gap. Cook (1991) also alluded to the institutional demands of the nurse practitioner causing a hidden curriculum within the clinical area. Cook stated that the theory taught within the school purports to benefit the patient, but the underlying theory many nurses practice in fact, serves to protect nurses from stress and to meet the needs of the institution, not the patient (Cook, 1991).

Although most literature described the theory-practice gap in nursing as problematic, Rafferty et al. (1996) concluded that the gap can never be completely removed, suggesting that theory and practice are always dynamic in nature. If change is to occur in clinical practice, then Rafferty et al., suggested the tension is necessary, proposing that “the disjunction between theory and practice is necessary for learning to take place at all, lose the tension and the impetus to learn is lost” (p. 689).
Problems the Theory-Practice Gap Creates for Students

When analyzing the theory-practice gap, it is imperative to notice what is in the middle, i.e., the student trying to learn. Research has been conducted to explore if students perceive a theory-practice gap and the implications that gap may create in the education of medical students, physiotherapy students and nursing students over the past few decades. Students exposed to this gap have a variety of emotions and reactions about its presence and how to deal with it.

**Students’ reactions.** Elkan and Robinson’s (1993) study of the theory-practice gap in nursing found that students felt left in the middle, feeling awkward and ill at ease during some of their early ward placements. Students were led to believe by their nurse teachers that their learning was to be self-directed, i.e., they would let the practitioners know what their learning needs were and then service practitioners would assist them in attaining their learning goals. Service practitioners had a very different view of learning, with very little understanding of self-directed learning. Their main concerns were for patient safety and knowing if a student was allowed to use particular skills and whether they had completed that task prior to coming to clinical rotations. Students seemed to accept the service practitioners’ definition of themselves as being ill-equipped to perform tasks safely and competently (Elkan & Robinson, 1993).

Research reviewed by Cooke (1996) found similar emotions from students in nursing programs. She indicated that students felt “anxiety,” “apprehensive,” “worried,” and “dubious” when working in nursing departments. Students identified many situations that cause stress including the initial experience or transition to a new clinical setting,
interpersonal communication with caretakers, patients or tutors, technical skill usage and the attitudes and expectations of clinical nurses. Cooke’s review also found that technical skills were the most frequently mentioned challenge/difficult situation. Students feared being asked to complete a skill they were not capable of completing and feared being asked to perform a challenging skill. As students completed their clinical placements, some fears were eliminated while new challenges were created in regards to types of patients and interpersonal communication.

Similar research has been conducted on the education of medical students and their perception of the theory-practice gap. Both Alexander and Haldane (1979) and Radcliffe and Lester (2003) found that students felt like the transition from the classroom to the clinical setting was a cause of stress. Students described feeling like they had insufficient knowledge or skills to aid in patient care which created a stressful learning environment (Radcliffe & Lester, 2003). Prince, Van de Wiel, Scherbier, Van Der Vleuten, and Boshuizen (2000) conducted a focus group study showing that changes perceived by students at the beginning of the clinical rotations include negative experiences associated with professional socialization, difficulty in applying their knowledge and skills to real patient problems and the need to adopt different learning strategies. A follow-up study by Prince, Boshuizen, Van Der Vleuten, and Scherpier (2005) surveyed medical students on the transition from pre-clinical to clinical training and the problems it causes. Subjects were from the Maastricht Medical School in the Netherlands where the first four years of schooling are theory-based followed by two years of clinical clerkship. According to Prince et al. (2005) 67 percent of the students surveyed indicated they were nervous
starting clinical clerkship and a few considered leaving. Many reported having difficulty adjusting to the daily routine. Students also felt the workload was heavy, hours were long and the work was tiring. The majority of students did perceive a gap in their knowledge and did not feel prepared. More than half agreed that clinical practice called for a different type of knowledge than required in pre-training (Prince et al., 2005).

**Students’ ability to make connections between theory and practice.** Hislop, Cope, Stoddart and McIntosh (1996) studied the relationship between college courses and students’ experiences in nursing placements. More than half of the students interviewed felt there was difficulty relating their college courses to practice except in the classroom context of specific tasks like practical skills or medical procedures. This research (1996) also found that students had difficulty integrating the theoretical components with the practice of nursing during their placements. Some students reported that they did not see how components of the courses were relevant while learning and studying them, but in retrospect they understood their relevance. Students also noted that the relationship between their college courses and placements really was not about the college courses illuminating their practice, but the opposite, where the practice helped them grasp the theory from the course work. A similar finding is reported by Corlett (2000) who found junior students to be frustrated with so much time being spent on theory in the classroom while they preferred to focus on learning practical nursing skills. Senior students on the other hand, could begin to understand how knowledge of the two parts came together in the whole of nursing. Although the students found the differences between theory and practice frustrating, Corlett reported that students gave more credence to what they saw
and learned during clinical placements. When classroom information differed from clinical experiences, students perceived the teacher as being outdated and of questionable credibility. More recently, Sharif and Masoumi (2005) conducted a focus group study to investigate the clinical experience from the student nurses’ viewpoint. Four main themes emerged including “initial clinical anxiety,” “theory-practice gap,” “clinical supervision,” and “professional role” (Results section, para. 2). Concerning the theory-practice gap, all students mentioned a lack of integration of theory into clinical practice. Students felt torn between the demands of their tutor and practicing nurses in real clinical situations. They were faced with different real clinical situations and were unable to generalize from what they learned in theory. Lastly, students felt that the skills they were using in the clinical setting were not “professional” level. They were allowed to do only basic care skills and thus did not feel like the professional image discussed by faculty was the same as on the ward (Sharif & Masoumi, 2005).

Lastly in nursing literature, McCaugherty (1991) provided a very interesting viewpoint on why students perceive a theory-practice gap in nursing education. First, he stated that the nursing characteristics that are presented in the classroom and via textbooks, paint a very different picture of nursing when compared to what students will experience in the real nursing practice during placements. Textbooks and lectures typically can only talk about the general or average patient that a practitioner could be presented with and thus this imperfect representation appears as a gap when a student experiences the variety and individuality of actual patient care. Just because a student feels confident in the principles of nursing, does not guarantee that the application to an
actual patient with varying needs will occur. Thus because students cannot make the connection, they perceive a gap between what they are being taught and what they see practiced (McCaugherty, 1991). Second, medical professions are not exact sciences, with more than one method to meet an objective. Most medical professionals have also learned skills and practical knowledge from a variety of practitioners throughout their education and careers and have made adaptations to those skills as they practice over time. Consequently, students are exposed to a multitude of practitioners throughout their educational programs, witnessing first-hand the variety of procedures used to accomplish similar goals. Students perceived this as problematic and confusing, adding to the discrepancy between what is taught (theory) and what is practiced during their clinical placements (McCaugherty, 1991). McCaugherty continued by stating that some students may struggle to cope with this diversity and complexity and therefore need better explanations of the different practices and procedures that constitute reality.

Problems after graduation. Not only does research indicate that the theory-practice gap causes problems for students while still in school, but the presence of a theory-practice gap can also cause issues for students once they have entered the workforce. Hunt, Adamson, and Harris (1998) asked students who had graduated from a physiotherapist program at the University of Sydney if the presence of a gap existed between the knowledge/skills they had learned in school and what they needed in the workforce. The results indicated that the graduates perceived definite gaps. The respondents felt the largest gaps were in the areas of communication with patients, coping in the workplace, knowledge of the health industry and workplace management skills.
The results of this study provided evidence of a gap in the education programs for physiotherapists at the University of Sydney allowing educators to make changes to the program to better equip students with the skills and knowledge to work in the changing healthcare system.

Research in the fields of medicine, physiotherapy and nursing has shown students feel increased stress, anxiety, frustration and fear concerning the gap between what is taught in the classroom versus what is used in practice. Students in these healthcare professions also struggle with making the connection between what is taught in the classroom and what is used in the clinical setting. This gap needs to be investigated in athletic training education to see if our students are experiencing the same reactions. Lastly, if the theory-practice gap is present in athletic training education programs, we as educators need to address it to decrease the negative effects of a theory-practice gap as found in other professions. Addressing a theory-practice gap in athletic training would also better equip our students to be more effective in their clinical experiences.

**Methods to Bridge the Theory-Practice Gap**

Numerous suggestions have been brought forth in recent decades to help eliminate the gap between theory and practice. Most of the concepts fall into categories such as improving communication and collaboration, making changes to program curricula, changing the structure of faculty/practitioner position, incorporating evidence-based practice or a combination of all of these.
Improving Communication and Collaboration

Many researchers suggested that improving the communication between faculty instructors and practitioners who are supervising students would allow for more information sharing and collaboration to occur thus decreasing the theory-practice gap (Ferguson & Jinks, 1994; Corlett, 2000; Corlett et al., 2003; Baxter, 2007). For example, Corlett (2000) suggested that practicing nurses do more classroom lecturing. She also suggested that the link teacher, i.e., the instructor who goes between the classroom and the clinical settings, should be allowed to spend more time working in the wards, versus just visiting. Carr and Drummond (2002) looked at perceptions of collaboration and communication between athletic training faculty and preceptors and found that communication and cooperation between these two has an effect on the education of the students. Interestingly, students rated observations of communication at a significantly lower frequency than did the clinical and classroom instructors, however. Carr and Drummond (2002), like others, suggested including collaborative teaching methods, e.g., having athletic trainers serve in dual appointments and allowing students more exposure to the discussions that occur between classroom and preceptors of improving communication and collaboration.

In addition to partnering in instruction, Ferguson and Jinks (1994) suggested that instructors and practitioners should focus on conducting collaborative research to decrease the theory-practice gap. This would decrease the concern of practitioners that the research being published is not suited for practice. Rolfe (1996) agreed, saying that the research that practitioners are reviewing is unsuited for nursing practice. Little
research exists that focuses directly on the skills required for delivery of care. He agreed that researchers and practitioners need to collaborate to develop future knowledge and decrease the theory-practice gap.

Baxter (2007) added a new dimension to the communication and collaboration recommendations, incorporating the patient into the discussions. She presented the CCARE (communication, collaboration, application, reflection, evaluation) model of clinical supervision to bridge the theory-practice gap. One aspect of this model is communication including the teacher, practitioner, student and the patient. Baxter (2007) felt the patient is the bridge between theory and practice because they are the only people who can determine if the theory actually worked in practice.

**Changes in Curriculum**

Curricular changes are proposed by many authors as the means to bridge the theory-practice gap. Many suggested that changing the sequencing of the didactic and clinical components of the education program would help alleviate the gap (Ferguson & Jinks, 1994; Corlett, 2000), i.e., the teaching of theory and its practice need to occur more closely. Making students wait to apply a theory they learned in the classroom only adds to the theory-practice gap. Alexander (1983) agreed stating that ideally, theory should immediately precede or follow practice to augment learning. Ferguson and Jinks (1994) stated that the best way to accomplish curricular planning to ensure no gap, is to allow for joint curricular planning between faculty instructors and preceptors. Both should take part in planning what and when concepts are introduced, practiced and evaluated.
Many authors provided suggestions that included specific teaching methods as a means to reduce the theory-practice gap. Ferguson and Jinks (1994) and Prince et al. (2005) suggested using Problem-Based Learning methods to allow students to use theory to solve problems encountered in the clinical setting. Allowing students to analyze clinical events and problems in the classroom decreases the gap between what the students learn in the classroom and what they use in practice (Dale, 1994). Weller (2004) also explored bridging the gap by incorporating experiential learning techniques using simulation-based teaching methods. This was seen as beneficial to students in that they were able to use the theory they were learning in a mock situation.

Other recommendations included using reflective techniques to bridge the gap (Dale, 1994; Lander, 2000; Baxter, 2007; Ireland, 2008). Landers (2000) stated that allowing students to reflect on specific experiences produced self-directed learners, resulting in their ability to relate theory to practice more readily. Ireland (2008) concurred, recommending cultivating minds that can reflect on practice in order to teach students to become users of evidence. She, like many others, suggested students use clinical logs or journals to reflect on their practice in the clinical setting. Baxter (2007) continued the concept by saying that reflection allows students to analyze the effectiveness of applying theory to practice. She suggested the PALPATE approach to journaling. This approach starts with a Patient situation, Application of theory, Level of difficulty applying the theory, Patient outcomes/feedback, Analyze positive and negative characteristics of the theory, Theory appropriateness, and Evaluate the ability to apply this theory into practice. The PALPATE approach provides the student and preceptor a method to reflect
on the specific theory they applied on an actual patient to see if it actually worked. All of these suggestions allow for faculty instructors and preceptors to employ a more student-centered teaching approach, enabling students to make the connections between what is taught in the classroom and what is used in the clinical setting (Ferguson & Jinks, 1994).

The Structure of the Faculty/Practitioner Position

Another suggestion for bridging the theory-practice gap is to consider adapting the roles of the professionals who are responsible for teaching students in both the classroom and the clinical setting. In most medical and allied-health education programs, students are being taught theory by professionals who only teach in the classroom and are being taught clinically by professionals who only provide patient care and may not have any teaching skills. Alexander (1983) discussed this seclusion of tutors in the school and practitioners in the ward. She describes them as “two opposing camps” with the student struggling in the “no-man’s land” in between. Many authors suggested using the split appointment position in education programs to minimize the gap (Ferguson & Jinks, 1994; Quinn, 1995; Hewison & Wildman, 1996). The split appointment is a professional who spends half of their time teaching in the classroom and half of their time practicing clinically. Having students learn from instructors who are actually practicing the theory they are teaching in the classroom can be seen as beneficial. On the other hand, having dual responsibilities can be very taxing on healthcare professionals. However, Quinn (1995) describes the split position as a “coming together” of both positions for the benefit of all sides.
An additional suggestion about faculty position changes is the use of a link teacher (Gerrish, 1992; Dale, 1994; Quinn, 1995; Corlett, 2000; Landers, 2000). The link teacher role is one that today is termed the clinical coordinator. This position serves to link all aspects of the students’ educational process in the classroom to the clinical setting. Quinn (1995) suggested that the link teacher needs to be seen as part of the education team and not just a visitor to the ward. Gerrish (1992) agreed, stating that nurse teachers can provide the link from theory learned in the classroom to what they experience in the ward because nurse teachers operate from a broad knowledge base and plan the clinical placements that allow for integration of theory to practice. In order to teach effectively, nurse teachers need to be aware of current developments in clinical practice. They should, therefore, be in a position to provide a valuable resource to clinical colleagues in regard to new initiatives and their effect on the practice setting, and subsequently on the learning experiences of students (Gerrish, 1992).

Evidence-based Practice

Evidence-based practice is the most recent concept to be suggested as a means to minimize the gap between what is taught and what is practiced in all healthcare professions. Evidence-based practice is defined as the use of current best evidence in making decisions about the care of individual patients (Steves & Hootman, 2004). It is made up of three components: clinician expertise, patients’ preference and research evidence. Practitioners focus on research that deals with patient care day-to-day. At the same time Steves and Hootman remind us that clinical decisions are not made by research
evidence alone; the evidence should be combined with the practitioners’ past experiences and with the patients’ needs in mind.

Using evidence in practice is not a new concept. As early as 1991, the National Health Service (NHS) launched a national research and development program (as cited by Upton, 1999) aimed at closing the gap between healthcare demonstrated to be effective through research and what is actually delivered. Upton stated that using evidence-based practice may assist nursing in reducing the theory-practice gap by encouraging practitioners to focus on critical reading and analysis of literature in an effort to provide effective healthcare. This would then turn research into action which would decrease the gap between what is being talked about in the schools compared to what is being practiced in the ward. But Rolfe (1996) disagreed, saying that the research practitioners are reviewing is unsuited for nursing practice. Little research exists that focuses directly on the skills required for delivery of care in nursing. Researchers and practitioners need to collaborate to develop future nursing knowledge to solve this problem (Rolfe, 1996).

More recent research conducted by Jette et al. (2003) looked at the beliefs, attitudes, knowledge, and behaviors of physical therapists as they relate to evidence-based practice (EBP). The researchers then generated hypotheses about the relationship between these attributes and practice characteristics. Results showed that most respondents understand and believe that evidence is good to promote better practice, but very few actually use it in practice. The greatest barrier to using research in their practice reported by respondents was lack of time.
Not only is it important to know if practitioners are using evidence-based practice, but to truly use evidence as a means of closing the theory-practice gap, it is also important to see if evidence-based concepts are being taught in the classroom. If evidence-based knowledge is being utilized disproportionately between the classroom and the clinic, the theory-practice gap only expands. In theory, evidence-based practice and evidence-based teaching should occur at similar rates if the theory-practice gap is to be reduced. Manspeaker et al. (2011) studied the use of evidence-based teaching models in athletic training education. As part of the study, students were asked what they felt were barriers to using evidence-based practice resources. Many students felt that evidence-based practice is not always in agreement with what they were taught in class. What was taught in the classroom was not supported by what they observed in their clinical setting, thus providing some proof of a theory-practice gap in athletic training education.

**The Theory-Practice Gap in the Context of Athletic Training Education**

How does the theory-practice gap relate to athletic training? Although the educational process of athletic training students is similar to other allied healthcare professions, to date little research has looked at the concept of the theory-practice gap in athletic training. While the profession of athletic training is quite young, many of the suggested means of minimizing the theory-practice gap by nursing researchers have been employed in the curriculum development for the education of athletic trainers. In athletic training education programs, didactic and clinical education occur concurrently with students commonly attending classes in the morning and then attending clinical placements that
same afternoon. Ferguson and Jinks (1994) and Corlett (2000) both suggested changing the sequencing of the didactic and clinical components of the education program with the teaching of theory and its practice linked more closely. Although athletic training education employs both the classroom and clinical phases concurrently, little is known about how students feel about the connectedness of the classroom to their clinical placements.

Athletic training education not only has better sequencing of classroom knowledge and clinical knowledge compared to nursing education, but many programs also use athletic trainers in a multitude of positions like clinical educational coordinators, faculty/clinician split positions and trained preceptors. All of these concepts and practices were offered as a means to bridge the theory-practice gap in nursing and have been utilized to some extent in athletic training programs across the nation. Because of the rapid growth in accredited athletic training education programs, many athletic trainer practitioners who have previously worked in the clinical setting have been slowly migrating to faculty positions in educational settings. Certified athletic trainers have been moving into numerous educational roles ranging from program directors, to clinical education coordinators, adjunct faculty, split faculty/clinical positions, and preceptors. Over time, more and more athletic trainers have taken on an educational role full time, allowing the clinical aspects of their career to wane. Athletic training students thus may be getting their didactic information from faculty who have not practiced athletic training in quite some time. Students then go out to their clinical sites to work side by side with athletic trainers in the field who have minimal preceptor training.
Carr and Drummond (2002) measured the observations and perceptions of physical presence, cooperation, and communication between clinical and classroom instructors to determine if these attributes have a perceived effect on the education of the athletic training students. The authors stated that by having students learn in two different environments, the classroom and clinical settings, the students are exposed to potential theory-practice or theory-application gaps. Students rated observations of communication between clinical and classroom instructors at a significantly lower frequency compared to the ratings clinical and classroom instructors gave to communication frequency. All subject groups in their study felt that communication and cooperation between clinical and classroom instructors has an effect on the education of the students (Carr & Drummond, 2002).

Similar to the profession of nursing, athletic trainers have also been encouraged to use evidence-based practice as a means to develop the profession and subsequently increase the autonomy of athletic training professional practice. In order to accomplish this goal, athletic training education has added evidence-based practice competencies to the education of athletic training students by including many concepts specifically related to the evidence-based practice process in the 5th edition of Athletic Training Education Competencies (NATA, 2011). In theory, if evidence-based concepts are taught in the classroom and used in the clinical setting, the span between theory and practice should be decreased. In support of this practice is a commentary in the Athletic Training Education Journal (2006) which states that the teaching and practice of evidence-based practice needs to be emphasized in both the classroom and clinical settings to better integrate
didactic and clinical education (Knight, 2006). In addition, Manspeaker, Van Lunen, Turocy, Pribesh and Hankemeier (2011) conducted a study looking at the athletic training students’ perception of evidence-based concepts following an educational intervention. They found students felt what was taught in the classroom was not supported by what they observed in the clinical setting regarding evidence-based practice. The authors suggest that an integration of didactic information and clinical application could be augmented by increasing the evidence-based practice expectations of both faculty and practitioners. Increasing evidence-based content in both the classroom and the clinical setting thus could aid in bridging the theory-practice gap.

Although it has been found by Manpeaker et al. (2011) that athletic training students perceive a gap related to evidence-based practice, currently it is unknown if athletic training students perceive a gap between what is taught in the classroom and what is used in clinical placements. Additionally, it is unclear what impact a theory-practice gap may have on athletic training students. This study seeks to answer these questions.
CHAPTER 3

METHODODOLOGY

Currently the majority of literature on the presence of a theory-practice gap, the problems it creates and the suggestions to minimize it are found in nursing and the field of medicine. Little is known about the presence of a theory-practice gap in athletic training education. This mixed method research study measured athletic training students’ perception between what is taught in the classroom versus what is used during their clinical experiences. This study also looked at what impact a theory-practice gap has on athletic training students. Lastly, this study aimed to describe what sources athletic training students rely on for information, faculty versus preceptors and classroom versus clinical setting.

Overview of Methodology

The purpose of this chapter is to provide a description of the research methodology. The chapter includes a description of the participants, a description of the survey instrument, the procedures for conducting the research and lastly, describes how the results were processed and analyzed. The research questions were answered using a web-based survey sent out to all Commission on Accreditation of Athletic Training Education (CAATE) undergraduate programs in the United States. The tool had both closed and open-ended questions. Quantitative survey data was summarized using SPSS looking at descriptive statistics, while the open-ended survey data was evaluated for emerging themes.
Setting and Participants

The targeted population was students from all Commission on Accreditation of Athletic Training Education (CAATE) accredited undergraduate athletic training education programs in the United States. All participants had been formally admitted into their athletic training education program and had been in the clinical experience phase. When the study was administered, there were 340 CAATE accredited undergraduate athletic training programs in the nation that could have provided participants. Each program had approximately 15-40 students in the clinical phase. Potentially there were 5,100 to 13,600 students available to provide responses. Participation was voluntary.

Instrumentation

Qualtrics, a web-based survey tool provided for faculty and students by the University of Minnesota Duluth, provided the format and process for collecting data. This tool was accessed by means of a web address and allowed for several types of responses—selected, sliding scale and open-ended. Creswell (2002) encourages the utilization of electronic surveys in order to collect data efficiently.

The survey tool consisted of 19 questions. Eight questions related to demographic information allowing for a comparison of the respondents’ characteristics. Gender, age, NATA district, institution size, number of clinical rotation assignments and level in the program were determined.

The remaining eleven questions aimed to measure students’ perception between what is taught in the classroom setting versus what is taught in their clinical experiences. Using
the 5th Edition NATA Educational Competencies (National Athletic Trainers’ Association, 2011), the survey tool addressed the presence of skill discrepancies between classroom and clinical experience and how frequently discrepancies were noticed by participants. Participants were also asked if there is a positive or negative impact, educationally or emotionally, to discrepancies noted between classroom and clinical experiences and how they managed any discrepancies. In addition, participants were asked to distinguish between trusted information sources, information learned in the classroom and information learned during clinical experiences, as the most accurate information source for them while in the program. Participants were asked to respond using a multitude of response methods, selected response, sliding scales, and open ended.

Recent research in athletic training education hinted at the presence of a theory-practice gap in athletic training education. Carr and Drummond (2002) discussed collaboration between athletic training faculty and preceptors as a method to bridge gaps between the classroom and clinical experiences. Manspeaker et al. (2011) stated that students noticed a gap between the classroom and clinical experience in the content area of Evidence-Based Practice. Since there is no current research that directly demonstrates the presence of a theory-practice gap in athletic training education, the initial questions of the survey were directed at determining if students perceived a gap and in what areas of athletic training education the gaps were noticed. Additional questions addressed the frequency that students noticed differences between the classroom and clinical experiences.
Questions that required open-ended responses might also appear if a participant responded “yes” to having a discrepancy affect them emotionally. Participants were then asked to describe in what way the discrepancy affected them emotionally. In previous studies looking at the theory-practice gap in nursing and medicine, the presence of a gap had a negative effect on students. Elkan and Robinson’s (1993) study of the theory-practice gap in nursing found that students felt left in the middle, feeling awkward and ill at ease during some of their early ward placements. Cooke (1996) found similar emotions from students in nursing programs. She indicated that students felt “anxiety,” “apprehensive,” “worried,” and “dubious” when working in nursing departments. Thus, open-ended questions existed in this study to identify management strategies used in dealing with discrepancies and the affect any discrepancies had on the participants’ learning over time. See Appendix A for a copy of the web-based survey which was converted to a Word document.

**Procedure**

Using the Commission on Accreditation of Athletic Training Education (CAATE) website, a list of all program directors of undergraduate athletic training education programs was generated. All athletic training program directors were contacted via e-mail to request participation of their students in the study. The program directors were sent information regarding the purpose of the study and the survey tool link, which included the consent form, and were asked to forward the information and survey to their athletic training students if they agreed to participate. See Appendix B for the letter sent to the program directors to participate.
If program directors agreed to be part of the study, they forwarded the request to their students. Students had a choice of participating or not, and were given the link and instructions for submitting their responses. Program directors were also sent a reminder email 2 weeks following the initial contact asking them to resend the survey link to their students. At that time, program directors were also asked to email back, the total number of students who met the requirements and were sent the survey. This request allowed for a more accurate count of the sample. See Appendix C for the consent form which appeared on the first page of the survey.

All data was collected and housed in the password protected online web-based survey tool, Qualtrics.

**Data Processing and Analysis**

Raw data obtained from the survey tool was transferred and analyzed using SPSS descriptive and inferential statistics. The data was housed in Qualtrics which was transferred to SPSS. With the quantitative data, measures of central tendency and measures of variability were evaluated. $T$-test values were run on multiple survey questions where comparison between experienced and inexperienced student responses was needed. *Chi-Square* was used as a method of analysis to compare percentages between inexperienced and experienced athletic training students in research question one. All tests of significance were carried out at an alpha level of $p \leq .05$.

Qualitatively, the open-ended responses were grouped and analyzed for common themes emerging from responses related to emotional impact, management strategies and effect on learning over time. These themes provided a greater understanding of how
students view and manage any differences between the classroom and the clinical experiences.

Qualtrics web-based survey software allowed for complete anonymity of all participants. The survey questions did not provide any information that would identify participants or their institutions. Demographic data only allowed for determining which National Athletic Training Association District the respondents were from and which level the institution competes athletically. In reporting finding from this research, total anonymity and confidentiality were maintained. This study received IRB approval from the University of Minnesota (See Appendix D).

**Validity of Measures**

Content validity of the survey was determined by the relationship of the questions to the existing research outlined in the literature review. Topic relevance and breadth of knowledge related to the domain of the theory-practice gap in nursing and medical research informed the questions in the survey. Research contributing to the content of the survey included Cooke, 1996; Prince et al., 2000; Hislop et al., 1996; Sharif, 2005; Corlett, 2000; and McCaugherty, 1991.

**Summary**

To determine if undergraduate athletic training students perceived a discrepancy between what they are taught in the classroom and what they see used in their clinical experiences, as well as reactions if such a gap exists, a mixed method survey tool using Qualtrics, a web-based survey software program, was developed. All students attending
Commission on Accreditation of Athletic Training Education (CAATE) undergraduate programs in the United States were invited to participate, via an online invitation from their program directors. Descriptive and inferential statistics were used to analyze the quantitative data, and themes were drawn from the qualitative data derived from the open ended questions.
CHAPTER 4

RESULTS

The purpose of this study was to determine if athletic training students perceive a difference between what they are taught in the classroom by faculty athletic trainers versus what they see practiced in the clinical setting by preceptors. In addition, this study aimed to examine what effect, if any, the presence of a theory-practice gap creates for athletic training students and how they manage any differences. Lastly, this study examined which resources athletic training students use for addressing questions when a discrepancy arose, classroom versus clinical information and faculty versus preceptors’ knowledge. This chapter will present the data and key findings obtained through the web-based survey of undergraduate athletic training students across the nation.

Survey Population and Sample

The survey link was emailed to all 340 undergraduate program directors of Commission on Accreditation of Athletic Training Education (CAATE) accredited programs. Forty-four program directors (12.9%) reported the number of students to whom they distributed the survey. Thus, 1,500 undergraduate athletic training students received the request to take the survey. The number of undergraduate athletic training students that took the survey was 435, resulting in a 29% response rate. Throughout the survey students were not forced to respond to any questions, thus the total numbers in the following statistics are not necessarily equal to 435. Therefore, the n values and percentages are provided throughout the results section.
Demographic Data

Respondents included 298 females (70%) and 125 males (30%). Seventy-nine percent (n=335) of the respondents were between the ages of 20-24. Sixty-four respondents (15%) reported being 16-19 years old, leaving 24 respondents over the age of 25 years old (5%).

Responses were reported from all ten of the National Athletic Trainers’ Association districts. The largest percentage (43%) of respondents attended school in District 4 (Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin) of the National Athletic Trainers’ Association (n=183). The distribution of respondents by NATA district can be seen in Figure 1.

<table>
<thead>
<tr>
<th>District</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>District 1</td>
<td>15</td>
</tr>
<tr>
<td>District 2</td>
<td>21</td>
</tr>
<tr>
<td>District 3</td>
<td>48</td>
</tr>
<tr>
<td>District 4</td>
<td>183</td>
</tr>
<tr>
<td>District 5</td>
<td>49</td>
</tr>
<tr>
<td>District 6</td>
<td>23</td>
</tr>
<tr>
<td>District 7</td>
<td>11</td>
</tr>
<tr>
<td>District 8</td>
<td>14</td>
</tr>
<tr>
<td>District 9</td>
<td>31</td>
</tr>
<tr>
<td>District 10</td>
<td>27</td>
</tr>
</tbody>
</table>

*Figure 1. Respondents by NATA Districts*

Almost half (49%) of the respondents attended institutions that primarily participate in NCAA Division I athletics (n=207). Of the remaining respondents, 25% (n=106) were
enrolled at NCAA Division II institutions, 22% \((n=94)\) went to NCAA Division III institutions and 4% \((n=16)\) attended NAIA institutions.

The duration of the professional phase of undergraduate athletic training education programs (ATEP) having students respond, ranged from two to four years. The majority (56%) of respondents attended programs that were three years in length \((n=236)\). Having two year and four year programs was reported by 10% of respondents each \((n=44, n=43\) respectively). Seventeen percent of respondents attended two and a half year programs \((n=70)\). Lastly, 7% of students went to institutions that have programs following three and a half year curricular plans \((n=29)\).

The number of semesters completed in their respective athletic training education programs and thus experience that the respondents had ranged from being in their first semester 24% \((n=101)\) to being in their 7\textsuperscript{th} semester 1% \((n=6)\). Four hundred twenty-three out of 435 students responded to this question. See Table 1.

Table 1

*Number of Completed Semesters*

<table>
<thead>
<tr>
<th>Semesters</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 semesters complete (Currently in the first semester)</td>
<td>101</td>
<td>24</td>
</tr>
<tr>
<td>1 Semester Complete</td>
<td>33</td>
<td>8</td>
</tr>
<tr>
<td>2 Semesters Complete</td>
<td>92</td>
<td>22</td>
</tr>
<tr>
<td>3 Semesters Complete</td>
<td>50</td>
<td>12</td>
</tr>
<tr>
<td>4 Semesters Complete</td>
<td>91</td>
<td>22</td>
</tr>
<tr>
<td>5 Semesters Complete</td>
<td>24</td>
<td>6</td>
</tr>
<tr>
<td>6 Semesters Complete</td>
<td>26</td>
<td>6</td>
</tr>
<tr>
<td>7 Semesters Complete</td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>
Respondents were also asked how many of their athletic training education programs employ dual role certified athletic trainers, those who both teach within the academic program and work clinically with patients. The majority, 72% of respondents reported that their ATEPs do have athletic trainers who primarily provide patient care but also teach in their curriculum programs \( n = 302 \). Twenty-three percent \( n = 97 \) reported that they did not have dual role athletic trainers, with the remaining 5% \( n = 23 \) being unsure. The majority of athletic training programs (90%) reported having one to four dual role athletic trainers \( n = 269 \).

**Findings**

**Research Question One**

Research question one aimed to determine the extent athletic training students perceive a difference between the information taught in the classroom and what is used in practice in their clinical settings. Survey questions number 9, 10 and 11 addressed this question. The majority of respondents stated that they did perceive a difference between what they were taught in the classroom compared to what was used in their clinical experiences/rotations with 62.8% responding yes and 30.6% responding no \( n = 406 \) of 435).

Survey question 10 continued to decipher in which of the eight NATA Educational Competency areas students perceived a difference between classroom and clinical experience (5th Edition NATA Educational Competencies). Results indicated that students perceived the greatest difference within the NATA Educational Competency area of Therapeutic Intervention, including modalities, conditioning, rehabilitation and
pharmacology (45.2%). Second to Therapeutic Intervention was Clinical Examination and Diagnosis (39.3%), followed by Evidence-Based Practice (34%).

Survey question 11 also addressed research question one asking respondents to note the frequency in which they noticed a difference between their classroom and the clinical experience. Respondents used a slider scale ranging from zero to 100. Zero served as a response of “never,” 25 was equivalent to “rarely,” 50 served as “sometimes,” 75 was equivalent to “quite often” and lastly 100 held the meaning of “very often.” Four hundred of the 435 respondents indicated a frequency with a mean score between “rarely” and “sometimes” ($M=41.57, SD=19.51$). Thus, 68% of the responses fell between 22 which are below “rarely” to 61 which fell between “sometimes” and “quite often.” See Table 2 for all results pertaining to research question one.

Table 2

<table>
<thead>
<tr>
<th>Degree of Perceiving a Difference between Classroom and Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variable/Question</strong></td>
</tr>
<tr>
<td>Do you notice a difference?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Areas of Perceived Differences</strong></th>
<th><strong>n</strong></th>
<th><strong>Yes (%)</strong></th>
<th><strong>No (%)</strong></th>
<th>NS$^a$(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence-Based Practice</td>
<td>409</td>
<td>34.0</td>
<td>45.7</td>
<td>20.3</td>
</tr>
<tr>
<td>Prevention and Health Promotion</td>
<td>408</td>
<td>23.8</td>
<td>66.9</td>
<td>9.3</td>
</tr>
<tr>
<td>Clinical Examination and Diagnosis</td>
<td>407</td>
<td>39.3</td>
<td>58.0</td>
<td>2.7</td>
</tr>
<tr>
<td>Acute Care of Injury and Illness</td>
<td>410</td>
<td>28.5</td>
<td>69.8</td>
<td>1.7</td>
</tr>
<tr>
<td>Therapeutic Interventions</td>
<td>409</td>
<td>45.2</td>
<td>49.1</td>
<td>5.6</td>
</tr>
<tr>
<td>Psychosocial Strategies and Referral</td>
<td>407</td>
<td>21.6</td>
<td>52.8</td>
<td>25.6</td>
</tr>
<tr>
<td>Healthcare Administration</td>
<td>406</td>
<td>22.2</td>
<td>58.9</td>
<td>19.0</td>
</tr>
<tr>
<td>Professional Development and Responsibility</td>
<td>409</td>
<td>21.3</td>
<td>68.7</td>
<td>10.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Frequency</strong></th>
<th><strong>n</strong></th>
<th><strong>Mean</strong></th>
<th><strong>SD</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>How often you notice a difference (0-100)</td>
<td>400</td>
<td>41.57</td>
<td>19.51</td>
</tr>
</tbody>
</table>

*Note. “NS= Not sure.*
Previous research conducted by Hislop, Cope, Stoddart and McIntosh (1996) and Corlett (2000) on nursing students suggested that age or level in the program resulted in different perceptions of the theory-practice gap. Thus, the data from this survey were also analyzed based on athletic training students’ experience level. Respondents were asked to provide how far along, via number of completed semesters, they were in their respective programs. Students were then divided into two groups, inexperienced and experienced athletic training students. Because athletic training education programs can vary in length from a minimum of two year (four semesters) to possibly taking eight semesters to complete the program, inexperienced students \( (n=226) \) were those that had completed zero to two semesters (one year) of core athletic training coursework (53%). Students who had completed more than three semesters \( (n=197) \) of core athletic training coursework were placed in the experienced athletic training student group (47%). Additional data analysis was conducted on each research question based of the difference experience levels of respondents. See Table 3 for degree of perceived differences based on experience level.
Overall, there was no significance \((p=.79)\) found between inexperienced and experienced athletic training students in regard to their perception of a difference between the classroom and their clinical experiences. Analyzing the eight NATA Competency Areas, three of the NATA Educational Competencies resulted in significant findings between the inexperienced and experienced athletic training students. Evidence-based practice \((p=.01)\), Therapeutic Intervention \((p=.02)\), and Healthcare Administration \((p=.03)\) all had significant differences based on experience level. Evidence-based practice, Therapeutic Intervention, and Healthcare Administration showed experienced athletic training students perceived more of a difference in these content areas between the classroom and clinical experiences than the inexperienced group. Lastly, there was no significance found between the inexperienced and experienced athletic training students concerning frequency of differences between classroom and clinical experience \((p=.10)\).
Research Question Two

Research question two asked what effect a difference between the classroom and clinical experience had on athletic training students. These five survey questions asked respondents if the difference had a positive or negative effect on their learning experience. It further broke down any effect on their learning of knowledge, learning of skills and performance of skills and on exams. Using a sliding scale ranging from -100 to +100, respondents were asked what impact a difference between the classroom and clinical experience had on their learning experience, negative (-100) or positive (100) impact. Overall, respondents felt the difference favored a positive impact ($M=31.7$, $SD=44.5$) on their learning experience. Thus 68% of responses fell between -12.8 to +76.2, thus demonstrating that most students leaned towards the difference having a positive impact on their learning. There was no significant difference ($p=.65$) found between inexperienced and experienced athletic training students regarding positive or negative impact on learning experience. See Table 4 and Table 5 for the effect of theory-practice gap on students.

Using a sliding scale ranging from “none” (0) to “a lot” (+100), respondents were also asked if the difference between classroom and clinical experience had an impact on them emotionally. If respondents stated that there was any emotional effect over a “little,” (25) on the scale of “none” to “a lot,” an open-ended question appeared asking the respondent to explain their emotions regarding differences between the classroom and clinical experience. Overall, 315 respondents felt there was slightly more than a “little” impact on them emotionally when a difference occurred between the classroom and
clinical experience ($M=29.9$, $SD=24.6$). There was no significance ($p=.50$) found between inexperienced and experienced athletic training students regarding effect on them emotionally. See Table 4 and Table 5 for the effect of theory-practice gap on students.

Analysis of the question 14 resulted in 125 open-ended responses. Question 14 asked respondents to describe in what way a difference between the classroom and clinical experience affected them emotionally. The majority of respondents gave examples of feeling stress ($n=28$), confusion ($n=20$) and frustration ($n=22$). Additionally, students felt a theory-practice gap caused then to question things ($n=9$), caused them to feel less confident in their abilities ($n=9$) and made it hard/difficult to know what was right ($n=9$). Other emotions provided in the open-ended responses included feeling anxious, nervous, discouraged, irritated, caught in the middle and less motivated to study for classes. Ten respondents felt the theory-practice gap led to positive emotions allowing them to see and learn things in a multitude of ways. One respondent stated that “it helps them understand what they learn in class” while another respondent stated it causes them to “reflect more and creates an important learning experience”.

Lastly, respondents were asked to use a sliding scale to report if a difference between the classroom and clinical experience had an impact on their learning of knowledge, learning of skills, performance of skills or had an impact on taking written/practical examinations. Responses ranged from zero (never) to 100 (all the time). Respondents reported similar responses for all areas of impact: learning of knowledge ($M=41.2$, $SD=28.8$), learning of skills ($M=44.2$, $SD=27.8$), performance of skills ($M=46.4$, $SD=27.8$), and taking written/practical examinations ($M=38.3$, $SD=24.2$).
SD=29.0) and taking examinations (M=40.8, SD=29.6). Comparing inexperienced and experienced athletic training student data, there was no significant difference found in any area of impact. See Table 5 for effects of a theory-practice gap based on experience level, including p-values.

Table 4.

<table>
<thead>
<tr>
<th>Variable/Question</th>
<th>n</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact on…</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Your learning experience? (-100 to +100)</td>
<td>368</td>
<td>31.7 (44.5)</td>
</tr>
<tr>
<td>You emotionally? (0-100)</td>
<td>315</td>
<td>29.9 (24.6)</td>
</tr>
<tr>
<td>Your learning of knowledge (0-100)</td>
<td>317</td>
<td>41.2 (28.8)</td>
</tr>
<tr>
<td>Your learning of skills (0-100)</td>
<td>305</td>
<td>44.1 (27.8)</td>
</tr>
<tr>
<td>Your performance of skills(0-100)</td>
<td>305</td>
<td>46.4 (29.0)</td>
</tr>
<tr>
<td>Your Taking written/practical exam(0-100)</td>
<td>299</td>
<td>40.8 (29.6)</td>
</tr>
</tbody>
</table>

Table 5.

<table>
<thead>
<tr>
<th>Variable/Question</th>
<th>Inexperienced</th>
<th>Experienced Group</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Mean (SD)</td>
<td>n</td>
</tr>
<tr>
<td>Impact on…</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Your learning experience? (-100 - 100)</td>
<td>198</td>
<td>31.3 (42.3)</td>
<td>169</td>
</tr>
<tr>
<td>You Emotionally? (0-100)</td>
<td>172</td>
<td>29.2 (24.4)</td>
<td>141</td>
</tr>
<tr>
<td>Your learning of knowledge (0-100)</td>
<td>172</td>
<td>39.6 (28.8)</td>
<td>143</td>
</tr>
<tr>
<td>Your learning of skills (0-100)</td>
<td>168</td>
<td>43.8 (28.4)</td>
<td>136</td>
</tr>
<tr>
<td>Your performance of skills(0-100)</td>
<td>169</td>
<td>45.2 (29.1)</td>
<td>135</td>
</tr>
<tr>
<td>Your Taking written/practical exam(0-100)</td>
<td>169</td>
<td>38.6 (29.0)</td>
<td>129</td>
</tr>
</tbody>
</table>

The next two questions in the survey were open-ended questions and were analyzed for common themes. Of the 435 respondents, 328 provided responses to survey question 16 which asked respondents to describe how they handle the situation if differences between the classroom and clinical experience occurred. What do they do? Of
the 328 respondents, 200 students stated that they ask questions when they see a difference. Some respondents specified with whom they inquired. Sixty-four students asked questions of their Preceptor only. Only 11 students asked questions of their faculty athletic trainers, while 22 mentioned both preceptor and faculty being sought out for clarifications. A few respondents also mentioned asking upper-classman for information \((n=6)\). Some respondents who asked their preceptors for clarification received feedback about the difference between the classroom and clinical settings. For example, one respondent said, “We talk with our preceptors about what we learned in class and compare why there are differences. Most of the time their explanation makes sense since athletes do not usually have cookie-cutter, straight from the textbook injuries.” Another respondent stated, “I point it out and my preceptor says that there needs to be a happy medium between the perfect world of academia and the real world of professional practice.”

Fifty-five respondents stated that they handled the situation in more of a positive way, “trying to make the best of it”. Many stated that they take the opportunity to learn and expand their knowledge and see it as a learning experience. One respondent said “I do my best to absorb both techniques and try to determine which is the more effective of the two.”

Several \((n=16)\) students mentioned exams and tests in their responses. Many students learn the “preferred” method/information for the test and then go back to the way they learned the information in their clinical settings. “I often disregard the information we learn in class that is not applied in the clinical rotations after we are tested on it.” Another
student said “Memorize it for the class until the test is over and focus on really understanding the clinical application and knowledge.” Lastly, one respondent stated

I separate things in my mind into “classroom” and “rotation”. In other words, I try to recognize information that is actually going to be value apart from information that I just need to memorize and recall for an exam, then forget.

Six respondents relied on classroom information more. One provided a reason that they “rely on classroom information because it is more BOC based.” Another student said “The grade in the class is what matters for my GPA so even if my teacher is wrong” she goes with the classroom information.

Some students described handling the situation by adjusting what they do to where they are or whom they are working with. “Where ever I am, (clinical/classroom), I do things the way that place likes them done” or “When working with a specific certified, I go along with their way of thinking when I am at their rotation.”

Lastly, several students stated that they do nothing to handle the difference, just acknowledge that it exists. One respondent does nothing stating “In the beginning I would mention it, but over time it became apparent that how we are taught is more often than not, not how we will do things as ATs, so I stopped mentioning it.”

Question 17 asked respondents to describe how a difference between the classroom and clinical experience had affected their learning over time or their development as a future athletic trainer. Of the 435 respondents, 315 provided responses to survey question 17. Of the 315 respondents, over 70% felt the difference between the classroom and clinical experience had a positive impact on their learning over time and their development as a future athletic trainer. The majority of respondents felt the differences
provided different and multiple ways to look at the same information \(n=89\), thus feeling that their knowledge had been broadened and expanded \(n=39\). They also commented on how this would make them better athletic trainers in the future. One student stated, “It helps me to gain knowledge on how to curtail my practice to my needs and helps me develop.” Fifteen respondents stated that the difference has improved their problem-solving skills and their ability to critically think. One respondent said “Actually has taught me to see the world through different viewpoints and causes me to think analytically and critically about WHY I do what I choose to do.” And another stated “Forces me to be more diverse, think critically about why things are done.” Respondents also used statements like helping them be more “dynamic”, “creative” and “adaptive”.

Six respondents mentioned using evidence-based practice, stating “It has opened my eyes to the fact that sometimes there are many different ways to do something and evidence-based practice is vitally important.”

Although most respondents could see the positive impact of the difference between the classroom and clinical experience, many \(n=73\) felt that it had a negative impact on their learning over time and development as a future athletic trainer. Many felt that is was confusing and frustrating to learn something in the classroom and then be told you are doing it wrong out in practice or vice versa. Some respondents felt at times, the classroom information seemed like a “waste of their time” to learn because it was never applied clinically. Many \(n=12\) respondents also found the difference made test taking difficult. “It sometimes causes difficulty during tests because one method is preferred
outside of class but it’s not necessarily standard.” Another respondent described the following situation:

Being taught one way then watching it done another way, I am better hands-on, so I learn more in the athletic training room and then I get things wrong on exams or practicals because I do them the way I learned in the ATR and not in class.

A few (n=4) students framed the disconnect between classroom and clinical experience in athletic training a little differently by stating that the difference makes students feel that there is information that is necessary to become an athletic trainer or to pass a class or the Board of Certification (BOC) exam (n=6), but there is a different kind of information that students need to be an athletic trainer. One respondent said:

There then becomes a split between what you need to know to pass a class and what you need to know to be a good athletic trainer. I don’t think it’s had too big of an impact on my future career, you just need to learn what to put in the front of your mind and what to put in the back.

Twenty-eight respondents stated that the connection between the classroom and clinical information is a positive aspect of athletic training education. Many pointed out that you need to learn the foundation or base information from the classroom and then apply it in a hands-on, real-life situation to learn better. One respondent said it best stating, “It has a positive effect on my learning and development as a future A.T. Everything learned in the classroom applies to the field, it’s just a matter of connecting the two.” Another student said it “just makes everything come together, it all makes sense.”
Research Question Three

The third research question sought to determine what sources athletic training students rely on for information when a difference between classroom and clinical experience arose. The survey addressed the source of classroom versus clinical information, and faculty versus preceptor as the students’ source of knowledge. Slider scales were used with classroom/faculty information scoring -100 to zero and clinical/preceptor information scoring zero to +100. The zero landmark served as both, equally being used as resources for students. Respondents were asked which source they most frequently leaned towards for making decisions with the NATA Educational Competencies content areas.

Of the eight content areas, respondents only slightly leaned towards the classroom information in three areas, Evidence-Based Practice ($M=-7.2$, $SD=49.0$) Prevention and Health Promotion ($M=-3.4$, $SD=42.9$) and Healthcare Administration ($M=-6.3$, $SD=43.4$). All other Competency areas leaned towards clinical information as the most frequent source with Acute Care of Injury and Illness ($M=29.1$, $SD=40.1$) and Clinical Examination and Diagnosis ($M=25.5$, $SD=44.0$) representing the most. All eight of the NATA Educational Competencies areas resulted in very large standard deviations demonstrating that the majority of respondent lean towards their clinical experience information when making decisions. The differing $n$ values should also be noted for each response. See Table 6 for more detailed information.
Analysis of the source of information data based on experience level, indicated that there was no significance found between inexperienced and experienced students in any of the NATA competency areas. See Table 7 for information source based on level of experience.

Table 7.
Information Source: Classroom (-100-0) vs. Clinical (0-100) by Inexper. and Exper. Groups

<table>
<thead>
<tr>
<th>Variable/Question</th>
<th>Inexperienced Gr</th>
<th>Experienced Gr</th>
<th>t (df)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence-Based Practice</td>
<td>165 -8.1 (50.4)</td>
<td>138 -5.7 (47.4) -1.42 (301) 0.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevention and Health Promotion</td>
<td>162 -5.2 (40.1)</td>
<td>131 -1.0 (46.3) -0.82(291) 0.41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical Examination and Diagnosis</td>
<td>166 22.2 (41.5)</td>
<td>137 29.3 (46.8) -1.39 (301) 0.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute Care of Injury and Illness</td>
<td>163 27.5 (39.0)</td>
<td>132 30.9 (41.6) -0.72 (293) 0.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Therapeutic Interventions</td>
<td>162 25.4 (41.3)</td>
<td>133 17.4 (47.7) 1.55 (293) 0.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychosocial Strategies and Referral</td>
<td>145 0.1 (43.0)</td>
<td>117 2.2 (44.9) -0.38 (260) 0.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healthcare Administration</td>
<td>150 -3.9 (42.1)</td>
<td>124 -9.4 (45.0) 1.06 (272) 0.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional Development and Responsibility</td>
<td>152 19.2 (48.0)</td>
<td>122 16.7 (48.8) 0.44 (272) 0.66</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The final survey question asked respondents with whom they consult for information in the eight NATA Educational Competencies areas. Athletic Training Educational faculty were on one end of the spectrum (score of -100) while Athletic Training preceptors were on the other end of the spectrum (score of +100). A score of zero represented both faculty and preceptors being equally consulted for information. Overall,
students consult with their preceptors for information regarding six of the competency areas. Only two competency areas, Evidence-Based Practice \((M=-15.0, SD=58.2)\) and Healthcare Administration \((M=-3.4, SD=58.6)\) show results with scores slightly leaning towards athletic training faculty being consulted for information. Respondents consult the preceptor the most for information regarding Acute Care of Injury and Illness \((M=36.5, SD=50.4)\) and Clinical Examination and Diagnosis \((M=34.2, SD=51.4)\). All eight of the NATA Educational Competencies areas resulted in very large standard deviations demonstrating that the majority of respondents lean towards their preceptors for information. The differing \(n\) values should also be noted for each response. See Table 8 for whom respondents consult with for information.

Table 8.  
*Information Source: Faculty (-100-0) vs. Preceptor (0-100)*

<table>
<thead>
<tr>
<th>Variable/Question</th>
<th>n</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence-Based Practice</td>
<td>279</td>
<td>-15.0 (58.2)</td>
</tr>
<tr>
<td>Prevention and Health Promotion</td>
<td>274</td>
<td>11.3 (53.1)</td>
</tr>
<tr>
<td>Clinical Examination and Diagnosis</td>
<td>280</td>
<td>34.2 (51.4)</td>
</tr>
<tr>
<td>Acute Care of Injury and Illness</td>
<td>277</td>
<td>36.5 (50.4)</td>
</tr>
<tr>
<td>Therapeutic Interventions</td>
<td>269</td>
<td>20.9 (56.9)</td>
</tr>
<tr>
<td>Psychosocial Strategies and Referral</td>
<td>244</td>
<td>9.3 (57.8)</td>
</tr>
<tr>
<td>Healthcare Administration</td>
<td>251</td>
<td>-3.4 (58.6)</td>
</tr>
<tr>
<td>Professional Development and Responsibility</td>
<td>254</td>
<td>12.1 (57.6)</td>
</tr>
</tbody>
</table>

Analysis of whom students consult for information based on the content areas of the NATA Educational Competencies broken down by experience level showed no significance in all eight NATA Competency areas. See Table 9 for whom respondents consult based on experience level.
In summary, research question one resulted in 62.8% of respondents perceiving a difference between what they are taught in the classroom versus the clinical experience. The three NATA Educational Competency areas that students perceived the most difference are Therapeutic Intervention, Clinical Examination and Diagnosis and Evidence-Based Practice, respectively. Significant findings were also found in the competency areas of Therapeutic Intervention, Evidence-Based Practice, and Healthcare Administration when respondents were divided into experienced and inexperienced athletic training students.

Research question two presented information about the effect the theory-practice gap had on students and their learning. Although respondents felt the effect leaned to having a positive impact on their learning experience, the range of responses was very wide with a $SD=44.5$. There was no significant findings on the effect of a theory-practice gap on students when divided by experience level. When asked how the difference affects the

<table>
<thead>
<tr>
<th>Variable/Question</th>
<th>Inexperienced Gr</th>
<th>Experienced Gr</th>
<th>t (df)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence-Based Practice</td>
<td>153 -15 (59.3)</td>
<td>123 -15.7 (57.6)</td>
<td>0.16 (274)</td>
<td>0.88</td>
</tr>
<tr>
<td>Prevention and Health Promotion</td>
<td>153 11.2 (52.3)</td>
<td>119 11.7 (54.3)</td>
<td>-0.09 (270)</td>
<td>0.93</td>
</tr>
<tr>
<td>Clinical Examination and Diagnosis</td>
<td>154 30.7 (52.4)</td>
<td>124 38.5 (50.5)</td>
<td>-1.26 (276)</td>
<td>0.21</td>
</tr>
<tr>
<td>Acute Care of Injury and Illness</td>
<td>152 33.8 (52.3)</td>
<td>123 40.5 (47.8)</td>
<td>-1.10 (273)</td>
<td>0.27</td>
</tr>
<tr>
<td>Therapeutic Interventions</td>
<td>143 19.3 (56.0)</td>
<td>124 23.3 (58.2)</td>
<td>-0.58 (265)</td>
<td>0.57</td>
</tr>
<tr>
<td>Psychosocial Strategies and Referral</td>
<td>137 8.34 (56.6)</td>
<td>105 10.0 (59.2)</td>
<td>-0.22 (240)</td>
<td>0.83</td>
</tr>
<tr>
<td>Healthcare Administration</td>
<td>138 -7.0 (57.6)</td>
<td>111 1.6 (60.0)</td>
<td>-1.15 (247)</td>
<td>0.25</td>
</tr>
<tr>
<td>Professional Development and Responsibility</td>
<td>140 8.59 (60.6)</td>
<td>112 16.5 (54.2)</td>
<td>-0.09 (250)</td>
<td>0.28</td>
</tr>
</tbody>
</table>

Table 9.
Information Source: Faculty (-100-0) vs.Clinical Instructor (0-100) for Inexp. and Exp. Groups
students emotionally, the majority of students described feeling stressed, confused and frustrated. Methods used to handle any differences between the classroom and clinical experience mainly included asking questions of either their preceptor or faculty. When asked how the difference affects learning over time or their future as athletic trainers, the majority of respondents felt the difference provided a positive impact on their learning, broadening and expanding their learning to include a multitude of ways to deal with patient care.

Research question three resulted in respondents leaning more towards their clinical experiences for information when making decisions although there were wide standard deviations for all eight NATA Educational Competencies areas. When analyzed by experience level, no significant findings could be found when comparing inexperienced and experienced students.

In regard to faculty or preceptors being consulted for information, six of the eight NATA Educational Competencies areas leaned more towards the preceptor. Once again, there were high standard deviations for all eight content areas. When broken down by student experience level, no significance was found in any of the eight NATA Competency areas.
CHAPTER 5
DISCUSSION AND CONCLUSION

Overview of the Study

The idea of a theory–practice gap is not new. Bertrand Russell wrote about it in 1967 and described “knowledge by description” versus “knowledge by acquaintance” (as cited by McCaugherty, 1991, p.1056). Previous research, specifically in nursing education, conducted on the issue of theory-practice gaps has indicated that students are greatly affected by the differences found between what students are taught in the classroom and what they experience in the clinical setting. The allied health profession of athletic training and the formalized education of athletic trainers is fairly young in comparison to other healthcare professions like nursing and medicine. Little research on the theory-practice gap and its effect on students had been conducted within the profession of athletic training. Thus, this study aimed to measure athletic training students’ perceptions of the prevalence of a theory-practice gap and its effect on their current education and effect on their learning over time. The research questions were:

1. To what extent do athletic training students perceive a difference between the information taught in the classroom and what is used in practice?
2. What effect does a theory-practice gap have on athletic training students? If students perceive a theory-practice gap, how do they manage any differences?
3. What source do athletic training students rely on for information? Classroom versus clinical information? Faculty versus preceptor as the primary source of knowledge?
A web based survey link was sent to all 340 CAATE accredited undergraduate athletic training education program directors, asking if they would forward the survey to their students. Four hundred thirty-five athletic training students accepted the invitation to complete the survey, representing each of the ten National Athletic Trainers’ Association districts across the nation. The survey tool consisted of 19 questions, eight demographic, three open-ended, and the remaining questions were multi-select and slider-scale format. Throughout the survey, students were not forced to respond to any questions, thus the total numbers in the statistics are not necessarily equal to 435.

**Discussion of Findings**

The sample in this study (n=435) represented 29% of the responding undergraduate athletic training students from all 10 National Athletic Trainers’ Association Districts. Because the survey tool was sent to all undergraduate athletic training students in the United States, it had strong population validity which allows for generalizability.

The overall findings of this study support previous research conducted in nursing and medicine (Ferguson & Jinks, 1994; Corlett, 2000; Landers, 2000; Baxter, 2006), that students do perceive a theory-practice gap in athletic training education. To add to the depth and understanding of the students’ perception of a theory-practice gap in athletic training education, a synthesis of the suggestions found in the literature to address the findings is included in the discussion.
1. Undergraduate athletic training students do perceive a difference between what they are taught in the classroom versus what they experience in the clinical setting. No significant difference was found based on student experience level.

In other healthcare professions, the theory-practice gap is well acknowledged. As a result, much focus currently is on suggestions to minimize the theory-practice gap in healthcare education. Ferguson and Jinks (1994) and Corlett (2000) both suggested changing the sequence of didactic and clinical education to occur simultaneously. Many previous researchers also suggested using split appointments, faculty who practice and practitioners who teach, as a means to minimize the theory-practice gap (Ferguson & Jinks, 1994; Quinn, 1995; Hewison & Wildman, 1996). Lastly, using evidence-based practice has been suggested as a concept to decrease the differences found between the classroom and clinical settings (Upton, 1999). In theory, if we are teaching best practice in the classroom and in turn practicing best practice in the clinical setting, the gap between the classroom and clinic should be minimal.

The educational process of athletic trainers, knowing or unknowingly, utilizes the majority of methods suggested by other healthcare professions to minimize the presence of a theory-practice gap. Unique to athletic training education is the connectedness and timing of the educational components, didactic and clinical experiences. In athletic training education, didactic and clinical education occurs simultaneously, not concurrently. Most athletic training programs utilize dual positions and evidence-based practice is a component of the profession. Yet, data from this study suggests that a theory-practice gap is still perceived by the majority of athletic training students, 62.8%
of those completing the survey. The NATA Educational Competencies content areas where students perceived the greatest differences were Therapeutic Intervention, Clinical Examination and Diagnosis, and Evidence-Based Practice. In addition, there was no significance in the overall perception of a theory-practice gap based on the experience level of the student, consistent with the findings of Hislop, Cope, Stoddart and McIntosh (1996) and Corlett (2000). Thus, this research suggests that even if methods are in place to minimize the theory-practice gap, it still exists.

2. Although some students described negative emotional responses to the differences between the classroom and clinical settings, overall, athletic training students felt that the theory-practice gap had a positive impact on their learning, especially with their learning-over-time. Management strategies, especially asking for help, were similar for most respondents in this study.

Previous research conducted on how students’ react to the presence of a theory-practice gap has described their reaction as feeling left in the middle (Elkan & Robinson, 1993), feeling anxiety, apprehensive, worried and dubious (Cooke, 1996) and causing stress (Alexander & Haldane, 1979; Radcliffe & Lester, 2003). This current research study found that the minority of respondents, approximately 30%, stated in their open-ended responses, that the theory-practice gap created a negative impact. Respondents described similar emotions as previous research, i.e., stress, confusion, and frustration causing them to question their abilities and feel less motivated to study. McCaugherty (1991) stated that having students learn from a multitude of practitioners only adds to the
negative perception of a theory-practice gap. He stated that this exposure to first-hand variations of procedures is perceived as problematic and confusing.

Although students may perceive the theory-practice gap as negative at first, in contrast to the previous research mentioned above, data from this study suggests that 68% of students felt a theory-practice gap had a positive impact on their learning over time, causing them to learn things in a multitude of ways and reflect on what they learned in class. Thus, over time, participants were able to see the theory-practice gap as a positive learning opportunity. These findings are more consistent with the conclusions put forth by Rafferty et al. (1996), stating that the theory-practice gap tension should not be completely removed and that the differences between theory and practice are necessary for learning to take place.

A negative implication of a theory-practice gap that is consistent in both previous research and this study is the idea that there are two different kinds of knowledge present in healthcare curricula. Corlett (2000) refers to this issue adding to the gap because teachers emphasize performing skills in an ideal way, while practitioners place more emphasis on getting the skill completed realistically. Miller (1989) suggested that teachers value “know that” theoretical knowledge and practitioners value “know how” practical knowledge. Prince, Boshuizen, Van Der Vleuten, and Scherpbier (2005) surveyed medical students and found that over half agreed that clinical practice called for a different type of knowledge. These findings were confirmed in this study from numerous respondents. In the open-ended responses, several students in this study talked about information that they focus on for the class, for their examinations, and for the
Board of Certification (BOC) that is not part of their clinical experiences. “I feel like I memorize a bunch of stuff that isn’t practical to clinical use but since it’s going to be on the BOC I need to know it…”

Respondents in this study describe information needed to become an athletic trainer versus information needed to be an athletic trainer, thus the perception of a theory-practice gap continues in athletic training education. Dale (1994) stated that what is missing is a third type of knowledge, experiential knowledge, where students analyze the theoretical and practical knowledge through experience. Thus, perhaps athletic training education needs a method to better incorporate the two aspects of professional knowledge, content and practice.

3. Athletic training students were found to rely more heavily on the clinical setting information as well as using their preceptors as a source of knowledge.

Data from this study suggest students rely more heavily on information derived from the clinical aspects of athletic training education. This is consistent with previous studies conducted by Corlett (2000), which found that students gave more credence to what they saw and learned during clinical placements. Students in her study felt the classroom information and teachers were outdated. Previous research in athletic training conducted by Laurent and Weidner (2003) also supports Corlett (2000) as well as this current study, which found that students felt that more than half of their professional development came from their clinical education. Data from this research study found that in five of the eight NATA Educational Competencies content areas, respondents leaned towards clinical
setting information. Of the three content areas that remained, Evidence-Based Practice, Prevention and Health Promotion, and Healthcare Administration, respondents only slightly leaned towards the classroom information.

**Implications of Results**

We as professional athletic trainers, both as faculty and preceptors need to do a better job at explaining and helping our students understand the importance of seeing a variety of ways to practice athletic training. Although most students in this study were able to see the connection between the classroom and the clinical setting, 30% still felt the theory-practice gap had negative implications for their education. Thus, it is imperative for each of the 340 undergraduate athletic training education programs to evaluate if their own students fall into the 30% who struggle to see the benefits and in turn, make adjustments as needed to their individual programs. Our goal should not be to completely eliminate the theory-practice gap, but minimize the stresses that students perceive when a gap is present. We need to help students see that both entities, content and experience, are vital to building a strong foundation as a practicing athletic trainer. As one respondent stated, “I think they go hand in hand. Often the book taught method/answer helps you understand the clinical method/answer. So while you may not use the book method taught directly, it’s forming the base for what you are learning clinically.” After all, our goal, well-articulated by one of the survey respondents, is to produce practitioners who can “be more diverse and think critically about why” they chose their treatment plans.

As previously suggested by Manspeaker, Van Lunen, Turocy, Pribesh and Hankemeier (2011), athletic training education should integrate didactic information and
clinical application. One recommended option for helping minimize the theory-practice gap and assist students to work better within a theory-practice gap, while incorporating evidence-based practice, would be to utilize Pamela Baxter’s (2007) PALPATE approach to reflecting on practice. Students, along-side their preceptors and faculty could incorporate evidence into their patient care and have a method/process to evaluate the theory in practice. Using this approach, all stakeholders would benefit from the experience to understand the value of theory and practice.

**Recommendations for Future Research**

Minimal research on theory-practice gaps exists in athletic training education. Therefore, this study has opened the door for numerous future research areas. Although this study was conducted using a web-based survey tool, additional research would be beneficial utilizing a qualitative approach to further investigate students’ perception of the theory-practice gap, particularly, answering *why* students feel the gap exists. Not only would it be helpful to better understand the students’ perspectives, but further research should also be conducted involving all the stakeholders in athletic training education, namely faculty and preceptors and their perception of a theory-practice gap.

Athletic training education is slowly migrating to a master’s degree level. Currently, there are 25 Entry-level Master’s Athletic Training Education Programs in the United States. Further research should be conducted on Master’s level students’ perceptions of the theory-practice gap.

In addition, the educational competencies are constantly changing with athletic training education. Most recently, evidence-based practice has been added as the newest
component of the 5th Edition of the NATA Educational Competencies. Since evidence-based practice has often been recommended as a method to bridge the theory-practice gap, re-conducting the same student survey in a few years, once the new competencies have been implemented, could produce varying results.

Lastly, research utilizing the PALPATE method (Baxter, 2007) in select athletic training programs to minimize the theory-practice gap and incorporate evidence-based practice could produce findings to better understand the theory-practice gap. Once the method has been incorporated into a program’s curriculum, stakeholders’ perceptions of a theory-practice gap could be re-evaluated to see if changes occurred.

**Conclusion**

In conclusion, this study suggests that a theory-practice gap does exist in athletic training education, as it does in other allied health professions. The difference is that this gap, for the most part is seen as a positive entity, not a looming problem to be solved. As stated by several in previous research (Corlett, 2000; McCaugherty, 1991), theory and practice are complimentary to each other. “Theory without practice is sterile, practice without theory is blind” (McCaugherty, 1991, p. 1061). Corlett (2000) stated that theory is represented by the principles and knowledge needed to understand the *why* of practice.

To quote one of the study respondents, the difference between the classroom and clinical setting “actually has taught me to see the world through different viewpoints and caused me to think analytically and critically about WHY I do what I choose to do.” Thus, we are left with the 30% of students who struggle to make this connection. We as athletic training educators need to help our students understand that the classroom can
only present the average or general patient, while the clinical setting presents the student with the individuality and uniqueness of the actual patients. Both are a positive component to the educational process. Perhaps if we can help our students better understand the value of a theory-practice gap in athletic training education, we will produce better practitioners who can “think outside the book.”
REFERENCES


APPENDIX A

Qualtrics Web-Based Survey Questions

NOTE: Formatting within the online survey presents slightly differently to the participant.

Q1. Gender

☐ Male (1)
☐ Female (2)

Q2. What is your current age? (U.S. Census)

☐ 16 to 19 (1)
☐ 20 to 24 (2)
☐ 25 to 34 (3)
☐ 35 to 44 (4)
☐ 45 to 54 (5)
☐ 55 to 64 (6)
☐ 65 or over (7)

Q3. What NATA District do you attend school in?

☐ District 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont) (1)
☐ District 2 (Delaware, New Jersey, New York, Pennsylvania) (2)
☐ District 3 (District of Columbia, Maryland, North Carolina, South Carolina, Virginia, West Virginia) (3)
☐ District 4 (Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin) (4)
☐ District 5 (Iowa, Kansas, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota) (5)
☐ District 6 (Arkansas, Texas) (6)
☐ District 7 (Arizona, Colorado, New Mexico, Utah, Wyoming) (7)
☐ District 8 (California, Hawaii, Nevada) (8)
☐ District 9 (Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, Tennessee) (9)
☐ District 10 (Alaska, Idaho, Montana, Oregon, Washington) (10)
Q4. At what level does your institution primarily compete?

- NCAA Division I (1)
- NCAA Division II (2)
- NCAA Division III (3)
- NAIA (4)

Q5. How many years does it take to finish your Athletic Training Education Program once formally admitted?

- 2 years (1)
- 2.5 years (2)
- 3 years (3)
- 3.5 years (4)
- 4 years (5)

Q6. How many semesters of clinical experience have you completed?

- 0 Semesters (I am currently in my first semester) (1)
- 1 Semester Complete (2)
- 2 Semesters Complete (3)
- 3 Semesters Complete (4)
- 4 Semesters Complete (5)
- 5 Semesters Complete (6)
- 6 Semesters complete (7)
- 7 Semesters Complete (8)

Q7. Does your program have athletic trainers who primarily provide patient care and also teach in YOUR PROGRAM?

- Yes (1)
- No (2)
- Not Sure (3)

Answer If 7. Does your program have athletic trainers who primarily... Yes Is Selected
Q8. How many Athletic Trainers with the primary role of patient care in YOUR PROGRAM also teach at least one class in YOUR PROGRAM?

☐ One (1)
☐ Two (2)
☐ Three (3)
☐ Four (4)
☐ Five (5)
☐ Five or more (6)

Q9. Do you notice a difference between what you are taught in the classroom compared to what is used in your clinical experience/rotations?

☐ Yes (1)
☐ No (2)

Q10. Have you noticed a difference between the classroom and clinical experience/rotation in the following areas? (5th Edition NATA Educational Competencies)

<table>
<thead>
<tr>
<th>Area</th>
<th>Yes (1)</th>
<th>No (2)</th>
<th>Not sure (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence-Based Practice</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
</tr>
<tr>
<td>Prevention and Health Promotion</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
</tr>
<tr>
<td>Clinical Examination and Diagnosis</td>
<td>☐</td>
<td>☐</td>
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<td>Therapeutic Interventions</td>
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<tr>
<td>Professional Development and Responsibility</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
</tr>
<tr>
<td>Other Areas? Please explain</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
</tr>
</tbody>
</table>
Q11. How often do you notice a difference between what you are taught in the classroom and what is used in your clinical experiences/rotations?

_____ Frequency (1) (Slider scale)

Q12. What impact does this have on your learning experience?

_____ Impact (1) (Slider scale)

Q13. Currently, does a difference between the classroom and clinical experience/rotation have an impact on:

_____ You emotionally (1) (Slider scale)

Answer If 13. Currently, does a difference between the classroom an... You emotionally Is Greater Than or Equal to 25

Q14. In what way does the difference affect you emotionally? (Open-ended Response)

Q15. Currently, does a difference between the classroom and clinical experience/rotation have an impact on: (Slider Scales)

_____ Your learning of knowledge (1)
_____ Your learning of skills (2)
_____ Your performance of skills (3)
_____ Taking written/practical examinations (4)

Q16. When you notice a discrepancy, how do you handle it? What do you do? (Open-ended Response)
Q17. How has a difference between the classroom and clinical experience/rotation affected your learning over time or your development as a future athletic trainer? (Open-ended Response)

Q18. From which source do you most frequently lean towards for making decisions regarding the following areas: (5th Edition NATA Educational Competencies)

_____ Evidence-Based Practice (1)
_____ Prevention and Health Promotion (Risk Management/Nutrition) (2)
_____ Clinical Examination and Diagnosis (Orthopedic/Medical Conditions) (3)
_____ Acute Care of Injury and Illness (4)
_____ Therapeutic Interventions
   (Modalities/Conditioning/Rehabilitation/Pharmacology) (5)
_____ Psychosocial Strategies and Referral (6)
_____ Healthcare Administration (7)
_____ Professional Development and Responsibility (8)
_____ Other Areas? Please Explain (9)

Q19. With whom do you consult for information regarding the following areas: (5th Edition NATA Educational Competencies)

_____ Evidence-Based Practice (1)
_____ Prevention and Health Promotion (Risk Management/Nutrition) (2)
_____ Clinical Examination and Diagnosis (Orthopedic/Medical Conditions) (3)
_____ Acute Care of Injury and Illness (4)
_____ Therapeutic Interventions
   (Modalities/Conditioning/Rehabilitation/Pharmacology) (5)
_____ Psychosocial Strategies and Referral (6)
_____ Healthcare Administration (7)
_____ Professional Development and Responsibility (8)
_____ Other Areas? Please Explain (9)
APPENDIX B

Letters sent to Program Directors

Dear Program Director,

As program directors it seems like you are overwhelmed with research participation requests on a daily basis. This is another, but I feel it is worthy of your time. I am interested in furthering research on the **theory-practice gap in athletic training education**. The purpose of this study is to discover if students notice a difference between what is taught in the classroom and what is practiced during clinical experiences/rotations in athletic training education. Also, this study aims to discover how students respond to any disconnect.

This project has received IRB approval.

To assist me with the project, I am asking you to please forward the message below to all students currently enrolled in the professional/clinical phase of your athletic training education program. I sincerely appreciate your support with this project.

Thank you for your assistance,

Megan Streveler, MS, ATC, ATR

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Students’ Perception of a Theory-Practice Gap in Athletic Training Education

Dear athletic training student,

My name is Megan Streveler, MS, ATC and I am a doctoral student at the University of Minnesota Duluth. Under the supervision of Dr. Susan Damme, I am completing a research project to discover if students notice a difference between what is taught in the classroom and what is practiced during clinical experiences/rotations in athletic training education.

I would like to invite you to participate in this research study. If you decide to participate, the link below will take you to an online survey that should take approximately 15 minutes to complete. Your participation in this study is completely voluntary. Thank you for your time and consideration.

https://duluthedu.qualtrics.com/SE/?SID=SV_cFLDtMs7lq8XsK8

Megan
Follow-up letter to program directors:

Dear Program Director,

I wanted to take this time to remind you about the survey I sent on October 1st regarding your students’ perception about a theory-practice gap in athletic training education.

The purpose of this study is to discover if students notice a difference between what is taught in the classroom and what is practiced during clinical experiences/rotations in athletic training education. Also, this study aims to discover how students respond to any disconnect. This project has received IRB approval from the University of Minnesota.

To assist me with this project, I am asking you to do two things:

1. Please forward the message below and the survey link to all students currently enrolled in the professional/clinical phase of your athletic training education program.
2. If you did forward the survey in the past or are going to now, please send me a quick email (mstrevel@d.umn.edu) with the total number of students in your program.

Thank you for your assistance,
Megan Streveler, MS, ATC, ATR

Students’ Perception of a Theory-Practice Gap in Athletic Training Education

Dear athletic training student,

My name is Megan Streveler, MS, ATC, ATR and I am a doctoral student at the University of Minnesota Duluth. Under the supervision of Dr. Susan Damme, I am completing a research project to discover students’ viewpoints on what is being taught in the classroom setting compared to what is being used in the clinical experience settings.

I would like to invite you to participate in this research study. If you decide to participate, the link below will take you to an online survey that should take approximately 15 minutes to complete. Your participation in this study is completely voluntary.

Thank you for your time and consideration.
https://duluthedu.qualtrics.com/SE/?SID=SV_cFLDtMs7lq8XsK8

Megan
APPENDIX C

Consent Form

Students’ Perception of a Theory-Practice Gap in Athletic Training Education

The following consent form is from my online Qualtrics survey. Some of the questions are set to open only upon a certain response by the participant.

You are invited to be in a research study on students’ viewpoints on what is being taught in the classroom setting compared to what is being used in the clinical experience settings. You were selected as a possible participant because you are an undergraduate student enrolled in an accredited athletic training education program. Please read this form and ask any questions you may have before agreeing to be in the study.

This study is being conducted by: Megan Streveler, MS, ATC, ATR – Doctorate of Education student at the University of Minnesota Duluth. If you have any questions, please do not hesitate to contact me directly. (See contact info below)

**Background Information:**
The purpose of this study is: to discover if students notice a difference between what is taught in the classroom and what is practiced during clinical experiences/rotations in athletic training education. Also, this study aims to discover how students respond to any differences.

**Procedures:**
If you agree to participate in this study, please complete the attached survey which should take approximately 20 minutes.

**Risks and Benefits of being in the Study:**
- Risks: There are no risks to participating in this study.
- Benefit: There are no direct benefits to you other than knowing that your participation may have a benefit to improving the delivery of education in athletic training.

**Compensation:**
This study does not include any direct or indirect compensation.

**Confidentiality:**
The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a subject. Research records will be stored securely and only I will have access to the records. Research records including survey data will be stored on a password protected, encrypted site and only I, the principal researcher, will have access to the records.
Voluntary Nature of the Study:
Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota Duluth and its Athletic Training Education Program. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

Contacts and Questions:
The researcher conducting this study is: Megan Streveler. You may sign out of the survey and email or call me with your questions and resume the survey later. If you have questions later, you are encouraged to contact me at the University of Minnesota Duluth, 1216 Ordean Court, SpHC 102 Duluth MN 55812, (218) 726-8456, mstrevel@d.umn.edu. You may also contact my adviser Dr. Susan Damme at sdamme@d.umn.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, you are encouraged to contact the Research Subjects’ Advocate Line, D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; (612) 625-1650.
The IRB: Human Subjects Committee determined that the referenced study is exempt from review under federal guidelines 45 CFR Part 46.101(b) category #2 SURVEYS/INTERVIEWS; STANDARDIZED EDUCATIONAL TESTS; OBSERVATION OF PUBLIC BEHAVIOR.

**Study Number:** 1208E18345

**Principal Investigator:** Megan Streveler

**Title(s):**
Students’ Perception of a Theory-Practice Gap in Athletic Training Education