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*Old Dominion University*

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**Educational Practices and Attainment of Competency in the  
Professional Preparation of an Athletic Trainer**

By

Julie M. Cavallario

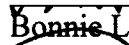
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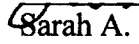
May, 2015

Approved by:

 \_\_\_\_\_  
Bonnie L. Van Lunen (Director)

 \_\_\_\_\_  
Johanna M. Hoch (Member)

 \_\_\_\_\_  
Matthew C. Hoch (Member)

 \_\_\_\_\_  
Sarah A. Manspeaker (Member)

# **ABSTRACT**

## **EDUCATIONAL PRACTICES AND ATTAINMENT OF COMPETENCY IN THE PROFESSIONAL PREPARATION OF AN ATHLETIC TRAINER**

Julie M. Cavallario  
Old Dominion University, 2015  
Director: Dr. Bonnie L. Van Lunen

The professional education of athletic trainers will continue to evolve as the needs of the profession, and the healthcare system, change. In current educational practices the educational preparation of an athletic trainer can take place at the undergraduate or post-baccalaureate level. Additionally, there are no universally applicable outcome measures for comparison of student performance in the clinical education portion of existing curriculums.

The purpose of this dissertation was to explore the existing education practices, especially relevant to clinical education, currently in place for athletic training (AT) at the professional level. The purpose of the literature review was to historically examine, in a qualitative content analysis, the accreditation Standards and their impact on the changing landscape of education of athletic trainers. The purposes of these studies were to examine current educational practices, both at the level of the degree, as well as in selection of clinical education experiences, to determine its impact on students and the profession, and to examine attainment and perception of competency by students, utilizing the Core Competencies, within clinical education in athletic training education.

The results of the qualitative content analysis suggest that the accreditation Standards reflect the goals and mission of the accrediting body at the time, and the

direction of AT education can be ascertained by examining such documents. In Project I it was determined that the potential transition of appropriate professional degree for athletic training could result in a loss of some AT programs, and may cause additional strain on faculty due to the loss of positions and graduate assistantships. This transition also could result in an increase of available positions for qualified personnel, and as post-baccalaureate programs perform better in universal outcome measures, could have a positive impact on the profession. In Project II it was evident that Clinical Education Coordinators (CECs) are influenced by the requirements of the accreditation Standards when selecting placements for their students. Additionally, CECs consider the best interests of the student, requests by the students, and challenges based on curricular structure or geographical location. Project IIIA determined that AT students are most likely to implement Core Competencies in experiences with a high patient volume, and when they are able to assist their Preceptor with patient encounters. Project IIIB conversely indicated that there are not changes in the perceived level of improvement in Core Competencies following an experience with high patient volume. Students do note greater perceived improvement in some Core Competencies with a more engaged role during patient encounters, and at certain clinical site types. The results of these studies expose the need for clinical education to be better evaluated, regardless of professional degree level, on the volume of patients and the role of the student during patient encounters, as opposed to the currently common practice method of evaluating clinical hours. Additionally the accreditation Standards should be written to encourage the incorporation of this type of outcome measure relative to clinical education.



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## LIST OF PUBLICATIONS

The following manuscripts support compilation of this dissertation:

Cavallario, JM, Van Lunen, BL. Preparation of the professional athletic trainer: A descriptive study of undergraduate and graduate degree programs. *Journal of Athletic Training*. Epub Ahead of Print.

Cavallario, JM, Van Lunen, BL, Manspeaker, SA. Experiences of clinical education coordinators in selecting clinical education experiences within the confines of the accreditation standard: A qualitative study. *Journal of Athletic Training*. In review: JAT 0121-15.

Cavallario, JM, Van Lunen BL, Hoch, JM, Hoch, MC, Manspeaker, SA. Evaluating athletic training student core competency implementation during patient encounters: A pilot study. To be submitted to *Journal of Athletic Training*.

Cavallario, JM, Van Lunen BL, Hoch, JM, Hoch, MC, Manspeaker, SA. Perceived improvement in level of core competency following a semester of tracking patient encounters: A pilot study. To be submitted to *Journal of Athletic Training*.

# CHAPTER I

## INTRODUCTION

### Background

The education of professional athletic trainers has greatly evolved since development of the first curriculum in the 1950s. Changes have been made to the vast majority of components of the educational model including the degree, requirements and qualifications of staff, and expectations and requirements of the clinical education component of the curriculum.<sup>1,2</sup> Over time the development of accreditation standards and the documented athletic training knowledge, skills, and abilities, has resulted in more clearly delineated guidelines for education programs to follow, and in some ways a more standardized educational format.<sup>3</sup>

During the early 1980s the Professional Education Committee led the charge to develop the requirements for an established major of Athletic Training (AT) in acknowledged programs. A survey conducted in 1982 of institution administrators resulted in a nearly unanimous opinion that few barriers existed that would impede the development of such a major.<sup>1</sup> A July, 1986 deadline was set for programs to adapt to the requirement of athletic training as a major otherwise schools would risk the withdrawal of the NATA approval of their programs. This deadline ultimately was extended until July, 1990<sup>1,4</sup> and coinciding with the decision to extend the deadline was the release of guidelines towards the development of an AT major's curriculum.<sup>1</sup> During this same period the first set of competencies in athletic training was developed, replacing the previous versions of behavioral objectives, and delineated performance domains of an athletic trainer. The transition to a major in AT inadvertently spurred the development of

the Bachelor's degree in Athletic Training, which was the entry-level degree of the profession at that time.<sup>1</sup>

AT education subsequently progressed through several different accrediting agencies, through which it continued to improve upon curricular standards, educational competencies, and clinical education requirements. In the early 1980s the NATA sought to begin accreditation of AT education by the American Medical Association's (AMA) Committee on Allied Health Education and Accreditation (CAHEA). This effort ultimately facilitated the recognition of AT as an allied health profession, but was not successful as far as achieving accreditation from an outside entity at that time.<sup>1</sup> In the early 1990s, following the allied health recognition, members of the NATA Professional Education Committee worked in conjunction with members of the CAHEA staff to form the Joint Review Committee on Education Programs in Athletic Training (JRC-AT). The JRC-AT formulated standards and guidelines for review and accreditation of entry-level programs and titled the document *Guidelines for Development and Implementation of NATA Approved Undergraduate Athletic Training Education Programs*.<sup>1,5</sup> This document was combined with the existing competencies and formatted into the CAHEA acceptable format, resulting in the *Essentials and Guidelines for an Accredited Education Program for the Athletic Trainer*.<sup>1,6</sup> In the mid-1990s CAHEA disbanded under the direction of the AMA, and the Commission on Accreditation of Allied Health Education Programs (CAAHEP) was formed. This transition was seamless and primarily continued the use of the existing governing documents. During this time the NATA Board of Directors and Board of Certification (BOC) approved policies that required that graduate AT education must be advanced as compared to the undergraduate, professional level

education, and that graduate level education could not be considered a route to certification. It was established during this time period that the professional entry-level degree was an undergraduate degree from a CAAHEP accredited institution and that NATA approved graduate degree programs were for advanced knowledge.<sup>1</sup> However, students were still eligible to sit for the NATABOC examination if they graduated from an internship program and accumulated a minimum of 1500 clinical experience hours. In 1996, the NATA Education Task Force released recommendations to the NATA Board of Directors that recommended the removal of the internship route to certification, solidifying the need and importance of an accredited AT curriculum in the development and education of AT students. This recommendation was fully implemented by 2004.<sup>1,7-9</sup> Additional recommendations made at this time included supporting the possibility of entry-level education provided at the graduate level, increasing the education and training of clinical education instructors, examining the requirements related to clinical education, and developing an educational committee.<sup>1,7,8</sup>

Following the phasing out of the internship route to certification the JRC-AT component of CAAHEP disbanded to form the Commission for Accreditation of Athletic Training Education (CAATE) in 2006.<sup>10</sup> The CAATE reviewed and revised the existing accreditation standards that the CAAHEP had approved and implemented in 2001. The CAATE released the most recent version of accreditation standards in 2012.

Most recently the National Athletic Trainers Association (NATA) Executive Committee for Education (ECE) released a *Future Directions in Athletic Training* document that outlined some areas of interest to be pursued for the betterment of AT education.<sup>7</sup> Some of the suggestions within that document included the examination of

the ideal professional degree for athletic trainers, examination of areas in which support can be given to AT students that are attempting to transition to practice, and also seeking out areas of research that provide support to educational practices that correspond with patient outcomes.<sup>7</sup>

### Degree Preparation

Changes in the needs of the Nation's health care system have resulted in a demand for increased training for health care professionals. Within AT there are potential benefits and consequences that are associated with a proposed degree change. Oftentimes the profession of AT is compared to other health care professions such as nursing, physician assistants (PA), and physical therapists (PT) with regard to their levels of professional preparation. These professions have similarities and differences within their educational preparation that may be useful in shedding insight into how educational preparation may impact the practice of health care professions.

The professional education of nursing is perhaps the most varied of the health care providers. Over the last century the shift of nursing education for Registered Nurses (RN) from diploma to degree programs has had a significant impact on the profession. Currently Registered Nurses can obtain degrees at the Associate, Baccalaureate, or the Master degree levels. The majority of current nursing students are enrolled at the Associate degree level, which takes two years to complete.<sup>11</sup> This multi-entry-level practice is viewed to have limited the nursing profession as a whole by undermining the understanding of the public and peers of the required level of training of RN's.<sup>12</sup> Upon the completion of initial nursing education RN's have the option to enter into advanced practice nursing programs. These programs vary in length and coursework and include

options such as Nurse Practitioners (NP), clinical nurse specialists, nurse midwives, or nurse anesthetists. The most common of these specialties is NP.<sup>11</sup> Education for NPs was initially a post-baccalaureate certificate program, but as of the 1970's has transitioned to a Master's degree preparation. To enter into an NP program, RN's must have completed a baccalaureate nursing education program with required coursework as well as the required 700 associated clinical hours. RN's must then complete 2,000-4,000 clinical RN experience hours before acceptance in NP programs. Upon entrance into an NP program the candidates must select a specialty area (i.e., family, acute care, women's health). Following completion of coursework, a minimum of 500 clinical NP hours are required prior to graduation.<sup>13</sup> Nursing programs, both for RN licensure and the advanced practice certificate, are monitored by the American Association of Colleges of Nursing (AACN).

Of the comparable health care professions mentioned, PA education most closely models physician education and training, but is also extremely varied in its entry-level educational level. Launched in the 1960's in an effort to compensate for a shortage of physicians, PA education rapidly evolved to incorporate competency based education with accreditation standards and guidelines.<sup>13</sup> The majority of change within the competencies for education of PAs has been guided by need in clinical practice to provide care equivalent to the care that physicians provide.<sup>14</sup> Physician Assistant education has no required pre-requisite degree, however more than three quarters of physician assistant education programs are offered at the Master's degree level, thus requiring a baccalaureate preparation prior to entry. Other programs are offered at the baccalaureate, associate, and certificate levels, but all programs do have requisite criteria

prior to entrance.<sup>13,14</sup> This criterion includes approximately two years of undergraduate coursework focused primarily in health and medical related sciences as well as one to four years of health related work experience. After completion of the didactic portion of the education program PA students are required to complete at least one year of full-time clinical practice, or the equivalent of 2,000 hours, under the supervision of a physician. PA students must pass a national certification exam upon graduation, and renew this certification by re-taking the national exam every six years, in addition to maintaining continuing education units. Competencies, standards, and accreditation for PA Education are maintained by the American Association of Physician Assistants (AAPA).<sup>13</sup>

Physical Therapist education and training began in the late 1800's, but largely emerged during World War I with a need for rehabilitation programs for injured war veterans. The profession evolved over the 20<sup>th</sup> century to become a competency based, domain oriented, accredited educational system. In the early 2000's the majority of programs required students to complete a baccalaureate degree before entry into professional level coursework. As of 2007 the transition to an entry-level clinical doctoral degree requirement was underway. The reason for this change was cited as the need to prepare graduates at a level consistent with other autonomous practitioners such as Medical Doctors, Dentists, and Pharmacists.<sup>15</sup> In addition to completion of mandatory coursework, PT education programs require clinical hours as part of the curriculum. Clinical hours are completed under the supervision of a licensed, practicing physical therapist. The average number of clinical hours completed by full-time PT students in 2011-2012 was 1431, but ranged from 920-2160.<sup>16</sup> Graduates of programs also must pass a national board certification exam, as well as maintain continuing education units.

Physical Therapy competencies, standards, and accreditation are regulated by the Commission on Accreditation of Physical Therapy Education (CAPTE).<sup>15</sup>

As previously discussed, AT education was developed in the 1950's and was largely dependent on curriculum and resources for PT programs. In fact, AT students were commonly encouraged to pursue additional education as physical therapists upon completion of their athletic training coursework.<sup>1</sup> Currently, AT is a competency based education program that includes both clinical and didactic elements. This education can occur at the baccalaureate or post-baccalaureate level, both resulting in eligibility to attempt the board of certification (BOC) examination.<sup>1</sup>

Despite some similarities in educational training RN's, NP's, PAs, physical therapists, and athletic trainers all have varying legal capabilities regarding autonomous practice. The most restricted of these are RN's. This is expected as RN's are required to have the least amount of mandatory education prior to entry into the field of any of these professions. RN's are not permitted to treat patients autonomously; and patient care takes place only with the supervision and instructions of a treating physician.<sup>12</sup> NP's however, due to the advanced training that they receive, are allowed to practice independently in more than 50% of the states in the U.S.<sup>13</sup> More than a quarter of states require a collaborative agreement between the NP and physician, and less than a quarter of states require NP's to have physician supervision.<sup>13</sup> Both PAs and athletic trainers are required to practice under the supervision of a licensed physician. Supervision may include contact through phone, email, pager, and direct physical presence.<sup>13</sup> Lastly, physical therapists, who have the highest amount of entry-level education, also have the highest



amount of autonomy with direct patient access and no required physician referral for patients in order for them to receive reimbursement.<sup>15</sup>

Due to the ever-changing face of health care, practitioners are expected to not only maintain those initial skills and competencies taught in their entry-level education, but are expected to stay current with treatment updates and evidence-based practice trends. Ultimately, the body of knowledge for health care practitioners has only increased since their inception. This increased body of knowledge has resulted in recommendations for certain health care educational programs to increase their entry-level education requirements.

Registered Nurses can currently enter the profession with an Associate's degree, which is the lowest level of education required for any licensed health care provider, and subsequently there is a lack of respect for the profession both from patients and peers.<sup>12</sup> Additionally there is a nursing shortage in the United States, and because of this shortage nurses have greater demands placed upon them in terms of patient load, work scheduling, and in professional expectations.<sup>11</sup> This lack of advanced education has also led to a shortage in nursing educators as well.<sup>12</sup> Due to these reasons there has been a recent push for the entry-level degree requirement for RN's to be a baccalaureate level degree, with the addition of a Clinical Doctorate to the profession as well. The American Nursing Association (ANA) had made the recommendation for mandatory baccalaureate level education for entry into the nursing profession based on the precedents set by several states that have already made this requirement at the state licensure level. Additionally, the ANA recommends the consideration to implement mandatory Master's degree completion within 10 years of obtaining initial licensure. This transition is supported by

research that demonstrates that in hospital employment settings the higher the level of education of the nursing staff the lower the mortality rate.<sup>12</sup>

In addition to the advancement of the entry-level nursing degree, there is a consideration to also develop and implement a more structured Doctor of Nursing Practice (DNP) degree. This degree would most likely become the required degree for NP's if indeed RN's are required to receive a Master's level education.<sup>13,17</sup> The DNP degree does currently exist with the goal of increasing those skills in nurses that employers have cited a need for, such as problem solving and critical thinking in patient care. It is with these goals in mind that institutions offering the DNP build upon basic entry-level skill and education. The DNP programs include three years of post-baccalaureate study, or one to two years post-Master's level study. The majority of current programs intend for the final year of study to be a total immersion residency to obtain clinical hours of practice. The goal of the DNP degree implementation is to create a practitioner who provides care autonomously at a level similar to clinical doctorate counterparts.<sup>17</sup> This evolution of nursing education is relative to its comparable healthcare professions, including AT. The goals of basic and advanced education for nursing are for the most part mirrored in the goals of athletic training. The strategic alliance (Board of Certification (BOC), CAATE, and the NATA) within AT is evaluating which degree level of professional education best prepares the athletic trainer for autonomous clinical practice with improved patient outcomes, which are the same reason for ANA recommendations for nursing education. Also similar to post-professional nursing education, post-professional education in AT is intended to provide athletic trainers increased focus beyond the entry-level educational standards in conjunction with

advanced supervised clinical practice. By comparing AT education with nursing education it is possible to glean that the goals of each profession are mirrored in the drive for improvement in the educational requirements.

There are definitive challenges that the DNP faces before becoming a widespread accepted professional degree.<sup>17</sup> The first of these is the lack of clear-cut entry-level degree. Currently students are becoming RN's with Associate, Baccalaureate and Master's degrees. This creates a varied knowledge base for students all attempting to potentially complete this terminal practice degree. Until nursing establishes a set entry level degree it will be difficult to regulate DNP curriculum and to define "advanced" educational standards.<sup>17</sup> This could be seen as an obstacle that AT faces as well, since there are currently two potential entry-level degrees in existence. It could be argued that those that graduate from an entry-level Master's program have the potential to have a much more varied background in the science and liberal arts however, the existence of established minimum professional competencies is likely to make the professional AT entering into the profession, regardless of degree level, comparable. Another challenge that nursing faces is that currently the majority of employers do not differentiate in either job description or pay scale, based on educational levels of nurses who are hired.<sup>17</sup> This results in nurses who lack financial motivation to seek out further education.<sup>17</sup> This challenge also exists within AT, with the idea that if a Post-baccalaureate degree is required this will result in increased financial demands placed on students, with no evidence that the additional required education will result in increased salary allotments.<sup>7,18</sup>

Athletic training currently has almost as many post-professional education options as nursing does entry-level options. Following completion of an entry-level degree and certification, graduates have the option to entry into clinical practice, to begin a post-professional Master's level education, some of which are accredited through the CAATE, or to complete an accredited residency program. Perceptions of employers indicate that entry level graduates are lacking in organization and administration abilities, as well as interpersonal and communication skills.<sup>19</sup> The majority of these employers indicated that these abilities are best learned clinically, not instructionally. Perceptions of graduates of these programs also indicated a lack of confidence as another weakness that professional graduates possess.<sup>19</sup> Athletic trainers typically pursue advanced degree options, either post-professional AT or other related programs. Currently 6% of entry-level graduates matriculate into CAATE accredited post-professional AT programs.<sup>20</sup> The majority of these students report being satisfied with all aspects of the educational curriculum.<sup>20,21</sup> Many of the remaining entry-level graduates seek experience and education at either non-accredited programs or residency programs.

Athletic training as a health care profession is on the precipice of potential change. Recent recommendation from the NATA Executive Committee for Education suggests research into what the true entry-level degree for the profession should be.<sup>7</sup> As a result of this charge a White Paper titled "Professional Education in Athletic Training; An Examination of the Professional Degree Level" was produced by a working group appointed by the committee.<sup>22</sup> This group examined existing evidence to make a recommendation regarding the needs for the entry-level degree in AT. The resulting recommendation demonstrated that the potential benefits of adjusting the entry-level

degree to a Master's degree for athletic trainers would outweigh the potential consequences the profession may face as a result. Some of the reasons behind this recommendation were that if this transition were to occur there would be better alignment with peer health profession education resulting in greater inter-professional collaboration, and that programs would have higher retention rates and potentially better outcome measures when able to educate more mature, well-rounded students.<sup>22</sup> As of yet none of the strategic alliance has publicly addressed this document regarding its contents, nor their consideration of them. The PT profession has already shifted to accept the DPT degree as the entry-level degree. This began as part of the APTA Vision 2020 statement and educational strategic plan as an attempt to bring physical therapy into a more autonomous practice. An alternative goal of this strategy was that this transition might bring about the change in insurance companies requiring physician referral for reimbursement for care.<sup>15</sup> However, there are those who felt that this change would have little effect on the external view of the profession from other health care professionals, but would instead have a more significant impact internally on the profession by increasing the maturity and professionalism of graduates.<sup>23</sup> It has also been identified that the profession of PT was not able to address all of the anecdotal potential concerns and consequences of transitioning the entry-level degree prior to its implementation.<sup>24</sup> This process of events would appear to be mirrored in the dilemma facing athletic training education today. There are plenty of anecdotal potential benefits and consequences of transitioning the entry-level degree for athletic training, very few of which have been addressed within the research to date.<sup>18,22,25</sup>

There are obvious similarities and divergences in the current educational practices of each of these peer health care professions with regard to AT education. However, there are similar trends in the educational direction of each of these as well. There is a desire amongst practitioners, specifically in athletic training, to gain status and respect from their professional peers, to produce better students that can transition to practice effectively, as well as to further demonstrate the ability of the professional athletic trainer to practice in an autonomous fashion. Further research is needed to demonstrate the role that the entry-level degree may play in achieving these goals.

### Clinical Education

While the degree athletic trainers obtain is a large component of their education, there are other components that significantly contribute to their preparation to transition to professional practice, and clinical education is one of these. During the educational development of athletic training curriculum in the 1970s the NATA Professional Education Committee developed and released a list of behavioral objectives that characterized learning outcomes for students, a minimum clinical hour requirement, and skill-competency checklist.<sup>1,2</sup> The first edition of the Competencies in Athletic Training was developed in 1983, and these were based on performance domains of the athletic trainer. From the late 1970s until the end of the 20<sup>th</sup> century AT students could be eligible for certification after having either graduated from an accredited institution with an approved curriculum and an accumulated clinical hour experience of 600-800 hours, or graduate from an apprenticeship/internship program that did not follow approved curriculum, but accumulated at least 1500 hours of clinical experience.<sup>1,2</sup> The dichotomy

in routes to entry into the profession demonstrates the significance of knowledge gained during the clinical experience portion of the education of an AT student.

More recently, following the removal of the internship route to certification, clinical education has become more formal and structured with intended experiences and formal evaluation. Other than the obvious concern for patient safety, one of the driving components of this reform had been the concept and theory of professional socialization.<sup>2</sup> Professional socialization comprises the concept in which a person is accepted into a tradition, and subsequently acquires that groups' traditional values, attitudes, and skills. Early professional socialization in theory would be beneficial, however there are times in which AT students have reported feeling more like a provisional work force, than students within an educational setting.<sup>2,26</sup> The increased structure and guidelines provided within the more recent versions of the accreditation standards regarding how clinical education is formatted and implemented ensure that professional socialization occurs, but not at the expense of the students' educational experience.<sup>2,3</sup>

The preceptor fulfills a monumental role in the clinical experience of an AT student, and has been identified as one of the most critical and significant components.<sup>2,27-32</sup> The preceptor, formally referred to within AT education as an approved clinical instructor or clinical instructor, supervises a student's clinical development, provides feedback, evaluates their performance within their assigned clinical experience, and is responsible for implementing appropriate professional socialization.<sup>2,27-33</sup> Current educational accreditation standards primarily designate the Clinical Education Coordinator (CEC) as the program official responsible for the selection and education of preceptors, and the assignments of students from their program

to those preceptors for their clinical education experience.<sup>3</sup> There are also accreditation standards that indicate a minimum level of requirement regarding types of experiences that a student must receive under the supervision of those preceptors. While the CEC has some level of autonomy regarding which students will be placed with certain preceptors; there are still experiences that the student must receive.<sup>3</sup> Although it has been demonstrated within the research that a preceptor is the primary contributor to a successful clinical education experience in the eyes of the student,<sup>27</sup> it is likely that it cannot be the primary consideration when placing the student.

Students' clinical experiences have many components that contribute to their development as practicing professionals. Often the experience is selected based on the type or setting of the experience, or the preceptor available for the experience, however, there may be additional factors that should be considered as they impact patient outcomes and professional development.<sup>30</sup> There has been discussion amongst professionals as to the effect of clinical education on patient outcomes.<sup>7,18,22,25</sup> One of the components of clinical education in AT is the patient encounter. There is variety in the frequency and type of patient encounters within each clinical education experience. While research exists that demonstrates that early and frequent patient contacts benefit the educational experience of students in other health care professions,<sup>34-36</sup> there is little examination on this topic within the field of athletic training.<sup>37</sup> More research is needed to evaluate how frequency and type of patient encounter impacts the preparation of the professional AT student.



### Core Competencies

In March of 2001 the Institute of Medicine (IOM) released a report titled “*Crossing the Quality Chasm: A New Health System for the 21<sup>st</sup> Century*” that called for an overhaul of the current health care system that would ideally result in improved patient outcomes.<sup>38</sup> In order to effect this change on the healthcare system the IOM outlined concepts that idyllically would change the environment in which health care is delivered that should be adopted by all health care practitioners.<sup>38</sup> While there were a multitude of aims addressed in this report, the Pew Health Professions Commission released additional reports that narrowed the list down to 5 aims that are the most relevant across the disciplines of health care provisions.<sup>39</sup>

The first of these concepts is to apply evidence to health care delivery. At the time of publication new knowledge generated by scientific inquiry and discovery was taking an average of 17 years to be incorporated into practice at a minimum level. In order to improve patient outcomes evidence should be evaluated and synthesized with clinical applicability in mind, and tools should be made available to clinicians and patients to support the use of current evidence in care and clinical decision making.<sup>38</sup> This concept has evolved into the current competency known as evidence-based practice which encourages education of clinicians to critically appraise and incorporate applicable research findings into clinical practice, as well as to participate in research opportunities and disseminate findings if possible.<sup>40</sup>

The second concept the IOM report encourages is the use of information technology. The use of information technology, such as electronic medical records, can result in a more organized practice with fewer patient care errors due to gaps in medical

information.<sup>38</sup> Incorporating information technology can increase the ease with which practitioners access research and knowledge needed to implement evidence-based practice. Ultimately this concept should eliminate practice of handwritten clinical data.<sup>38</sup> This competency results in the communication, documentation, and knowledge management through the use of information technology, and is referred to as Use of Healthcare Informatics.<sup>40</sup>

The third call to action from the *Quality Chasm* report is to align payment policies with quality improvement. If payment policies are examined and altered to allow for equal incentive for caring for all types of patients then providers would be better able to improve the care that all patients receive. Quality care should not be dependent on the types of insurance a patient has, or the ability of the patient to pay for said care.<sup>38</sup> This has progressed to the current competency of Quality Improvement which implores providers to identify trends and concerns in care by measuring patient outcomes and population needs, to address those concerns with evidence-based interventions and examining the resulting outcomes to determine efficacy of the intervention.<sup>40</sup>

The fourth concept addressed by the *Quality Chasm* is preparation of the work force. Training of health care providers to operate within an updated system is imperative to the improvement of patient care. This involves health care providers incorporating the aforementioned concepts, but also encompasses the need for providers to recognize the strength and weakness of all members of the patient care team.<sup>38</sup> Preparation of the workforce now comprises the competency of Interprofessional Education and Collaborative Practice. The goal for interprofessional collaboration beseeches providers to cooperate and integrate care in teams to provide better quality care for patients.<sup>40</sup>

The overarching theme of these concepts supplies the final aim of the *Quality Chasm* which is to provide patient centered care.<sup>38</sup> The Patient Centered Care competency calls for all providers to not only recognize, but respect and care about, the difference between patients and their values. Providers should encourage and advocate for their patients to have a voice in their treatment needs and desired outcomes.<sup>40</sup>

The Accreditation Council for Graduate Medical Education (ACGME) subsequently examined the education of medical residents and determined that residents were not prepared to practice in a healthcare environment that incorporated the IOM's recommendations. A release of new accreditation standards in 2006 identified six core areas of competency in which all trained physicians needed to be able to demonstrate proficient implementation. These included the five previously addressed competencies and introduced the sixth competency of Professionalism. In addition to exhibiting ethical behavior expected of a medical professional, professionalism incorporates the need for practitioners to participate in the efforts of professional organizations.<sup>41</sup>

Since the inception of these competencies health care professions have demonstrated an attempt to incorporate the core competencies into the educational curriculum of newly trained providers. Athletic Training specifically has incorporated the Core Competencies into the accreditation standards for post-professional AT programs and residency AT programs.<sup>42,43</sup> However, other health professions, specifically nursing, have postulated that earlier introduction of the Core Competencies into the educational curriculum for their students results might increase the student understanding Core Competencies.<sup>44,45</sup>

To date there are no requirements for the Core Competencies to be included in the professional level education for athletic trainers.<sup>3</sup> As many graduating professional athletic trainers transition directly to practice without attending post-professional education programs that incorporate the Core Competencies, it is necessary to consider and examine the feasibility of incorporating the Core Competencies into professional education. Along those same lines, it is necessary to examine the ability of students to demonstrate the opportunity to implement those competencies in their clinical education environment in order to determine proficiency in these skills that will be necessary components of their professional practice.

### The Problem

Determining better ways to prepare AT students for transition to practice is an ongoing process that all professional educational programs face. The NATA ECE working group White Paper has brought to the forefront the need to examine the appropriate professional entry-level degree.<sup>22</sup> There is anecdotal evidence that has been expressed both in support of and in opposition to this potential transition.<sup>18,25</sup> More research is needed to examine the impacts of entry-level degree transition to students, programs, and the profession as a whole.

Clinical education is a large component of an athletic training program.<sup>2</sup> Clinical education placements are most often determined by the CEC under the requirements detailed in the accreditation standards.<sup>3</sup> The accreditation standards should facilitate placement of students by the CEC based on which experience will best enhance the students' educational experience and knowledge base. Clinical education should also be evaluated to determine that the goals set for the experience are being obtained. As early,

and frequent, patient encounters have been identified as crucial educational components in the programs of peer health professions,<sup>34-36</sup> it is possible that the same would apply within AT education. It is the recommendation that the Core Competencies be integrated into the professional preparation of health care providers.<sup>38,39</sup> This has also been the recommendation for the AT education,<sup>40</sup> but to date no research has examined how to evaluate these Competencies in the clinical education realm. Examination of how patient encounters impact clinical education experiences, specifically relative to Core Competency implementation, may potentially affect the process by which clinical education is approached and evaluated within AT programs.

### Purposes

There were five purposes of this dissertation. The first purpose was to perform a quality content analysis of the last four editions of accreditation standards that have guided the development of entry-level AT education curriculum to determine areas of focus, themes of education reflected within the standards during each historical period of time, as well as to assist in the explanation of the evolution of AT education as it has been impacted by the standards. The second purpose was to obtain descriptive information from professional AT programs as it relates to the proposed professional degree transition. The third purpose was to explore the processes that CECs employ to place students in clinical education experiences, and the reasons that those methods are utilized. The fourth purpose was to examine the impact of the length and frequency of patient encounters by AT students, as well as the site and role of the student in those patient encounters, on implementation of the Core Competencies during their clinical education experience. The fifth purpose was to examine the impact of the length and

frequency of patient encounters by AT students, as well as the site and role of the student in those patient encounters on the students' overall perceived levels of competency in each of the Core Competency areas. These studies were designed to address the following aims:

1. To qualitatively analyze accreditation standard content to determine if it reflects:
  - a. the goals and mission of the athletic training accrediting body of the time.
  - b. the period of time in which the standards were in place.
  - c. the overall direction of education during the time in which each individual set of standards was utilized.
2. To collect descriptive data for professional athletic training programs in order to:
  - a. demonstrate potential benefits and consequences of the proposed degree change.
  - b. compare baccalaureate and post-baccalaureate professional programs with regard to program performance in universal outcome measures.
3. To explore the perception and experiences of CECs as they assign students in clinical education placements within the confines of the accreditation standards.
4. To determine to what extent implementation of the Core Competencies, as a whole and individually is related to:
  - a. the frequency of patient encounters for a student.

- b. the length of patient encounters for a student.
  - c. the role of the student during each patient encounter.
  - d. the clinical site of the student during each patient encounter.
5. To determine to what extent the students' perceived level of improvement in each of the individual Core Competencies is related to:
- a. the frequency of patient encounters for a student.
  - b. the length of patient encounters for a student.
  - c. the role of the student during each patient encounter.
  - d. the clinical site of the student during each patient encounter.

### Hypotheses

Hypothesis for Aim 1A: The goals and respective missions of the accrediting agency will be apparent within their associated set of standards.

Hypothesis for Aim 1B: The accreditation standards will reflect the historical time period in which the standards were in use.

Hypothesis for Aim 1C: The overall direction and focus of education will be evident within the set of accreditation standards in use for each time period.

Hypothesis for Aim 2A: The descriptive data for professional education programs will confirm some of the potential benefits and consequences of a degree transition.

Hypothesis for Aim 2B: Post-baccalaureate professional athletic training programs will perform better in the existing universal outcome measures.

Hypothesis for Aim 3: Clinical Education Coordinators will report placing students in clinical education experiences based on the accreditation standard as the primary consideration.

Hypothesis for Aim 4A: An increased frequency of patient encounters will result in increased Core Competency implementation by athletic training students.

Hypothesis for Aim 4B: Patient encounters that result in a greater amount of time spent with the patient will result in increased Core Competency implementation by athletic training students.

Hypothesis for Aim 4C: Students who are able to assume a role with greater autonomy will have increased Core Competency implementation.

Hypothesis for Aim 4D: Students at different Clinical Education sites will have increased opportunities to implement the Core Competencies.

Hypothesis for Aim 5A: An increased frequency of patient encounters will result in greater perceived level of improvement in the Core Competencies by athletic training students.

Hypothesis for Aim 5B: Patient encounters that result in greater amount of time spent with the patient will result in greater perceived level of improvement in the Core Competencies by athletic training students.

Hypothesis for Aim 5C: Students who are able to assume a role with greater autonomy will have a greater perceived level of improvement in the Core Competencies.

Hypothesis for Aim 5D: Students at different Clinical Education sites will have increased perceived level of improvement in the Core Competencies.



### Overview

The methods, results, discussions, limitations, and conclusions of the four aforementioned aims are presented in the following sequence: Chapter 2 analyzes the content of the four sets of accreditation standards used within AT since the 1990s, Chapter 3 summarizes the comparison and analysis of descriptive information as it relates to professional programs and the proposed professional degree transition, Chapter 4 summarizes the perceptions and methods of CECs as they place students within their clinical education experience, and Chapter 5 summarizes how Core Competency implementation is related to frequency and length of patient encounters and student role and clinical site during patient encounters. Chapter 6 summarizes how perceived improvement in the Core Competencies is related to frequency and length of patient encounters and student role and clinical site during patient encounters. To conclude, Chapter 7 summarizes the findings of each of these studies and discusses future research implications.

### Operational Definitions

Clinical Education - The application of athletic training knowledge, skills, and clinical abilities on an actual patient base that is evaluated and feedback is provided by a preceptor.<sup>3</sup>

Clinical Education Coordinator – Athletic training program official responsible for ensuring the following components of clinical education: student clinical progression, clinical site evaluation, preceptor training, and preceptor evaluation.<sup>3</sup>

Clinical Site – A physical area where clinical education occurs.<sup>3</sup>

Degree – The award conferred by the college or university that indicates the level of education (baccalaureate or masters) that the student has successfully completed in athletic training.<sup>3</sup>

Metric – An athletic training program’s assessment measures.<sup>3</sup>

Outcome Assessment Instrument - A collection of documents used to measure the program’s progress towards meeting its published outcomes. Examples of outcomes assessment instruments include course evaluation forms, employer surveys, alumni surveys, student evaluation forms, preceptor evaluation forms, and so on.<sup>3</sup>

Patient Encounter – An interaction with a patient in need of services that an athletic training student participates in.

Preceptor – A certified/licensed professional who teaches and evaluates students in a clinical setting using an actual patient base.<sup>3</sup>

Program Director – The full-time faculty member of the host institution and BOC Certified Athletic Trainer responsible for the implementation, delivery, and administration of the AT Program.<sup>3</sup>

Universal Outcome Measure – A metric that is utilized across all professional athletic training programs; BOC exam passing rates, graduation rates, and employment rates.

### Assumptions

For the purposes of this dissertation it will be assumed that:

#### **For Chapter 3:**

1. Participants were the Program Director at their respective institutions.
2. Participants read and understood each question when providing their answer.

3. Participants provided the most up to date information and did not estimate items that required a numerical input (i.e. institution size, tuition, etc.)
4. Participants provided honest answers on all survey questions.

**For Chapter 4:**

1. Participants answered questions honestly.

**For Chapter 5:**

1. Participants listened to, and referenced, the provided educational tools for Core Competency comprehension and examples.
2. Participants logged all information honestly within the software program.
3. The Program Director submitted all reports to the Investigator.
4. The participants understood the Core Competency survey statements.
5. The participants answered the surveys honestly.
6. The participants were able to differentiate between their actions and those of their preceptor.
7. The participants reported information that they actually completed

**For Chapter 6:**

1. Participants listened to, and referenced, the provided educational tools for Core Competency comprehension and examples.
2. Participants logged all information honestly within the software program.
3. The Program Director submitted all reports to the Investigator.
4. The participants understood the Core Competency survey statements.
5. The participants answered the surveys honestly.

6. The participants were able to differentiate between their actions and those of their preceptor.
7. The participants reported information that they actually completed.

### Delimitations

#### **For Chapter 3:**

1. Participants were Program Directors within a professional athletic training program.
2. Participants had to complete the entire survey for answers to be included in the results.

#### **For Chapter 4:**

1. Participants were Clinical Education Coordinators at Post-baccalaureate professional athletic training programs.
2. Participants have held the Clinical Education Coordinator position for a minimum total of three years.
3. A semi-structured interview process will be utilized, therefore follow-up questions may differ between participants.
4. The researcher approached this study with a social-constructivist paradigm acknowledging the role of the researcher's bias within the findings.

#### **For Chapter 5:**

1. Participating programs already utilized the EValue software program.
2. Participating programs already minimally required students to track:
  - a. the number of patient encounters the student had each day.
  - b. the type of patient encounters the student had each day.

- c. the level of supervision the student had for each patient encounter.
  - d. the clinical site at which each encounter occurred
- 3. Participating programs agreed to embed the six question block of professional core competency follow-up questions on the patient contact reporting page for each student.
- 4. Participants received an informational program, prior to participating, to ensure a baseline level of Core Competency information was provided.

**For Chapter 6:**

- 1. Participating programs already utilized the EValue software program.
- 2. Participating programs already minimally required students to track:
  - a. the number of patient encounters the student had each day.
  - b. the type of patient encounters the student had each day.
  - c. the level of supervision the student had for each patient encounter.
  - d. the clinical site at which each patient encounter occurred
- 3. Participants received an information program, prior to participating, to ensure a baseline level of Core Competency information was provided.

Limitations

**For Chapter 3:**

- 1. Survey question order was not randomized.

**For Chapter 4:**

- 1. Interviews were conducted over the phone.

**For Chapter 5:**

1. Data was not directly submitted to the researcher.
2. Only one program currently utilizing EValue was included.

**For Chapter 6:**

1. Data was not directly submitted to the researcher.
2. Only one program currently utilizing EValue was included.

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## CHAPTER II

### **Qualitative Content Analysis of Athletic Training Education Accreditation Standards**

#### Introduction

In the early 1990s, following the allied health recognition of athletic trainers, members of the NATA Professional Education Committee worked in conjunction with members of the CAHEA staff to form the Joint Review Committee on Education Programs in Athletic Training (JRC-AT). The JRC-AT formulated standards and guidelines, entitled *Guidelines for Development and Implementation of NATA Approved Undergraduate Athletic Training Education Programs*,<sup>1,5</sup> for review and accreditation of professional programs. This document was combined with the existing competencies and formatted into the Commission on Allied Health Education Accreditation (CAHEA) acceptable format, resulting in the *Standards and Guidelines for an Accredited Education Program for the Athletic Trainer*.<sup>1,46</sup> At this time in history the focus and direction of AT was intended to concentrate on curriculum and degree development since AT programs were separating themselves from previously paired majors such as physical education. In the mid-1990s CAHEA disbanded under the direction of the AMA, and the Commission on Accreditation of Allied Health Education Programs (CAAHEP) was formed. This transition was seamless and primarily continued the use of the existing governing documents.<sup>1</sup> During this time however, students were still eligible to sit for the National Athletic Trainers' Association Board Of Certification (NATABOC) examination if they graduated from an internship program and accumulated a minimum of 1500 clinical experience hours. However, in 1996 the NATA Education Task Force released

recommendations to the NATA Board of Directors that recommended the removal of the internship route to certification, solidifying the need and importance of an accredited AT curriculum in the development and education of athletic training students. This recommendation was fully implemented by 2004.<sup>1,7-9</sup> Additional recommendations made at this time included supporting the possibility of entry-level education provided at the graduate level, increasing the education and training of clinical education instructors, examining the requirements related to clinical education, and developing an educational committee.<sup>1,7,8</sup> The release of the CAAHEP standards in 2001 was intended to bring a focus to some of these specific recommendations.<sup>47</sup>

Following the phasing out of the internship route to certification the JRC-AT component of CAAHEP disbanded to form the Commission for Accreditation of Athletic Training (CAATE) in 2006.<sup>10</sup> The CAATE reviewed and revised the existing accreditation standards that the CAAHEP had approved and implemented in 2001 and re-released them in 2005. This was intended to result in standards that were more clearly organized, as well as to further increase the focus on the recommendations made in 1996.<sup>48</sup> The CAATE released the most recent version of accreditation standards in 2012 which included a significantly different format and focus of education which intended to give more autonomy to institutions as far as curriculum, but had more specific directives regarding clinical education, outcomes, and public availability of outcomes and policies.

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Athletic training education has evolved over the years guided by changes in both accrediting agencies and the development and refinement of the accreditation standards. Three changes in accreditation agency have yielded four sets of accreditation standards

over the course of the last three decades. The changes to the standards are reflective of the practice of athletic trainers at the time, but also of the goals and future directions of the profession as well. This Qualitative Content Analysis (QCA) involves the review of the Standards from the Joint Review Committee- Athletic Training (JRC-AT) in 1991, the Standards from the Committee for Accreditation of Allied Health Education Programs in 2001 (CAAHEP), a revision of those standard in 2005 by the CAATE, and the most recent set of standards released by the CAATE in 2012. The aim of this study was to determine if and how changes in the standards reflect the direction of education, the goals and mission of the accrediting body, and the time period in which the standards were utilized.

#### Reflexivity and Bias

This analysis was approached within a social-constructivist paradigm that denotes that the researcher and the research are linked and impact each other.<sup>49</sup> With that in mind it is important to disclose the potential biases that may possibly influence the interpretation of this data. The lead researcher (JC) is a current employee of the CAATE, the group whom created the 2012 standards that were analyzed, and as such has a much greater knowledge base surrounding these standards, and additionally has knowledge based on the interpretation and intention behind the standards that the typical athletic trainer is unlikely to possess. Additionally, the lead researcher (JC) graduated from a CAAHEP accredited program, and therefore has a greater knowledge of what educational practices were at that time, which has the potential to prejudice findings of the educational direction of that time. However, the use of QCA helps to ensure that the standards were analyzed in the same manner regardless of their origin.

## Methods

It was determined that qualitative content analysis was appropriate for this review of documents as this study is primarily descriptive in nature and the content being examined is in some cases repetitive, but for the most part similar in format and context.<sup>50</sup> The tradition of this approach was phenomenological in nature, in that the Standards are a shared experience that all AT educators and students experience, and the direction of AT education is in some ways shaped by this phenomenon.<sup>49</sup>

### *Data Collection*

Data were collected by contacting the current CAATE accreditation office assistant and asking for an electronic copy of all sets of standards since AT accreditation became official. This resulted in the electronic transfer of all four editions of standards.

### *Data Management and Analysis*

Units of analysis were established as the four sets of accreditation standards. Segmentation of each unit of analysis was performed to determine units of coding, meaning that each set of accreditation standards was examined to determine how to separate its contents for coding. Contextual segmentation would involve utilizing topics or ideas to separate out content into units. Formal criterion segmentation involves utilizing the existing structure of the work, such as sentences, paragraphs, or pages to separate out units of coding. Formal criterion was used to determine segmentation due to the inherent structure of the documents as each individual standard is separated within each of the documents.<sup>50</sup>

The coding frame was content driven and was initially derived from the headings within the most recent set of standards. The initial coding frame was utilized for pilot

testing on the 2012 standards document and the 1991 standards document. Both documents were coded 16 days apart by the same researcher. Conflicts of coding were reviewed, and decision rules created and applied. Primarily conflicts resulted from the bias of the researcher based on contextual information relating to the data, in that some standards, while residing under a certain heading in the document, didn't definitively fall under the same corresponding category within the coding frame. This pilot testing resulted in the addition of two sub-categories that were not included in the original coding framework. The final categories of the coding framework were Sponsorship, Outcomes, Personnel, Program Delivery, Health and Safety, Resources, Operational Policies and Fair Practices, Program Description, AT Accrediting Agency, and Residual. Residual categories and sub-categories were included at all levels to ensure that all data segments are included in the analysis. Sponsorship had three sub-categories: Agreements, Sponsoring Institution Requirements (Degree, Accreditation, Responsibilities, and Residual), and Residual. Outcomes also had three sub-categories: Planning, Measures (BOC Exam, Other Measures, Availability of Outcomes, and Residual), and Residual. Personnel had seven sub-categories: Program Director, Clinical Education Coordinator, Instructional Staff, Preceptor/ACI, Other Health Care Instructors, Quantity, and Residual. Program Delivery had three sub-categories: Instructional Curriculum, Clinical Education (Experience Types, Evaluation, Policies, and Residual), and Residual. Health and Safety had four sub-categories: Legal (Technical Standards, Legal Compliance, and Residual), Emergency Action Plans, Infection Prevention, and Residual. Resources also had four sub-categories: Facilities, Instructional, Equipment, and Residual. Operational Policies and Fair Practices had three sub-categories: Admissions, Information Availability, and



Residual. Program Description had four sub-categories: Curriculum Documents, Distance Learning, Student Records, and Residual. AT Accrediting agency had only two sub-categories: Purpose and Responsibilities and Residual. The Residual category had no additional sub-categories within it. (Tables II.A.1, II.A.2, & II.A.3)

Main analysis was conducted over two phases, the first occurring 18 days after the pilot testing. All analyses were hand-coded by the researcher on hard copies of the documents and then transferred to coding tables (Table II.B.1). Seventeen days after the first phase the second phase was conducted, transferred, and reliability was assessed. Reliability in content analysis is the percentage of agreement between coders, or between the same coder during different phases or trials.<sup>50</sup> Reliability of the 1991 JRC-AT Document was assessed at 96%, the 2001 CAAHEP document at 97%, the 2005 CAATE document at 97%, and the 2012 CAATE document at 97%. There was an overall intra-rater reliability of 97%. Although these are unusually high reliability values, the high values can be attributed to the use of the content driven coding frame on documents that are already formatted in a structured way, but also because the same researcher did all of the coding. It is likely that the addition of another researcher into the coding process may have resulted in a lower inter-rater reliability statistic.

Following the coding process frequency tables were generated and examined as a comparison of all four documents for both main categories and sub-categories. (Figures II.A.1, II.A.2, II.A.3, II.A.4, II.B.1, II.B.2, II.B.3, II.B.4, II.B.5, II.B.6, II.B.7, II.B.8, II.B.9)

### Main Findings and Discussion

#### *Categories*

The sponsorship category revealed an increasing trend in number of standards relating to sponsorship from 1991-2005. The spike of this category in 2005 can be attributed to this being the first set of standards following the removal of the internship route, requiring all programs and institutions to obtain and maintain accreditation. This requirement still exists, however, there is a substantial drop off in the frequency of this category in 2012. Some additional research netted the information that for the 2012 standards the CAATE determined that a separate document be released titled *Pursuing and Maintaining Accreditation of Professional Programs in Athletic Training* (CAATE, 2012). The information contained in this document details the directives regarding the information formerly contained within the standards documents relevant to obtaining and continuing accreditation. This trend was also mirrored in the Personnel category. This tendency is reflective of the increasing need for designated faculty for AT programs, culminating in 2005 with the introduction of the Approved Clinical Instructor and the Clinical Instructor; who were responsible for supervising and evaluating students in Clinical Education, and the Clinical Instructor Educator who was responsible for educating and training those instructors on a variety of topics related to clinical education supervision. This process was simplified, as can be seen in the frequency of this category in 2012, when the preceptor was introduced as the clinical education supervisor, and the additional requirement of the Clinical Education Coordinator to oversee all components of clinical education.

One of the surprising main category findings was the downward trend of the requirements of resources within the 2012 standards. This may be attributed to the 2012 standard's implication that the Program Director should be responsible for ensuring the

all resources are adequate to support the size of the existing program, but this also could be interpreted as an alarming trend away from requiring an institution to espouse for financial resources to support existing programs. Ideally, if the Program Director has the support of institutional administrators, then support for an academic program should be similar to that of other majors within the same institution. It would be difficult to delineate within the Standards exactly what resources are needed for each program, and needs would vary widely between types and sizes of programs. However, it is possible that the observable decrease in the frequency of standards guiding resources for programs could have negative ramifications on programs, particularly programs at smaller institutions. Some administrators require more specific guidance and direction within the Standards in order to justify allocation of resources, therefore the current Standards are problematic in this scenario. The CAATE may need to re-evaluate the emphasis provided to this area as more programs undergo programmatic review.

### *Sub-Categories*

In addition to the aforementioned themes and trends, there were some other noticeable changes within the sub-categories for outcomes which seem to implicate an increased focus outcomes in general. This seems to indicate an increasing desire of the accreditation agency to focus on outcome driven education, and ensuring that programs are forthright about what their outcomes actually are. By requiring programs to collect certain universal outcomes and make them publicly available, the accrediting agency is compelling programs to be accountable to consumers; students and parents. Students may be better able to compare the quality of programs based on these outcomes, and select the program that will best prepare them for early professional success.

Additionally, this increased focus on outcome collection as a whole encourages the cyclic process of program evaluation by which a program consistently self-assesses their programmatic goals, their ability to meet those goals, and subsequently adjust their curriculum or processes to develop new methods in which their students can be successful.

Within the program delivery sub-categories there were three noticeably different trends, one of which is seemingly in conflict with that of the outcomes sub-category. Clinical education evaluation was non-existent in 1991, but spiked in 2001, and then dropped for 2005 and 2012. The lack of directive need for evaluation and subsequently outcome measures for clinical education in part could be explained in the difficulty of regulating and measuring these experiences, but also could be indicative of a perceived lack of emphasis of the impact of clinical education on the development of the athletic training student. It is possible that programs are including clinical outcomes within their overall comprehensive outcome plan; however, this is frequently done in the form of competency assessment, as opposed to ensuring that students see and treat a wide variety of patients. Clinical outcomes may need greater emphasis in the future to encourage programs to focus on this component of the educational experience. This potential trend is particularly interesting given the increased focus on outcomes overall for programs in the more recent standards. There was also a decrease in emphasis on instructional curriculum, which is likely attributed to the accrediting agency allowing for overall program autonomy. With the introduction of the competencies that are required within the curriculum, programs now have the liberty to determine in which classes those skills are taught in lieu of having to incorporate specific classes. Lastly within these sub-

categories there was an increasing theme for policies, most noticeably following the 2001 standards, which are likely in place to protect the students from use as a faculty/staff member, thus ensuring the clinical education experiences are in fact educational. This can be seen in the most recent set of standards as there are many repetitive statements of the phrase “clinical education experiences must be educational in nature”.

Some people could interpret a decreasing theme for information availability, under the category of operational policies and fair practices, as there is a decrease in standard frequency; however, it can be interpreted as likely being due to fewer documents being published in hard copy and most information being disseminated via websites, thus potentially resulting in more effective blanket standards regarding what must be available on program and institution websites. This inclination similarly is seen in the sub-category of distance learning, which is noticeably absent in the 1991 and 2001 standards, but is not likely due to a lack of focus on distance learning during that time frame, but more accurately a lack of existence of distance learning during that time. It is interesting that technological advances are seen reflectively within the standards for accreditation of educational programs.

### Limitations

One limitation of this analysis is that there was only one researcher responsible for the coding. This likely resulted in the high level of reliability for coding. One additional limitation was the operational definition of the unit of coding. By indicating that each unit of coding would be separated by the accreditation body’s numbering, the 2005 standards inherently had a high number of units of coding, which may make it difficult to objectively analyze the frequency counts. For example, an individual standard

in the 2012 Standards would have one number resulting in one unit, whereas in the 2005 Standards it may have been numbered A3.1, A3.2, and A3.3. When coding this individual standard in the 2012 Standards it would have one unit and therefore a frequency of one, while in the 2005 Standards it would have three units and a frequency of three, even though they may contain the same information. This results in automatically higher frequency counts which could be misinterpreted as trends.

### Conclusions

If the trends are interpreted chronologically it would be clear that as AT has become more recognized and consistently present, both in the health care profession and within educational institutions, there is less of a need for prescriptive curriculum outlines and listed required resources. There has been an increased need for programs to be accountable to students by providing them an avenue for professional success, and this is seen in the priority of outcomes and outcome driven curriculum changes. There is also a potential downward trend in focus on clinical education and its outcomes which may be of concern given the magnitude of the impact of this component of the educational experience.

It is evident that changes in educational focus and practices can be seen by analyzing the content of the education accreditation standards. With some consideration some of the changes in AT education can be better understood by reflecting upon the historical context of the documents and the potential focus of each set of accreditation standards becomes clearer within this type of analysis.

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**Table II.A.1: Pilot Coding Frame**

Category	Sub Categories	Sub Categories
A. Sponsorship	A. Agreements B. Sponsoring Institution Requirements C. Residual	A. Degree B. Accreditation C. Responsibilities D. Residual
B. Outcomes	A. Planning B. Measures C. Residual	A. BOC Exam B. Other Measures C. Availability of Outcomes D. Residual
C. Personnel	A. Program Director B. Clinical Education Coordinator C. Instructional Staff D. Preceptor/ACI E. Other Health Care Instructors F. Residual	
D. Program Delivery	A. Instructional Curriculum B. Clinical Education C. Residual	A. Experience Types B. Evaluation C. Policies D. Residual
E. Health and Safety	A. Legal B. Emergency Action Plans C. Infection Prevention D. Residual	A. Technical Standards B. Legal Compliance C. Residual
F. Resources	A. Facilities B. Instructional C. Equipment D. Residual	
G. Operational Policies and Fair Practices	A. Admissions B. Information Availability C. Residual	
H. Program Description	A. Curriculum Documents	

	B. Distance Learning
	C. Residual
I. AT Accrediting Agency	
	A. Purpose and Responsibilities
	B. Residual
J. Residual	

**Table II.A.2: Final Coding Frame**

Category	Sub Categories	Sub Categories
A. Sponsorship	A. Agreements	
	B. Sponsoring Institution Requirements	A. Degree B. Accreditation C. Responsibilities D. Residual
	C. Residual	
B. Outcomes	A. Planning	
	B. Measures	A. BOC Exam B. Other Measures C. Availability of Outcomes D. Residual
	C. Residual	
C. Personnel	A. Program Director	
	B. Clinical Education Coordinator	
	C. Instructional Staff	
	D. Preceptor/ACI	
	E. Other Health Care Instructors	
	<b>F. Quantity</b>	
	G. Residual	
D. Program Delivery	A. Instructional Curriculum	
	B. Clinical Education	A. Experience Types B. Evaluation C. Policies D. Residual
	C. Residual	
E. Health and Safety	A. Legal	A. Technical Standards B. Legal Compliance C. Residual
	B. Emergency Action Plans	
	C. Infection Prevention	
	D. Residual	
F. Resources	A. Facilities	
	B. Instructional	
	C. Equipment	
	D. Residual	
G. Operational Policies and Fair Practices	A. Admissions	
	B. Information Availability	
	C. Residual	

<hr/>	
H. Program	
Description	A. Curriculum Documents
	B. Distance Learning
	<b>C. Student Records</b>
	D. Residual
<hr/>	
I. AT Accrediting	
Agency	A. Purpose and Responsibilities
	B. Residual
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J. Residual	
<hr/>	



**Table II.A.3: Pilot Phase Coding Table of 1991 and 2012**

<b>Unit of Analysis = JRC-AT Standards (1991)</b>					
Unit of Data	1st Pilot Phase	2nd Pilot Phase	Final Code	Decision Rule	
1.1	I.A	I.A	I.A	If it doesn't specifically reference the responsibilities of the accrediting agency it belongs in residual	
1.2	I.A	I.A.	I.A		
1.3	I.B	I.B	I.B		
1.4	I.B	I.A	I.B	Providing list and information regarding programs for the public is a responsibility of the agency	
1.5	I.A	I.A	I.A		
1.6	I.A.	I.B	I.B	Not regarding accreditation but the responsibility of alignment of the institution	
1.7	I.A	I.A	I.A		
1.8	A.B.B.	A.B.B	A.B.B		
1.9	A.A	A.A	A.A		
1.10	A.B.C	A.B.B	A.B.C	Refers to the institution being accredited	
1.11	A.B.C.	A.B.C	A.B.C		
1.12	A.B.B.	A.B.A	A.B.B		
1.13	C.F	C.F	C.F		
1.14	C.A	C.A	C.A		
1.15	C.A	C.A	C.A		
1.16	C.A	C.A	C.A		
1.17	C.A	C.A	C.A		
1.18	C.D	C.D	C.D		
1.19	C.D	C.D	C.D		
1.20	C.D	C.D	C.D		
1.21	C.D	C.D	C.D		
1.22	C.C	C.C	C.C		
1.23	C.C	C.C	C.C		
1.24	C.C	C.C	C.C		
1.25	C.F	C.F	C.F		

1.26	C.C	C.C	C.C	
1.27	C.E	C.E	C.E	
1.28	C.E	C.E	C.E	
1.29	C.E	C.E	C.E	
1.30	C.E	C.E	C.E	
1.31	C.E	C.E	C.E	
1.32	C.E	C.E	C.E	
1.33	C.E	C.E	C.E	
1.34	C.E	C.E	C.E	
1.35	C.F	C.F	C.F	
				refers to personnel prof. development, not resources
1.36	F.D	C.G	C.G	
1.37	F.B	F.B	F.B	
1.38	F.A	F.A	F.A	
1.39	F.A	F.A	F.A	
1.40	F.A	F.A	F.A	
1.41	F.C	F.C	F.C	
1.42	F.C	F.C	F.C	
1.43	F.C	F.C	F.C	
1.44	F.C	F.C	F.C	
1.45	F.C	F.C	F.C	
1.46	F.B	F.B	F.B	
1.47	F.B	F.B	F.B	
				refers to instructional aids, not specifically equipment
1.48	F.B	F.C	F.B	
1.49	F.B	F.B	F.B	
1.50	G.A	G.A	G.A	
1.51	G.B	G.B	G.B	
1.52	G.A	G.A	G.A	
1.53	G.B	G.B	G.B	
				refers specifically to curriculum documents
1.54	H.A	G.B	H.A	
1.55	E.A.A	E.A.A	E.A.A	
				counseling is not required by law, therefore not legal
1.56	E.A.B	E.D	E.D	
1.57	G.B	G.B	G.B	
				refers to admissions process
1.58	E.A.B	G.A	G.A.	
1.59	G.B.	G.B	G.B	
1.60	G.B	G.B	G.B	
1.61	G.B	G.B	G.B	

1.62	G.B	G.B	G.B	health and safety safeguarded but not a legal compliance issue
1.63	D.B.C	D.B.C	D.B.C	
1.64	E.D	E.A.B	E.D	
1.65	G.B	G.B	G.B	must plan to obtain outcome measures
1.66	H.B.C	H.B.C	H.B.C	
1.67	B.B.B	B.A	B.A	
1.68	A.B.A	A.B.A	A.B.A	refers to use of outcome measures
1.69	A.B.A	A.B.A	A.B.A	
1.70	B.A	B.A	B.A	
1.71	J	J	J	
1.72	J	J	J	
1.73	H.A	H.A	H.A	
1.74	H.A	H.A	H.A	
1.75	D.A	D.A	D.A	
1.76	B.B.B	B.B.C	B.B.C	
1.77	D.A	D.A	D.A	
1.78	D.A	D.A	D.A	refers specifically to clinical education policy program director job responsibilities
1.79	D.A	D.A	D.A	
1.80	D.A	D.A	D.A	
1.81	D.B.C	D.A	D.B.C	
1.82	C.A	D.B.A	C.A	
1.83	D.B.A	D.B.A	D.B.A	
1.84	D.B.A	D.B.A	D.B.A	
1.85	D.B.A	D.B.A	D.B.A	
1.86	D.B.A	D.B.A	D.B.A	
1.87	D.B.C	D.B.C	D.B.C	
1.88	D.B.A	D.B.A	D.B.A	makes no reference to clinical education
1.89	D.A	D.B.C	D.A.	
1.90	D.A	D.A	D.A	
1.91	D.A	D.A	D.A	
1.92	D.A	D.A	D.A	
1.93	A.B.B.	A.B.B	A.B.B	
1.94	A.B.B.	A.B.B	A.B.B	
1.95	A.B.B.	A.B.B	A.B.B	
1.96	A.B.B.	A.B.B	A.B.B	
1.97	A.B.B.	A.B.B	A.B.B	

1.98	A.B.B.	A.B.B	A.B.B
1.99	A.B.B.	A.B.B	A.B.B
1.100	A.B.B.	A.B.B	A.B.B
1.101	A.B.B.	A.B.B	A.B.B
1.102	A.B.B.	A.B.B	A.B.B
1.103	A.B.B.	A.B.B	A.B.B
1.104	A.B.B.	A.B.B	A.B.B
1.105	A.B.B.	A.B.B	A.B.B
1.106	A.B.B.	A.B.B	A.B.B
1.107	A.B.B.	A.B.B	A.B.B
1.108	A.B.B.	A.B.B	A.B.B
1.109	A.B.B.	A.B.B	A.B.B
1.110	A.B.B.	A.B.B	A.B.B

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#### **Unit of Analysis = CAATE Standards 2012**

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Unit of Data	1st Pilot Phase	2nd Pilot Phase	Final Code	Decision Rule
4.1	I.A	I.A	I.A	
4.2	I.A	I.A	I.A	
4.3	I.A	I.A	I.A	
4.4	J	J	J	
4.5	J	J	J	
4.6	A.B.B	A.B.B	A.B.B	
4.7	A.B.A	A.B.A	A.B.A	
4.8	A.A	A.A	A.A	
4.9	B.A	B.A	B.A	
4.10	B.A	B.A	B.A	
4.11	B.B.B	B.B.B	B.B.B	
4.12	B.B.A	B.B.A	B.B.A	
4.13	B.B.C	B.B.C	B.B.C	
4.14	B.B.B	B.B.B	B.B.B	
4.15	B.B.B.	B.B.B	B.B.B	
4.16	B.B.A	B.B.A	B.B.A	
4.17	B.A	B.A	B.A	
4.18	B.A	B.A	B.A	
4.19	C.A	C.A	C.A	
4.20	C.A	C.A	C.A	
4.21	C.A	C.A	C.A	
4.22	C.A	C.A	C.A	
4.23	C.A	C.A	C.A	
4.24	C.A	C.A	C.A	
4.25	C.A	C.A	C.A	

4.26	C.A	C.A	C.A
4.27	C.B	C.B	C.B
4.28	C.B	C.B	C.B
4.29	C.B	C.B	C.B
4.30	C.C	C.C	C.C
4.31	C.C	C.C	C.C
4.32	C.C	C.C	C.C
4.33	C.C	C.C	C.C

This is referring to the qualification of instructors who are AT's

4.34	C.E	C.C	C.C
4.35	C.F	C.F	C.F
4.36	C.F	C.F	C.F
4.37	C.F	C.F	C.F
4.38	C.F	C.F	C.F
4.39	C.F	C.F	C.F
4.40	C.E	C.E	C.E
4.41	C.E	C.E	C.E
4.42	C.D	C.D	C.D
4.43	C.D	C.D	C.D
4.44	C.D	C.D	C.D
4.45	C.D	C.D	C.D
4.46	C.D	C.D	C.D
4.47	D.A	D.A	D.A
4.48	D.A	D.A	D.A
4.49	D.A	D.A	D.A

Syllabi are in reference to all courses, not just clinical education

4.50	D.A	D.B.C	D.A
4.51	D.B.A	D.B.A	D.B.A
4.52	D.B.A	D.B.A	D.B.A
4.53	D.B.A	D.B.A	D.B.A

Non-discriminatory policy with regard to experience types

4.54	D.B.C	D.B.A	D.B.C
4.55	D.B.A	D.B.A	D.B.A
4.56	D.B.C	D.B.C	D.B.C
4.57	C.D.	C.D	C.D
4.58	C.E	C.E	C.E
4.59	D.B.C	D.B.C	D.B.C

4.60	D.A	D.B.C	D.B.C	Policy regarding didactic order of instruction
4.61	D.A	D.B.C	D.B.C	Policy regarding didactic order of instruction
4.62	D.B.C.	D.B.C	D.B.C	
4.63	D.B.C	D.B.C	D.B.C	
4.64	D.B.C	D.B.C	D.B.C	
4.65	D.B.C	D.B.C	D.B.C	
4.66	D.B.C	D.B.C	D.B.C	
4.67	D.B.C	D.B.C	D.B.C	
4.68	D.B.C	D.B.C	D.B.C	
4.69	D.B.C	D.B.C	D.B.C	
4.70	E.A.A	E.A.A	E.A.A	
4.71	E.A.A	E.A.A	E.A.A	
4.72	E.C	E.C	E.C	
4.73	E.C	E.C	E.C	
4.74	E.C	E.C	E.C	
4.75	E.A.B	E.A.B	E.A.B	
4.76	E.A.B	E.A.B	E.A.B	
4.77	E.A.B	E.A.B	E.A.B	
4.78	E.A.B	E.A.B	E.A.B	
4.79	E.C	E.C	E.C	
4.80	E.C	E.A.B	E.A.B	OSHA training is legal requirement for health care education
4.81	E.C	E.A.B	E.A.B	OSHA training is legal requirement for health care education
4.82	E.C	E.C	E.C	
4.83	E.C	E.C	E.C	
4.84	E.B	E.B	E.B	
4.85	E.B	E.B	E.B	
4.86	E.B	E.B	E.B	
4.87	F.B	F.B	F.B	
4.88	F.C	F.B	F.B	Mentions some equipment, but equipment is for classroom instruction
4.89	F.A	F.A	F.A	

4.90	F.B	F.C	F.B	Instructional aids
4.91	F.C	F.C	F.C	
4.92	F.B	F.B	F.B	
4.93	F.A	F.A	F.A	
4.94	G.A	G.A	G.A	
4.95	G.B	G.B	G.B	
4.96	G.B	G.B	G.B	
				Not About the creation of the documents, but the availability of them
4.97	H.A	G.B	G.B	Not About the creation of the documents, but the availability of them
4.98	H.A	G.B	G.B	Not About the creation of the documents, but the availability of them
4.99	H.A	G.B	G.B	Not About the creation of the documents, but the availability of them
4.100	H.A	G.B	G.B	Not About the creation of the documents, but the availability of them
4.101	G.B	G.B	G.B	
4.102	G.B	G.B	G.B	
4.103	G.B	G.B	G.B	
4.104	H.C	H.C	H.C	
4.105	H.C	H.C	H.C	
4.106	H.C	H.C	H.C	
4.107	H.C	H.C	H.C	
4.108	H.C	H.C	H.C	
4.109	H.C	H.C	H.C	
4.110	H.C	H.C	H.C	
4.111	H.C	H.C	H.C	
4.112	H.B	H.B	H.B	
4.113	H.B	H.B	H.B	
4.114	H.B	H.B	H.B	
4.115	H.B	H.B	H.B	

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**Table II.B.1: Main Analysis Coding .**

<b>Unit of Analysis: JRC-AT Standards (1991)</b>			
Unit of Data	Code 1	Code 2	Final Code
1.1	IA	IA	IA
1.2	IA	IA	IA
1.3	IB	IB	IB
1.4	IB	IB	IB
1.5	IA	IA	IA
1.6	IA	IA	IA
1.7	IA	IA	IA
1.8	ABB	ABB	ABB
1.9	AA	AA	AA
1.10	ABC	ABC	ABC
1.11	ABC	ABC	ABC
1.12	ABC	ABC	ABC
1.13	CF	CF	CF
1.14	CA	CA	CA
1.15	CA	CA	CA
1.16	CA	CA	CA
1.17	CA	CA	CA
1.18	CD	CD	CD
1.19	CD	CD	CD
1.20	CD	CD	CD
1.21	CC	CC	CC
1.22	CC	CC	CC
1.23	CC	CC	CC
1.24	CF	CF	CF
1.25	CC	CF	CC
1.26	CE	CE	CE
1.27	CE	CE	CE
1.28	CE	CE	CE
1.29	CE	CE	CE
1.30	CE	CE	CE
1.31	CE	CE	CE
1.32	CE	CE	CE
1.33	CF	CF	CF
1.34	CG	CG	CG
1.35	FB	FB	FB
1.36	FA	FA	FA
1.37	FA	FA	FA
1.38	FC	FC	FC
1.39	FC	FC	FC



1.40	FC	FC	FC
1.41	FC	FC	FC
1.42	FB	FB	FB
1.43	FB	FB	FB
1.44	FB	FB	FB
1.45	FB	FB	FB
1.46	GB	GB	GB
1.47	GA	GA	GA
1.48	GB	GB	GB
1.49	GB	GB	GB
1.50	EAA	EAA	EAA
1.51	EAB	EAB	EAB
1.52	GB	GB	GB
1.53	EAB	EAB	EAB
1.54	GB	GB	GB
1.55	GB	GB	GB
1.56	GB	GB	GB
1.57	GB	GB	GB
1.58	EAB	EAB	EAB
1.59	GB	GB	GB
1.60	HC	HC	HC
1.61	BA	BA	BA
1.62	BA	BA	BA
1.63	ABA	ABA	ABA
1.64	HC	HC	HC
1.65	J	J	J
1.66	J	J	J
1.67	<i>DA</i>	<i>HA</i>	<i>HA</i>
1.68	<i>DA</i>	<i>HA</i>	<i>HA</i>
1.69	DA	DA	DA
1.70	DA	DA	DA
1.71	DA	DA	DA
1.72	DA	DA	DA
1.73	DA	DA	DA
1.74	DA	DA	DA
1.75	<i>DA</i>	<i>DBC</i>	<i>DA</i>
1.76	DBC	DBC	DBC
1.77	DBC	DBC	DBC
1.78	DBA	DBA	DBA
1.79	DBA	DBA	DBA
1.80	DBA	DBA	DBA
1.81	<i>DBA</i>	<i>DBC</i>	<i>DBC</i>
1.82	DBA	DBA	DBA

1.83	DBC	DBC	DBC
1.84	DA	DA	DA
1.85	HA	HA	HA
1.86	HC	HC	HC
1.87	ABB	ABB	ABB
1.88	ABB	ABB	ABB
1.89	ABB	ABB	ABB
1.90	ABB	ABB	ABB
1.91	ABB	ABB	ABB
1.92	ABB	ABB	ABB
1.93	ABB	ABB	ABB
1.94	ABB	ABB	ABB
1.95	ABB	ABB	ABB
1.96	ABB	ABB	ABB
1.97	ABB	ABB	ABB
1.98	ABB	ABB	ABB
1.99	ABB	ABB	ABB
1.100	ABB	ABB	ABB
1.101	ABB	ABB	ABB
1.102	ABB	ABB	ABB
1.103	ABB	ABB	ABB
1.104	ABB	ABB	ABB
1.105	ABB	ABB	ABB
1.106	ABB	ABB	ABB
1.107	ABB	ABB	ABB
1.108	ABB	ABB	ABB
1.109	ABB	ABB	ABB
1.110	ABB	ABB	ABB

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**Unit of Analysis: CAAHEP Standards (2001)**


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Unit of Data	Code 1	Code 2	Final Code
2.1	IA	IA	IA
2.2	IA	IA	IA
2.3	IB	IB	IB
2.4	IB	IB	IB
2.5	IA	IA	IA
2.6	IA	IA	IA
2.7	IA	IA	IA
2.8	J	J	J
2.9	J	J	J
2.10	ABB	ABB	ABB
2.11	AA	AA	AA
2.12	AA	AA	AA
2.13	ABC	ABC	ABC

2.14	ABC	ABC	ABC
2.15	ABB	ABB	ABB
2.16	CF	CF	CF
2.17	CA	CA	CA
2.18	CA	CA	CA
2.19	CA	CA	CA
2.20	CA	CA	CA
2.21	CA	CA	CA
2.22	CA	CA	CA
2.23	CC	CC	CC
2.24	CC	CC	CC
2.25	CC	CC	CC
2.26	CC	CC	CC
2.27	CF	CF	CF
2.28	CF	CF	CF
2.29	CD	CD	CD
2.30	CD	CD	CD
2.31	CD	CD	CD
2.32	CD	CD	CD
2.33	CD	CD	CD
2.34	CD	CD	CD
2.35	CD	CD	CD
2.36	CD	CD	CD
2.37	CE	CE	CE
2.38	CE	CE	CE
2.39	CE	CE	CE
2.40	CE	CE	CE
2.41	CE	CE	CE
2.42	CE	CE	CE
2.43	CE	CE	CE
2.44	CF	CF	CF
2.45	CF	CF	CF
2.46	CG	CG	CG
2.47	CG	CG	CG
2.48	FB	FB	FB
2.49	FB	FB	FB
2.50	FA	FA	FA
2.51	FA	FA	FA
2.52	FA	FA	FA
2.53	FC	FC	FC
2.54	FC	FC	FC
2.55	FC	FC	FC
2.56	FC	FC	FC

2.57	FC	FC	FC
2.58	FC	FC	FC
2.59	FB	FB	FB
2.60	FB	FB	FB
2.61	FB	FB	FB
2.62	FB	FB	FB
2.63	GA	GA	GA
2.64	GB	GB	GB
2.65	GB	GB	GB
2.66	GB	GB	GB
2.67	GB	GB	GB
2.68	GB	GB	GB
2.69	DBB	DBB	DBB
2.70	DBB	DBB	DBB
2.71	EAA	EAA	EAA
2.72	EAB	EAB	EAB
2.73	EAB	EAB	EAB
2.74	<i>EAB</i>	<i>EAC</i>	<i>EAC</i>
2.75	GB	GB	GB
2.76	EAB	EAB	EAB
2.77	GB	GB	GB
2.78	GB	GB	GB
2.79	GB	GB	GB
2.80	GB	GB	GB
2.81	<i>EAB</i>	<i>DBC</i>	<i>EAB</i>
2.82	<i>EAB</i>	<i>DBC</i>	<i>EAB</i>
2.83	DBC	DBC	DBC
2.84	EAB	EAB	EAB
2.85	HC	HC	HC
2.86	BA	BA	BA
2.87	BC	BC	BC
2.88	BBC	BBC	BBC
2.89	BA	BA	BA
2.90	BA	BA	BA
2.91	BA	BA	BA
2.92	HC	HC	HC
2.93	HC	HC	HC
2.94	HC	HC	HC
2.95	ABA	ABA	ABA
2.96	ABA	ABA	ABA
2.97	GB	GB	GB
2.98	DA	DA	DA
2.99	DA	DA	DA

2.100	DA	DA	DA
2.101	DA	DA	DA
2.102	DA	DA	DA
2.103	DA	DA	DA
2.104	DA	DA	DA
2.105	DBC	DBC	DBC
2.106	DBC	DBC	DBC
2.107	DBA	DBA	DBA
2.108	DBA	DBA	DBA
2.109	DBA	DBA	DBA
2.110	DBA	DBA	DBA
2.111	DBA	DBA	DBA
2.112	DBC	DBC	DBC
2.113	DBC	DBC	DBC
2.114	DBC	DBC	DBC
2.115	DBC	DBC	DBC
2.116	DBC	DBC	DBC
2.117	DA	DA	DA
2.118	DA	DA	DA
2.119	DBC	DBC	DBC
2.120	<i>DBA</i>	<i>DBC</i>	<i>DBC</i>
2.121	DBC	DBC	DBC
2.122	DBC	DBC	DBC
2.123	DBB	DBB	DBB
2.124	DBB	DBB	DBB
2.125	ABB	ABB	ABB
2.126	ABB	ABB	ABB
2.127	ABB	ABB	ABB
2.128	ABB	ABB	ABB
2.129	ABB	ABB	ABB
2.130	ABB	ABB	ABB
2.131	ABB	ABB	ABB
2.132	ABB	ABB	ABB
2.133	ABB	ABB	ABB
2.134	ABB	ABB	ABB
2.135	ABB	ABB	ABB
2.136	ABB	ABB	ABB
2.137	ABB	ABB	ABB
2.138	ABB	ABB	ABB
2.139	ABB	ABB	ABB
2.140	ABB	ABB	ABB
2.141	ABB	ABB	ABB
2.142	ABB	ABB	ABB

2.143	ABB	ABB	ABB
2.144	ABB	ABB	ABB
2.145	ABB	ABB	ABB
2.146	ABB	ABB	ABB
2.147	ABB	ABB	ABB
2.148	ABB	ABB	ABB
2.149	ABB	ABB	ABB

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**Unit of Analysis: CAATE Standards (2005)**


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Unit of Data	Code 1	Code 2	Final Code
3.1	IA	IA	IA
3.2	IA	IA	IA
3.3	IA	IA	IA
3.4	J	J	J
3.5	J	J	J
3.6	ABB	ABB	ABB
3.7	ABB	ABB	ABB
3.8	AA	AA	AA
3.9	AA	AA	AA
3.10	CA	CA	CA
3.11	CA	CA	CA
3.12	CA	CA	CA
3.13	CA	CA	CA
3.14	CA	CA	CA
3.15	CA	CA	CA
3.16	CA	CA	CA
3.17	CA	CA	CA
3.18	CA	CA	CA
3.19	CA	CA	CA
3.20	CA	CA	CA
3.21	CA	CA	CA
3.22	CA	CA	CA
3.23	CC	CC	CC
3.24	CC	CC	CC
3.25	CC	CC	CC
3.26	CC	CC	CC
3.27	CF	CF	CF
3.28	CF	CF	CF
3.29	CF	CF	CF
3.30	CF	CF	CF
3.31	CG	CG	CG
3.32	CG	CG	CG
3.33	CG	CG	CG
3.34	CG	CG	CG

3.35	CG	CG	CG
3.36	CD	CD	CD
3.37	CD	CD	CD
3.38	CD	CD	CD
3.39	CD	CD	CD
3.40	CD	CD	CD
3.41	CD	CD	CD
3.42	CD	CD	CD
3.43	CD	CD	CD
3.44	CD	CD	CD
3.45	CD	CD	CD
3.46	CD	CD	CD
3.47	CD	CD	CD
3.48	CD	CD	CD
3.49	CD	CD	CD
3.50	CD	CD	CD
3.51	CE	CE	CE
3.52	CE	CE	CE
3.53	CE	CE	CE
3.54	CE	CE	CE
3.55	CF	CF	CF
3.56	CF	CF	CF
3.57	FB	FB	FB
3.58	FB	FB	FB
3.59	FB	FB	FB
3.60	FA	FA	FA
3.61	FA	FA	FA
3.62	FA	FA	FA
3.63	FA	FA	FA
3.64	FA	FA	FA
3.65	FA	FA	FA
3.66	FA	FA	FA
3.67	FA	FA	FA
3.68	FA	FA	FA
3.69	FB	FB	FB
3.70	FB	FB	FB
3.71	HB	HB	HB
3.72	HB	HB	HB
3.73	FC	FC	FC
3.74	FC	FC	FC
3.75	FC	FC	FC
3.76	FC	FC	FC
3.77	FC	FC	FC

3.78	FC	FC	FC
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**Unit of Analysis: CAATE Standards (2012)**

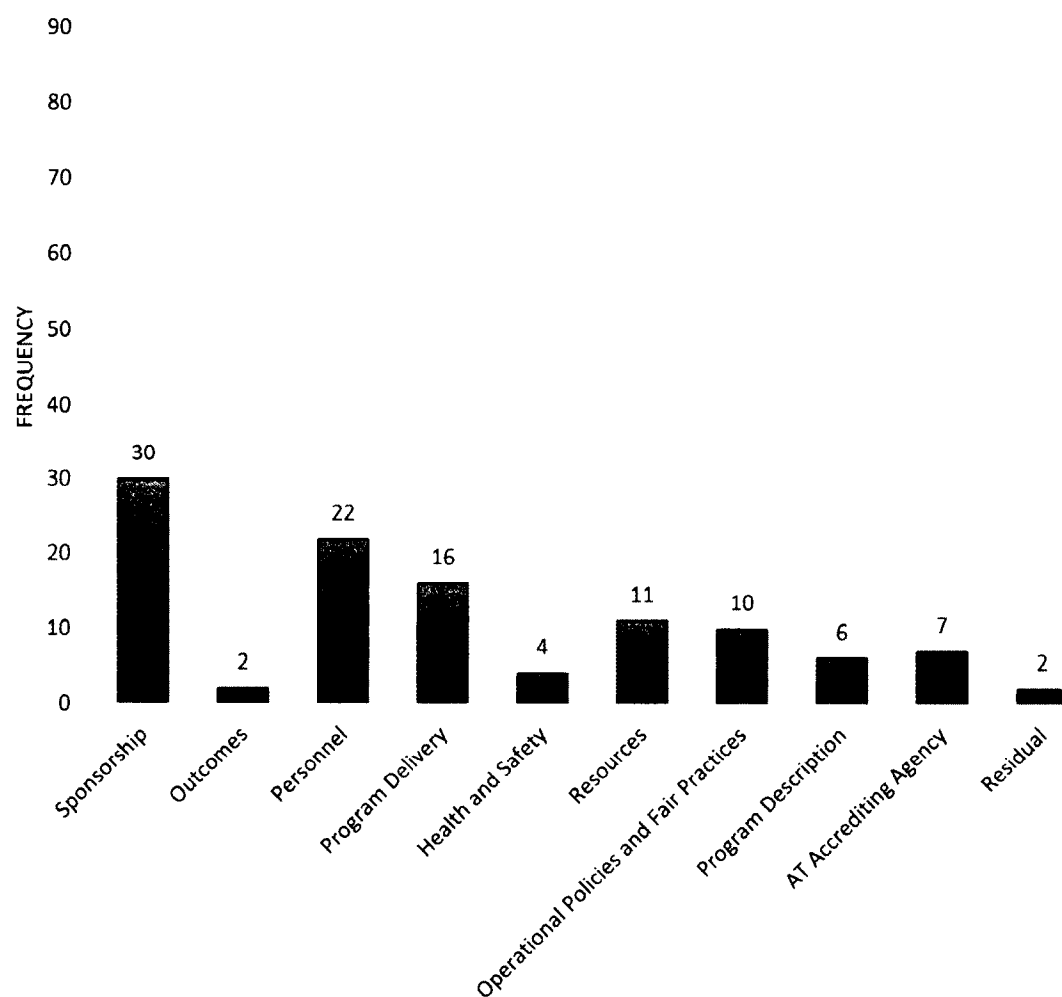

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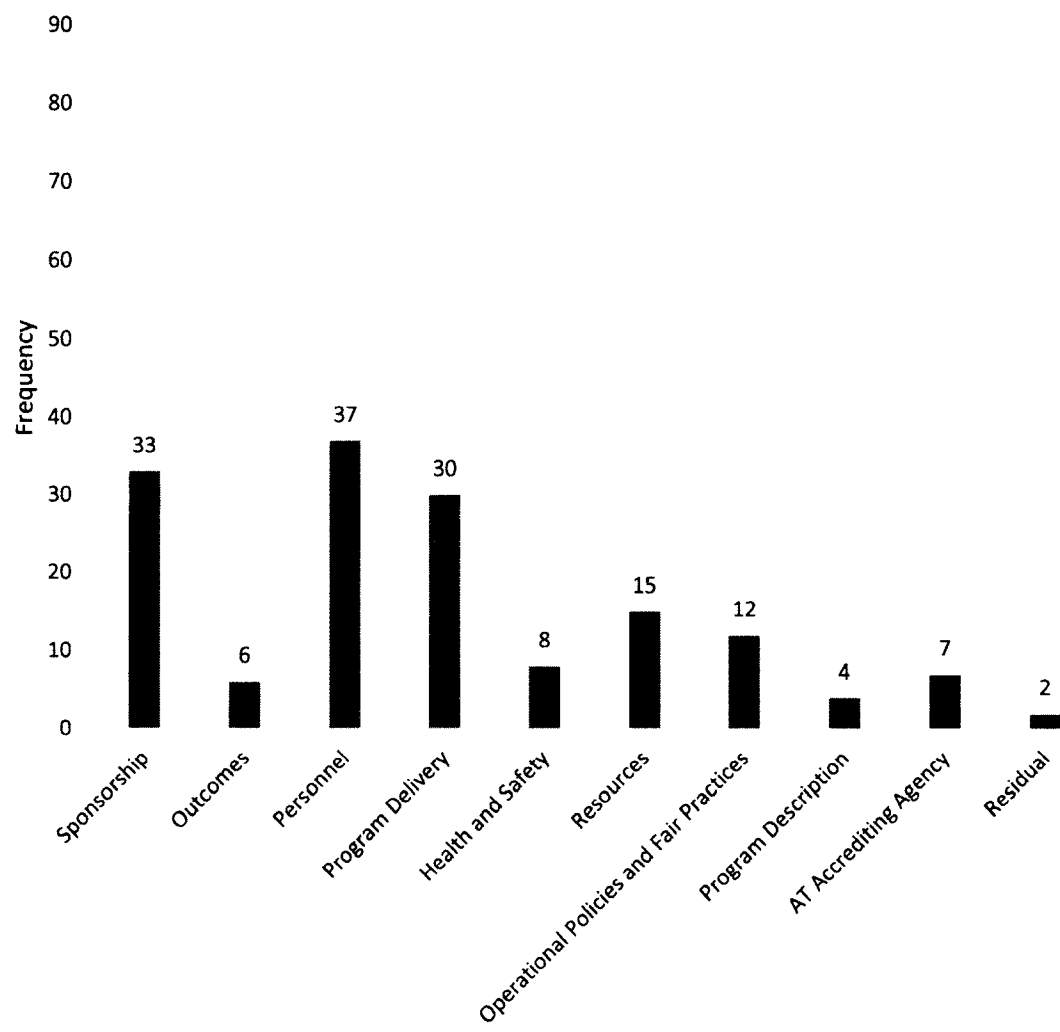
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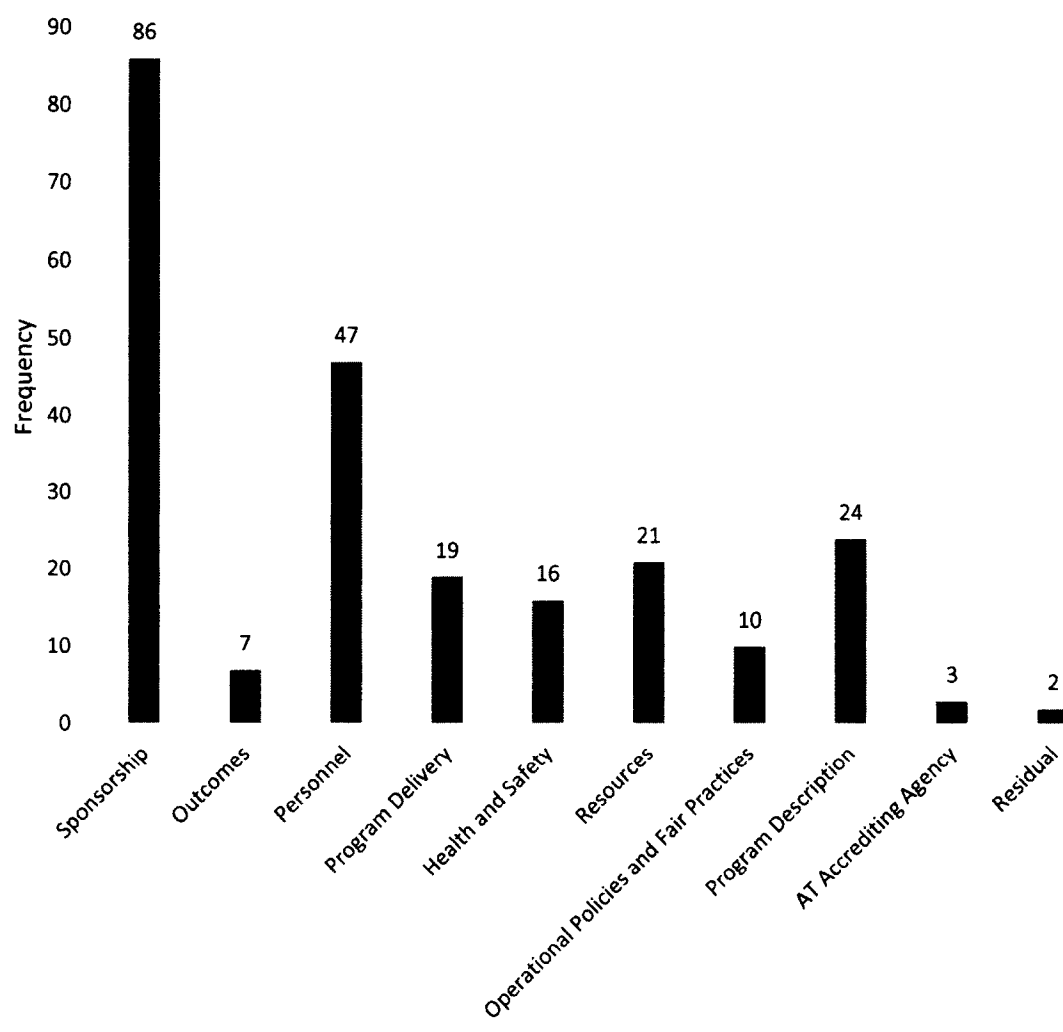
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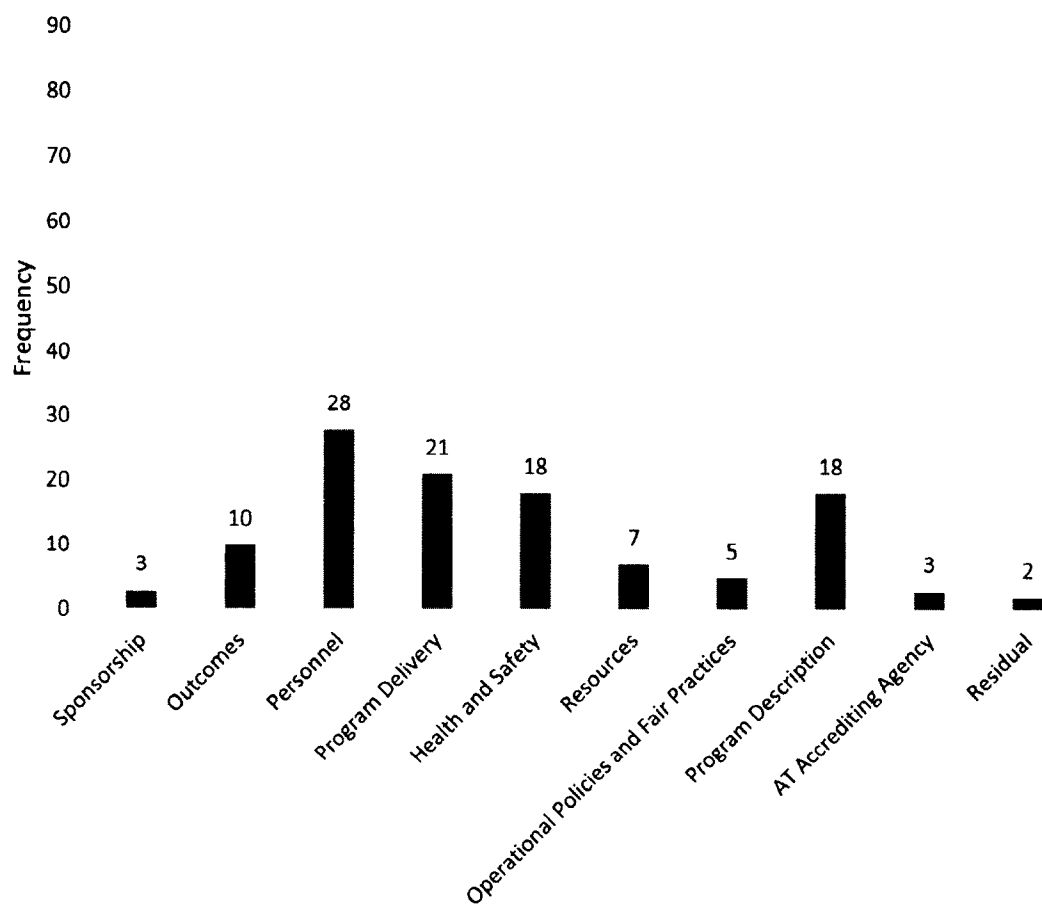
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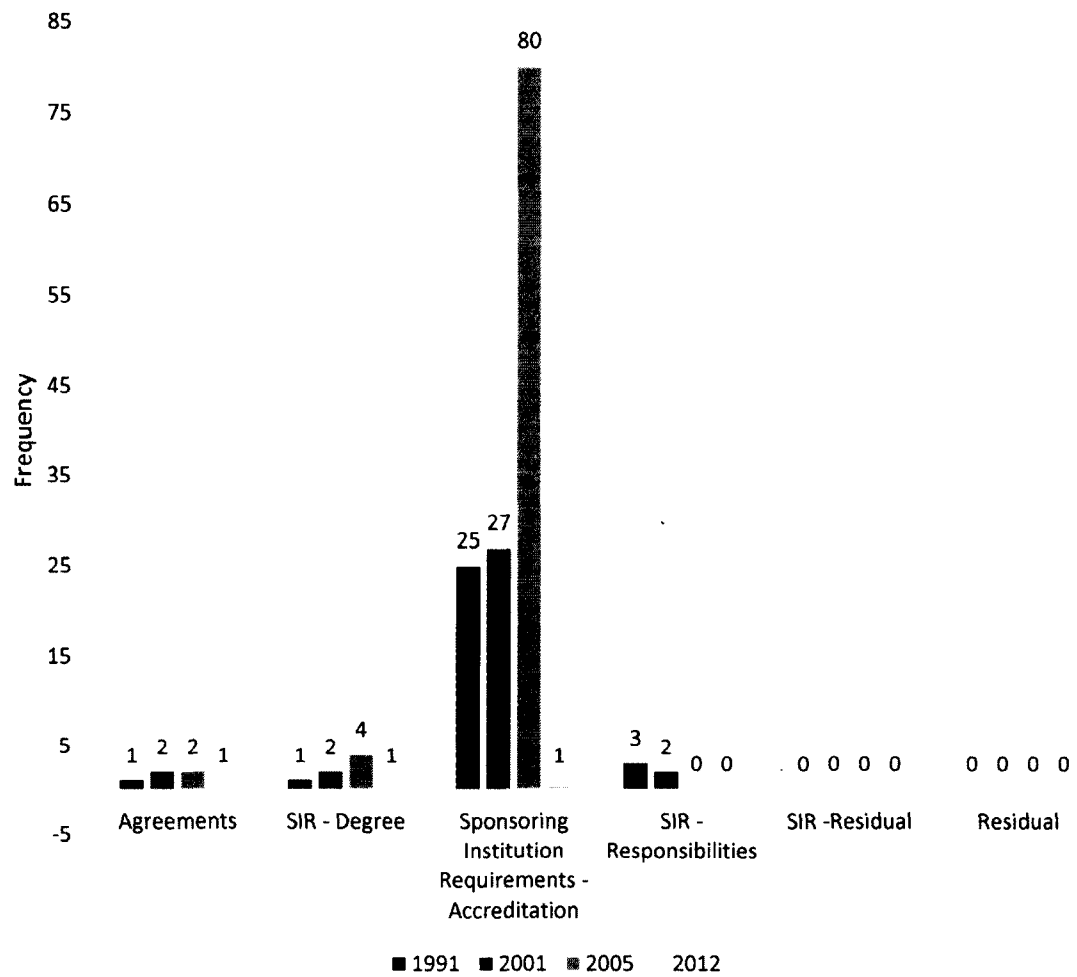
**Figure II.A.1: Category Frequency for JRC-AT (1991) Standards**

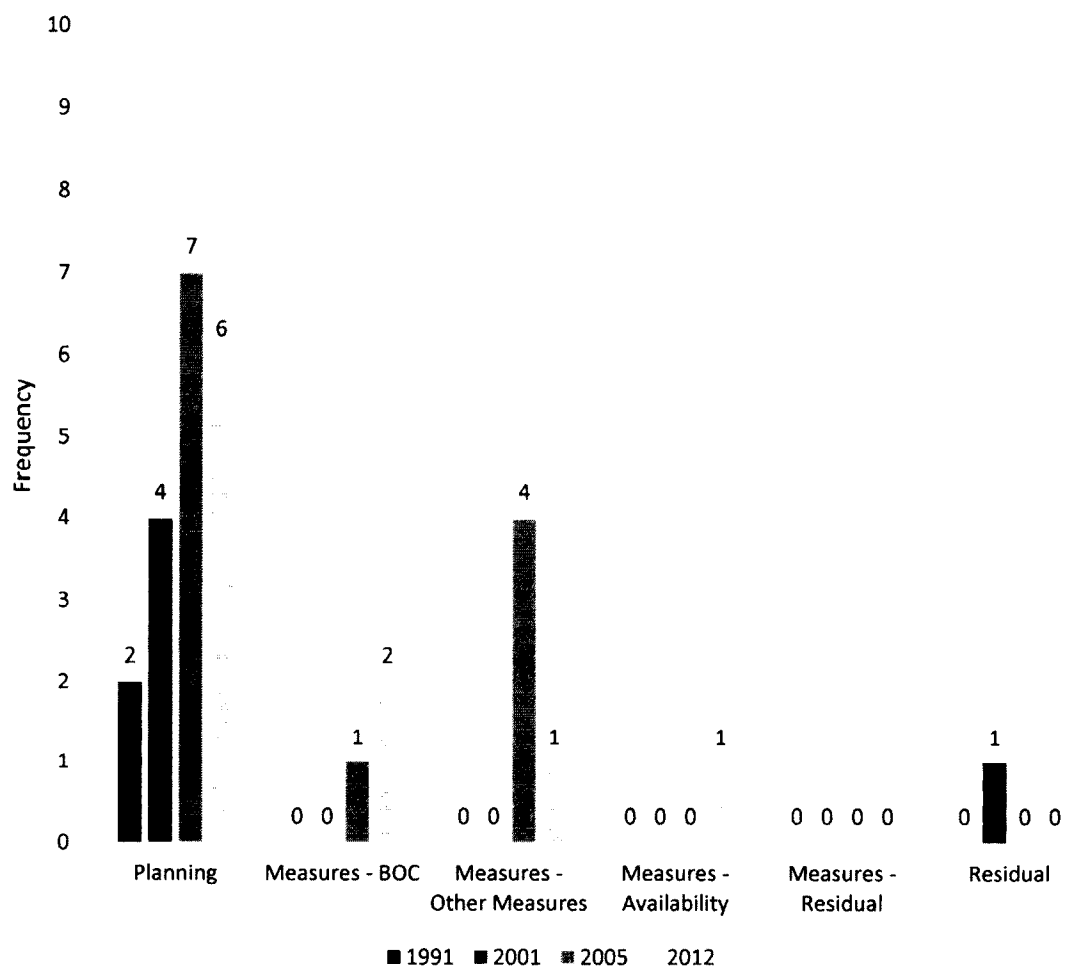
**Figure II.A.2: Category Frequency for CAAHEP (2001) Standards**

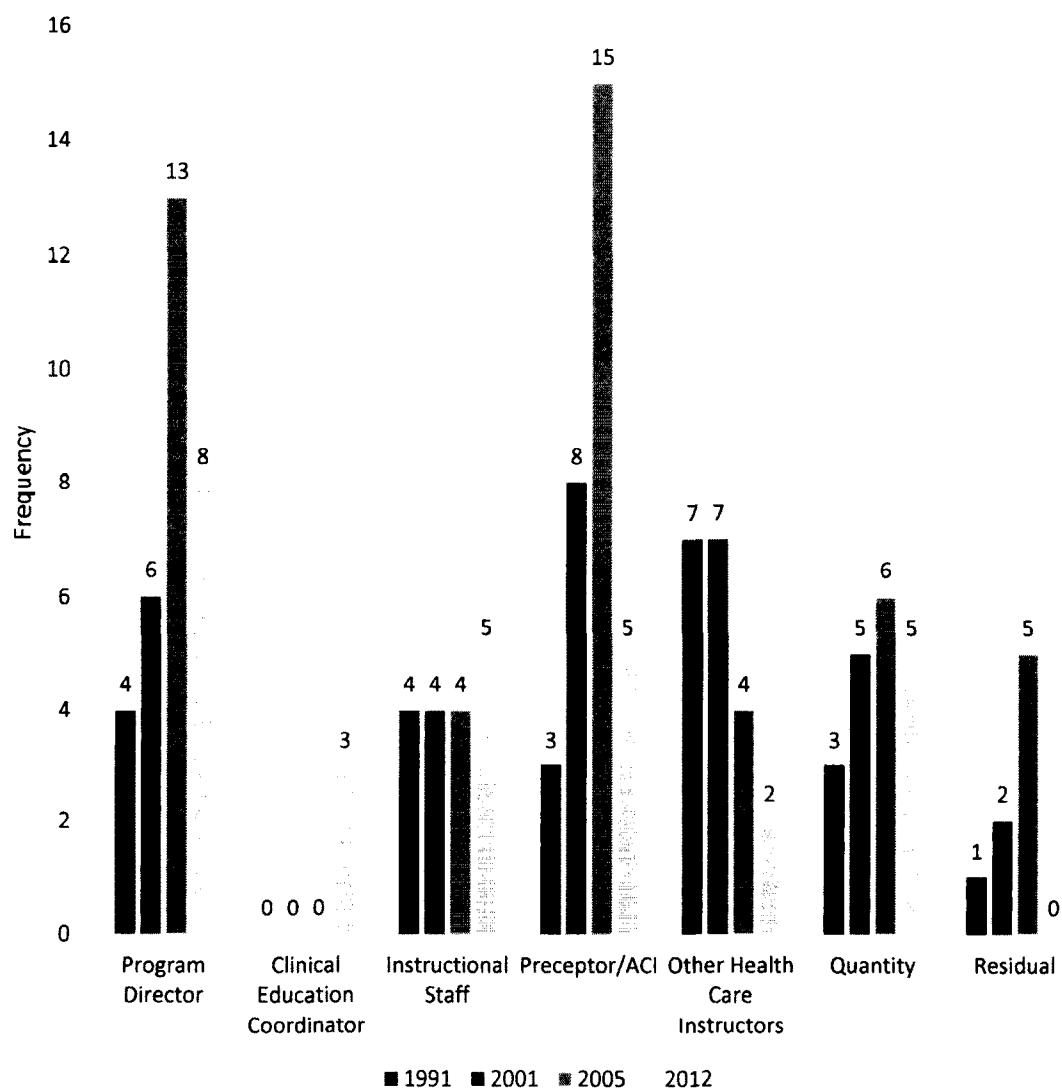


**Figure II.A.3: Category Frequency for CAATE (2005) Standards**

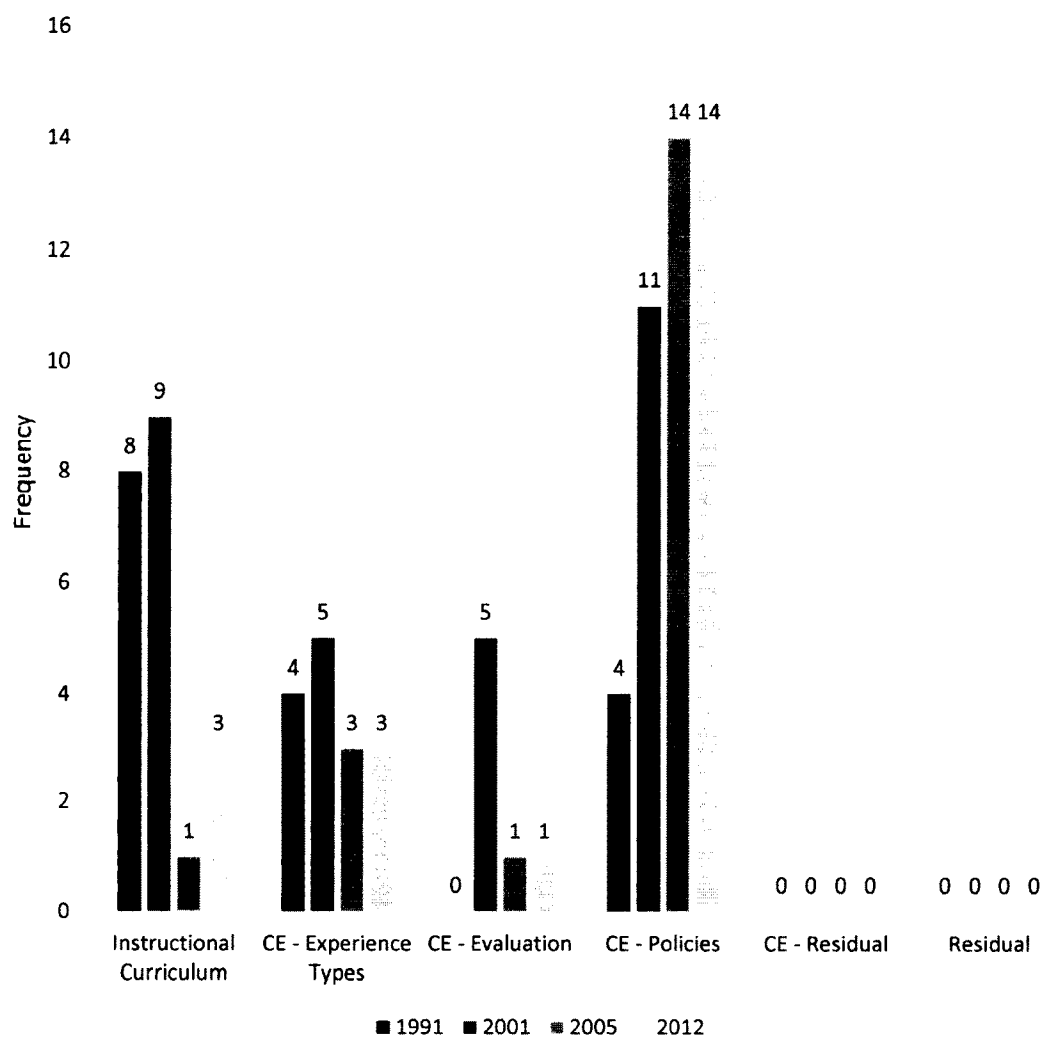
**Figure II.A.4: Category Frequency for CAATE (2012) Standards**

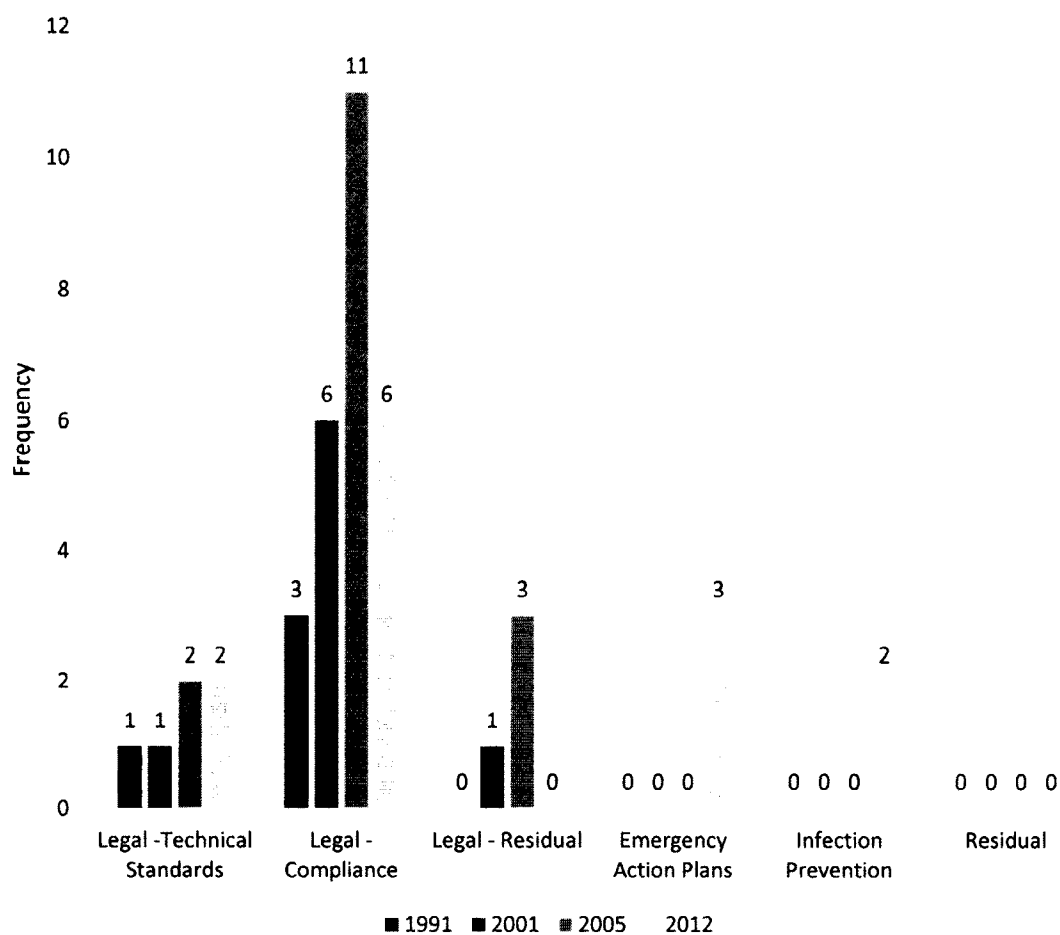
**Figure II.B.1: Sub-Category Frequency Sponsorship**

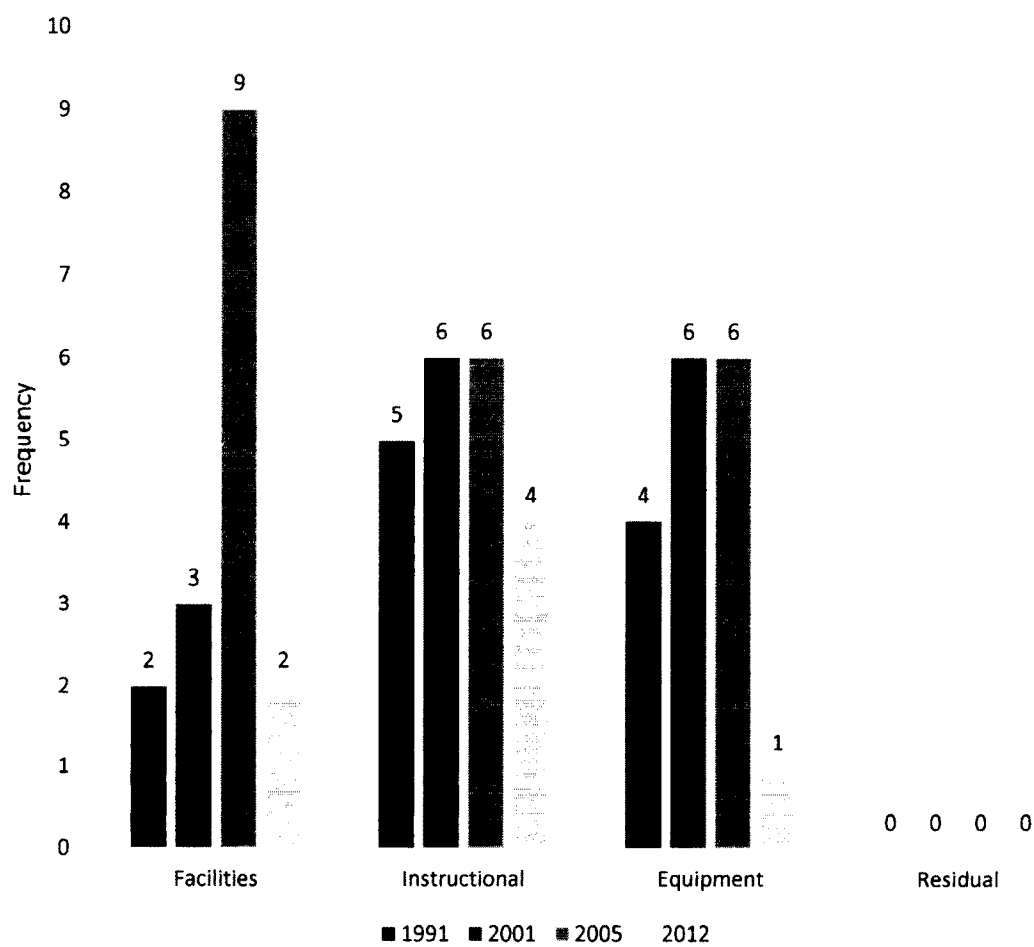
**Figure II.B.2: Sub-Category Frequency Outcomes**

**Figure II.B.3: Sub-Category Frequency Personnel**

**Figure II.B.4: Sub-Category Frequency Program Delivery.**

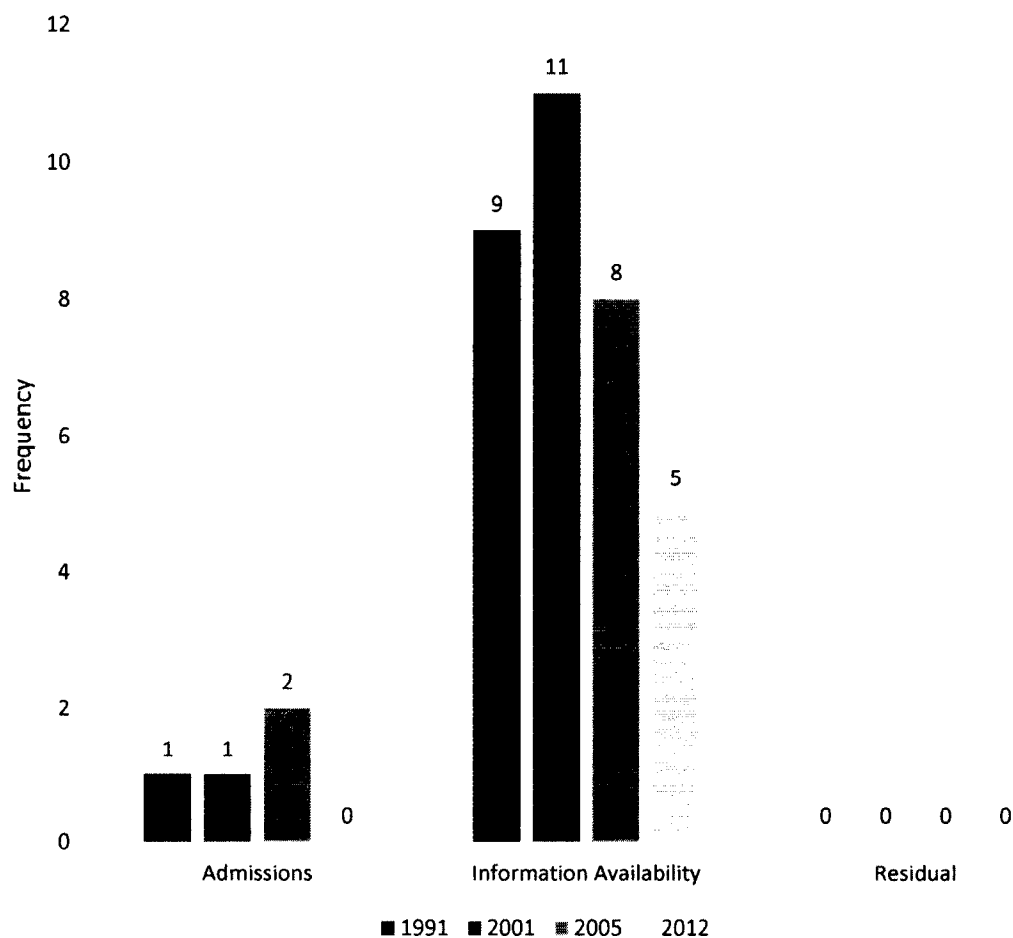


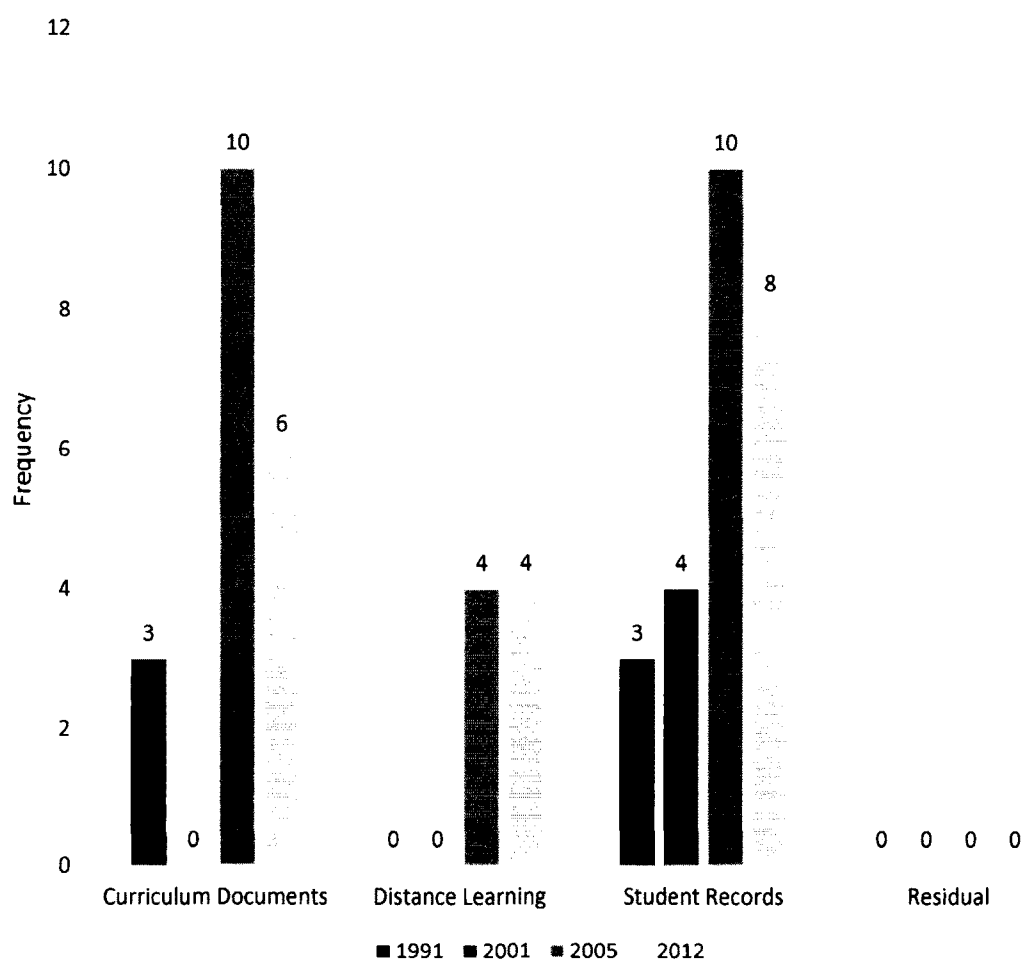
**Figure II.B.5: Sub-Category Frequency Health & Safety**

**Figure II.B.6: Sub-Category Frequency Resources.**

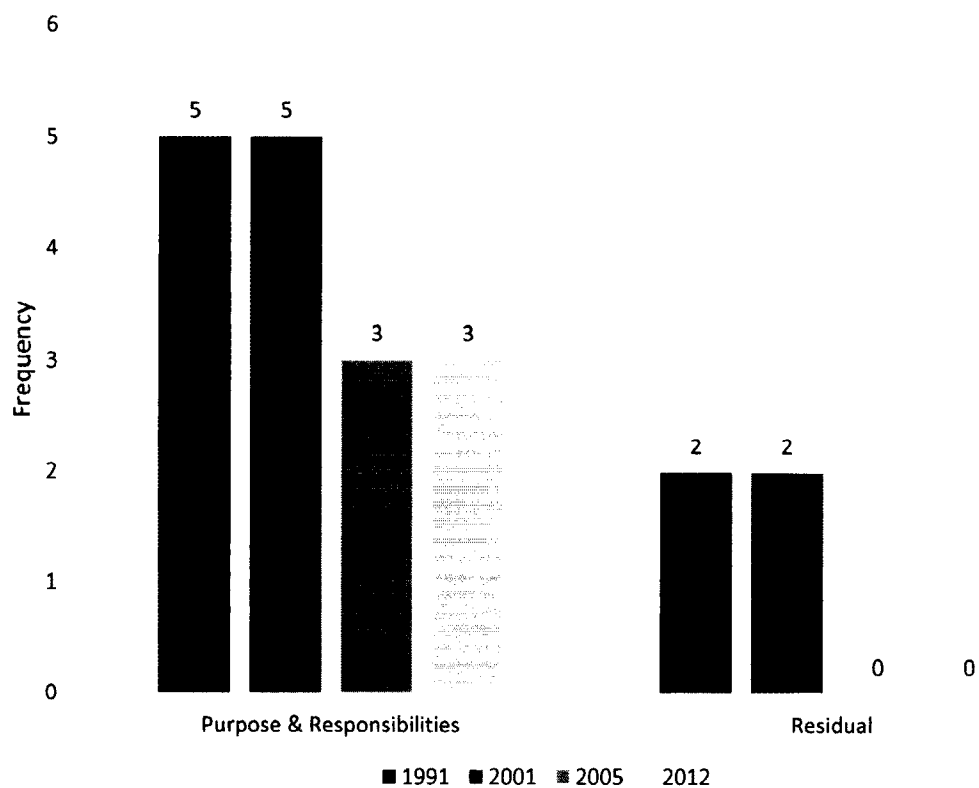


**Figure II.B.7: Sub-Category Frequency Operational Policies and Fair Practices.**



**Figure II.B.8: Sub-Category Frequency Program Description**

**Figure II.B.9: Sub-Category Frequency AT Accrediting Agency.**



### **CHAPTER III**

#### **Project I: Preparation of the Professional Athletic Trainer: A Descriptive Study of Undergraduate and Graduate Degree Programs**

Title: Preparation of the Professional Athletic Trainer: A Descriptive Study of  
Undergraduate and Graduate Degree Programs.

Authors: Julie Cavallario, Bonnie Van Lunen

Submitted to: Journal of Athletic Training, Epub Ahead of Print – March 20<sup>th</sup>, 2015

### Abstract

Context: The examination of the appropriate professional degree for preparation as an athletic trainer is currently of interest to the profession. Descriptive information is needed concerning universal outcomes in order to understand the impact of a degree change.

Objective: To obtain and compare descriptive information as it relates to professional athletic training programs and a potential degree change, and to determine if any of these factors contribute to success on existing universal outcome measures.

Design: Cross-sectional.

Setting: Online Survey.

Patients or Other Participants: 364 program directors contacted; 178 (51.4%) responded (163 undergraduate, 15 post-baccalaureate).

Intervention(s): The survey consisted of 46 questions around five themes: institutional demographics (13), program admissions (6), program outcomes (10), program design (9), faculty and staff (7), and one optional question.

Main Outcome Measure(s): Descriptive statistics for all programs were calculated; undergraduate and post-baccalaureate programs were compared by examining universal outcome variables.

Results: Descriptive statistics demonstrated that 33 programs could not currently support post-baccalaureate degrees and a significant loss of faculty could occur if the degree requirement changed (553 graduate assistants, 642 potentially under-qualified instructors). Post-baccalaureate professional programs had significantly higher 2011-

2012 first-time BOC pass rates ( $P < .05$ ), 3-year aggregate first time BOC pass rate ( $P < .05$ ), and employment rates for 2011-2012 graduates employed within the profession of athletic training ( $P < .05$ ). Linear multiple regressions models demonstrated that program and institution type contribute to the variance of the first-time BOC passing rate and the three-year aggregate first-time BOC passing rate ( $p < .05$ ).

Conclusions: Post-baccalaureate athletic training program students perform significantly better in universal outcome measures. The descriptive data collected supports the concerns that this transition could result in the loss of some programs, and additional immediate strain on current staff due to potential staffing changes and loss of graduate assistant positions.

Key Words: Athletic Training, Entry-Level Degree, Professional Education

## Introduction

Athletic training education is on the precipice of potential change. Based on the Future Directions in Athletic Training Education document released by the National Athletic Trainers' Association (NATA) Executive Committee for Education (ECE), a working group was directed to evaluate the most appropriate professional degree to ensure both the durability of the profession as well as continued improvement in patient outcomes.<sup>7</sup> The outcome of the working group resulted in a document which outlined some of the key findings associated with examination of a degree change.<sup>22</sup> Several recommendations were made following the review of findings and subsequent deliberations, and it was also documented that several effects of the degree change were considered during the development of the paper. Some of these considerations involved costs incurred by students for their education, work force related factors, and the degree level of faculty teaching within programs.

There is limited documented information concerning this topic<sup>1,2,18,25,51</sup> therefore discussions have been primarily guided by anecdotal information. The recent document<sup>2</sup> produced by the NATA ECE-working group is the first to elucidate on individual findings that are of interest to the profession. Additional data from the Commission on Accreditation of Athletic Training Education (CAATE) accredited programs would provide additional insight concerning objective information for decision making and analysis. The CAATE annual report is used to collect some information from programs; however the type of information being collected is still undergoing some change. Some of the compelling arguments in support of a transition to a post-baccalaureate professional degree include improved professional preparation of students, the ability to

select more highly qualified students, an increased likelihood of graduating students to remain in the profession, and aligning ourselves academically with peer health care professions.<sup>7,18</sup>

The primary purpose of this study was to obtain descriptive information about athletic training programs with professional degrees and compare outcomes between post-baccalaureate professional programs and matched undergraduate professional programs. Secondly, we examined which of these factors predict success rates for outcomes.

## Methods

### *Participants*

All 364 professional program directors were contacted via email, and 178 (51.4%) program directors (163 undergraduate and 15 post-baccalaureate) completed the entire survey. Additionally a case-control design was utilized following submission of surveys. Fifteen post-baccalaureate professional program survey respondents were matched with 15 undergraduate professional programs based on overall school size, centered on answers to questions regarding number of undergraduate and graduate students, and overall program anticipated class size (Table III.A.1). If more than one undergraduate professional institution matched the aforementioned criteria for a single post-baccalaureate professional program, then geographic location, based on NATA district, was utilized to determine the matching institution.

### *Survey Instrument*

The online survey was developed and delivered through Qualtrics online survey mechanism (Qualtrics, Provo, UT). The 2011-2012 Fact Sheet for Physical Therapist



## Education Programs from the Commission on Accreditation in Physical Therapy

Education<sup>52</sup> was utilized as a guiding mechanism to determine data collection themes after examining the data and outcomes that physical therapy programs report annually, as this report is published publicly. The survey was then constructed around five themes for data collection which included institutional demographics (13 questions), program admissions (6 questions), program outcomes (10 questions), program design (9 questions), and faculty and staff (7 questions). The instrument was distributed to three experts in athletic training education or athletic training education research who read the questions for wording and redundancy. Feedback was utilized to edit and refine the survey. The revised survey was sent to two additional experts who completed the survey, as well as provided feedback on content and wording. This feedback was utilized to finalize the survey instrument. No additional reliability assessment was completed. The final survey consisted of 46 questions, with some questions having follow-up questions displayed based on initial question response, and the final question being an optional question allowing the participant to identify their institution for the sole purpose of being removed from the reminder e-mail list. Sample questions for the survey instrument are located in Table III.A.2.

### *Procedures*

In winter of the 2012-2013 academic year the survey was e-mailed to the professional athletic training program directors that were identified through the CAATE website. Program directors were instructed to answer questions to the best of their ability. If programs were in the process of transitioning from professional baccalaureate to post-baccalaureate then they were asked to answer questions based on their current undergraduate status. Once the e-mail addresses were received for all the program

directors, an e-mail was sent containing the following items: (1) the purpose and importance of the research study, (2) a request for participation, (3) the estimated time to complete the survey, (4) the hyperlink to the survey Web page, (5) the date by which the survey should be completed, and (6) contact information for the researcher. Participants were given four weeks from the date of recruitment to complete the survey. Weekly follow-up e-mail reminders were sent which contained the same information as the initial e-mail. If a participant chose to answer the optional question identifying the institution then that individual's e-mail address was removed from the list and no additional reminders were sent.

### *Statistical Analysis*

Once the participant completed the survey (indicated by clicking "submit" on the final screen), the information was automatically sent to the university database system. Participant responses were generated in PASW Statistics (version 21.0; SPSS Inc., Chicago, IL). Descriptive statistics were used to calculate means, standard deviations, and frequencies. Descriptive data were not normally distributed therefore non-parametric tests were utilized where appropriate. Mann-Whitney *U* tests were used to compare all professional undergraduate and post-baccalaureate programs for graduation rate, 2011-2012 first-time Board of Certification (BOC) passing rate and overall BOC passing rate, three year aggregate first time BOC passing rate and overall BOC passing rate, and employment rate within Athletic Training. These outcome measures were evaluated due to the fact that they are the only objective universal outcome measurements currently available from all programs. Independent t-tests were utilized for the matched comparisons (15 undergraduate, 15 post-baccalaureate). Linear multiple regression was

used to analyze specific variables that contributed to success in the key outcome measurements of BOC passing rates, graduation rates, and employment rates. The  $\alpha$  level was set at  $P \leq 0.05$ .

### Results

Once responses were received, it was noted that for some of the open ended responses, in addition to answering the question asked, participants documented additional comments on the topic being investigated. Therefore, some of these questions were filtered for extraneous commentary and only the answers to the intended question were recorded. Descriptive statistics (mean  $\pm$  SD) for institution and program demographic information are presented for all completed surveys in Tables III.A.3 and III.A.4. For baccalaureate program respondents there were an average of  $3.5 \pm 5.2$  current graduate assistants, with a total sum of 553 graduate assistants. For post-baccalaureate respondents there was an average of  $2.87 \pm 3.7$  current graduate assistants, with a total sum of 43 graduate assistants. For the total reported 596 current graduate assistantships, 414 currently serve as preceptors within those programs. Within current baccalaureate program respondents there are an average of  $3.5 \pm 2.0$  instructors that possess a Master's degree, totaling 576 instructors. Within the post-baccalaureate respondents there were an average of  $3.2 \pm 2.9$  instructors that currently possess a Master's degree, totaling 49 instructors. In examining the institutional data there were 33 baccalaureate programs that responded that currently do not offer any graduate level degrees within the college/school/division of their institution with which they are affiliated. There were also 11 programs that responded that are currently housed within institutions that do not offer graduate degrees. Additionally, as the potential increase in educational costs was

identified as a concern regarding potential degree transition, program cost was calculated based on reported full-time tuition for undergraduate students. Survey respondents were asked to identify how tuition was calculated for both graduate and undergraduate tuition rates, and then subsequently asked to identify the specific tuition rate for their institution. If tuition was determined per credit hour and the per credit hour rate submitted, full-time cost was calculated based on a 12 credit hour per semester full time undergraduate student rate, and 9 credit hour per semester full time graduate student rate. If tuition was provided as a standard total amount for full time students, the submitted full time amount was utilized for analysis. Average cost for public and private programs was calculated for current four year degree cost, and then calculated with the reported full-time graduate tuition cost for a mean estimate of the cost of three year/two year programs and four year/two year programs respectively (Figure III.A.1).

Post-baccalaureate professional programs had a significantly higher 2011-2012 first-time BOC pass rates ( $U = 464.5$ ,  $p = .001$ ), and a significantly higher 3 year aggregate first time BOC pass rate ( $U = 451.5$ ,  $p = .001$ ) than undergraduate professional programs. Additionally post-baccalaureate professional programs had significantly higher employment rates for 2011-2012 graduates employed within the profession of athletic training ( $U = 614.0$ ,  $p = .010$ ). There were no significant differences between groups for graduation rate, the 2011-2012 overall BOC passing rates for all students taking the exam, or the three year aggregate BOC passing rate for all students taking the exam.

Linear multiple regressions were performed to assess predictors of the 2011-2012 first-time BOC passing rate percentage, the three year aggregate first-time BOC passing

rate percentage, and the 2011-2012 employment rate . The best fit significant models demonstrated that program type (post-baccalaureate) and institution type (Public) contributed to 5% of the variance of the 2011-2012 first-time BOC passing rate percentage ( $p = .004$ ), program type (post-baccalaureate) and institution type (Public) contributed to 10% of the variance for the three year aggregate first-time BOC passing rate percentage ( $p = .000$ ), and that program type (post-baccalaureate) and 2011-2012 overall BOC passing rate contributed to 20% of the variance of the 2011-2012 employment rate ( $p = .000$ ).

Descriptive data for the matched case-control groups are reported in Table III.A.5. Independent Samples T-tests were utilized to compare outcome measures between matched groups. In the case where Levene's test for homogeneity of variance was significant the adjusted p-value was utilized. The post-baccalaureate professional program group had significantly higher 2011-2012 first time BOC pass rates, [ $t(28) = -2.32, p = 0.035$ ] as well as a significantly higher employment rates within the AT profession [ $t(20.43) = -2.17, p = 0.042$ ]. A linear multiple regression indicated that group (post-baccalaureate) significantly predicted 13% of the variance on 2011-2012 first time BOC exam passing rate ( $p = 0.028$ ).

### Discussion

There have been many potential benefits and concerns that have been articulated regarding the potential change to a required post-baccalaureate degree in athletic training. While it is virtually impossible to measure the potential future professional effects this degree change could have, it is possible to review some of the results such a change

would have on existing athletic training programs as well as to compare the outcome measures of existing post-baccalaureate and undergraduate programs.

The outcomes of a degree change are difficult to measure in terms of significance; however, they are still visible within the descriptive data. The loss of graduate assistant positions is potentially one of the most discussed consequences related to a degree change.<sup>1,4</sup> The effects of the loss of these positions reach beyond athletic training programs. Many institutions utilize graduate assistant positions to supplement clinical athletic training staff even without the existence of an educational program. Graduate assistants also often serve as preceptors within programs, thus impacting student to preceptor ratios if these positions are eliminated. The loss of fully or partially funded graduate assistant positions with the increased educational degree requirement will result in students having an increased financial obligation with regard to their education.<sup>1,4</sup> Our findings suggest that at least 553 graduate assistant positions (~50% of programs reporting) would cease to exist within institutions which support an athletic training program, and this data does not account for the many other institutions that do not currently contain athletic training programs that will also no longer have the ability to hire graduate assistants in the traditionally accepted definition of this role. This has a great potential impact on patient care as well as workload for current staff members. It is possible that the current graduate assistant positions could be transitioned to intern positions allowing students to still obtain additional professional experience following degree completion, and alleviating some of the strain on program staff with the loss of graduate assistant positions. However, this shift may cause additional concerns relating to the role of an intern. Graduate assistants are restricted in the number of hours they can

work, while interns have no restrictions to follow. Consequentially, institutions may merely transition graduate assistantship funds into intern positions, therefore the salary amounts associated with these positions will not match the workload required, nor the degree level achieved. Additionally, based on our results, 388 of those reported graduate assistants currently serve as preceptors within the professional programs resulting in a potential impact on student clinical and classroom experiences. It is possible that the loss of these positions could result in a greater financial impact on students, as the majority of graduate assistant positions offer some financial incentive for students attempting to complete a post-baccalaureate degree. If the transition is made students will be responsible for the total financial burden of the higher level degree, and will be graduating without any experience as a professional athletic trainer. It is important to consider that while the potential costs to the student may increase, there are subsequent effects that could positively impact the athletic training profession as a whole. This could result in a greater demand for post-professional or residency programs to supplement the entry-level athletic trainer's professional experience. The loss of traditional graduate assistant positions could also result in an increase in job availability for athletic trainers, as many institutions who currently utilize graduate assistants could be replacing those positions with staff positions.

One of the primary concerns of this potential degree transition would be the impact on faculty and programs that cannot support a post-baccalaureate degree at their institution. The inability of the institution to support this transition would likely be due to the fact that either the institution does not offer post-baccalaureate degrees, or the school in which the program is housed does not offer post-baccalaureate degrees. There is also

a potential lack of qualified instructional faculty within the field, as some institutions will require that instructors hold a degree level above the degree of the program in which students are enrolled. This could also result in job loss or displacement for those who are no longer considered qualified to instruct within their programs.<sup>4</sup> With regard to institutional capability to support programs, of the institutions reporting information for this survey, there are at least 11 athletic training programs at institutions that do not currently offer post-baccalaureate degrees, and at least an additional 33 athletic training programs who currently cannot offer post-baccalaureate degrees in their current school/division/college. This could ultimately result in the loss of some existing athletic training programs and subsequent displacement of instructional staff unless institutions seek out the ability to offer such degrees. Additionally, there are at least 66 instructors that currently hold a Bachelor's Degree, and at least 576 that currently hold a Master's Degree. Dependent on institutional policy, some of these instructors may be unable to continue instruction within a program for a post-baccalaureate degree resulting in additional displacement of current faculty members, and possibly a lack of qualified teaching faculty currently holding a terminal degree. These are important considerations for the potential transition, especially with regard to the timeline to implementation of a degree change. As other professions have made a professional degree change, the accrediting body afforded ample time for programs to align with the requirements without imposing penalties.<sup>10</sup>

Standardized outcomes related to baccalaureate and post-baccalaureate professional athletic training programs include results regarding the BOC examination. Some research has shown that performance on the BOC examination, with regard to



passing rates, is higher among graduates of existing post-baccalaureate programs.<sup>2</sup> Our findings demonstrate a difference in some of the outcome measures, specifically first-time BOC exam passing rate and employment rate of graduates within the profession of athletic training. While post-baccalaureate programs did show a significantly better rate for both outcomes, there was no significant effect when examining overall BOC exam passing rates. It is important to note that even when significant differences did exist, as was the case for first time BOC passing rate, the mean scores for both types of programs were both above the 70% rate required by the CAATE Standards. Interestingly, institution type (public vs. private) was also indicative of first time BOC exam success. As was previously reported, 5% of the variance in first time BOC passing rate, and 10 % of the variance in the 3 year aggregate first time passing rate can be attributed to the student graduating from a public, post-baccalaureate program. These contributions were significant however; there is still a large percentage of the BOC exam data variance that isn't explained by the type of institution or type of program that still could be investigated. Ultimately passing of the BOC exam and subsequent employment within the AT profession are vital to the success of the profession as a whole, thus this data should be examined as a degree change is discussed.

Current degree credit restrictions and general education requirements limit the amount of focused time current undergraduate programs can spend on developing critical thinking skills that require the student to implement clinical proficiency skills with theory and research based decision making to create a prospective treatment plan.<sup>53</sup> It is believed that that such critical thinking is more easily fostered at the graduate school level due to the ability to focus curriculum solely on professional education, thus

improving the professional preparation of athletic training students.<sup>18,53</sup> Additionally, certain institutions currently have credit restrictions that limit the number of required credits within a major. These institutions may have difficulty incorporating the increases in the knowledge, skills and abilities required within the professional competencies under the existing credit restriction; a problem that is less prevalent at the post-baccalaureate level.<sup>18</sup> As seen in Table 3, there were 84 responding baccalaureate institutions (47%) that have an existing credit restriction, with an average credit cap of  $94.3 \pm 34.7$ , so there is evidence that the credit restriction could be a limitation that baccalaureate athletic training programs are facing.

It has also been reported that undergraduate professional programs have difficulty recruiting and retaining students that are committed to remaining within the profession following graduation; a problem that is less prevalent at the graduate level.<sup>54,55</sup> Graduate school admission requirements are typically more stringent than undergraduate or individual athletic training program requirements, therefore resulting in a higher quality student at the initiation of professional education.<sup>5</sup> Furthermore, other healthcare professions with whom athletic training is compared, primarily physical therapy, have moved to a post-baccalaureate entry level degree requirement. This could possibly effect the perception of athletic training as a well-educated healthcare profession by comparison.<sup>18</sup> Other healthcare professions are labeled as “health diagnosing and treating practitioners” whereas athletic trainers are designated as “health technologists and technicians” by the US Bureau of Labor Statistics Standard Occupational Classification (SOC) System.<sup>56</sup> This implies that athletic trainers are not prepared to diagnose and treat as autonomous practitioners. It is postulated that the transition of the entry-level degree

could result in the change of the classification of the athletic training profession within the SOC system, resulting in greater recognition from peer healthcare providers as well as potential longer reaching effects on billing and reimbursement issues that the profession faces. However, there is no existing evidence that demonstrates that the change in education will result in improved patient outcomes or greater “peer” recognition, so this theory is primarily anecdotal in nature.<sup>18</sup>

As a peer health profession many of the discussions regarding education of health professionals revolves around the comparison of Athletic Training to Physical Therapy. Physical Therapy outlined similar goals for the profession, primarily the increased ability to practice autonomously, as it transitioned from a baccalaureate entry-level degree into post-baccalaureate degrees at the Masters and Doctoral levels. The rationale for these changes was primarily based on the increasing scope of practice of the profession, and greater practice autonomy.<sup>57</sup> Additionally, while physical therapy did not evaluate patient outcomes prior to designating a degree change it has been documented that requiring an advanced degree did result in a greater implementation of evidence-based practice.<sup>58</sup> Physical therapy also faced similar concerns when addressing the potential degree changes as well; namely the concern regarding the true need for an increase in degree requirements, the inability to predict the suggested advantages of a degree change, and the potential increase in the public’s confused perception of the education of the profession.<sup>57</sup> There were no studies performed during this transition that accurately measured and addressed any of the concerns or goals that related to the degree change, and despite resistance to the change over many years, the transition was ultimately decided upon and successfully implemented.<sup>57</sup>

### Limitations and Suggestions for Future Research

The descriptive information collected for the current study included information that was readily available for the program directors to input into the online survey. Specifically with regard to the anecdotal concern regarding the potential increase in tuition cost; it would be very difficult to evaluate the current cost to each student, especially considering the variance in types of funding available through current assistantships, fellowships, and scholarship opportunities. There are likely to be other institutional and program components that could be evaluated in future studies. Furthermore, the creation and implementation of quantifiable outcome measurements other than BOC exam results, graduation rates, and employment rates, could allow for greater comparison between programs. The CAATE and the BOC need to assume an instrumental role in the collection and dissemination of programmatic data, as they serve as the gatekeepers for data input.

Moreover, no information is available related to the effects of degree change on patient outcomes, although based on the literature, this was not evaluated prior to the degree change in physical therapy, or other transitioning health related professions.<sup>57</sup> Future research should also examine whether or not patient outcomes are affected by proposed changes in the educational requirements of athletic trainers.

### Conclusions

There are many anecdotal potential benefits and concerns regarding the investigation into what ultimately should be the entry-level degree for the athletic training profession. This study demonstrates that current post-baccalaureate athletic training programs perform significantly better in some key outcome measures; however, the

descriptive data collected supports the concerns that this transition could result in the loss of some programs which cannot currently support a post-baccalaureate degree, and may cause additional strain on current staff due to potential staffing changes and loss of graduate assistant positions. The degree change could also result in additional job opportunities within the collegiate setting, as the vacated graduate assistant positions would need to be addressed by the administration in order to provide appropriate medical care.

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**Table III.A.1: Case-Control group Demographics**

Group	Public	Private	Institution Size (Mean $\pm$ SD)	AT Cohort Size (Mean $\pm$ SD)
Undergraduate	8	7	13,104 $\pm$ 12,809	17 $\pm$ 6
Graduate	8	7	13,969 $\pm$ 12,847	17 $\pm$ 6



**Table III.A.2: Sample of Survey Questions**

14. How are students admitted to your AT program?
15. What is your planned/anticipated incoming accepted class size for the 2013-2014 academic year?
16. How many applicants to the AT Program did you have for the 2012-2013 academic year?
17. How many of the applicants from the 2012-2013 applicant pool met the program qualifications?
18. How many of the applicants were offered acceptance into the AT Program for the 2012-2013 school year?
19. Of the 2012-2013 applicants offered admittance to the AT Program, how many applicants accepted the offer?
20. What degree are the students awarded upon completion of the AT Program?
21. How many students graduated from your AT Program in the 2011-2012 academic year?
22. What is your AT program's graduation rate for the 2011-2012 academic year?
23. In the 2011-2012 academic year what was your AT Program's first-time pass rate of the BOC Certification exam?
24. What is your AT Program's current 3-year aggregate first-time pass rate for the BOC Certification exam?
25. For the 2011-2012 academic year what was your overall pass rate for all students who took the BOC Certification exam?
26. What is your AT Program's current 3-year aggregate overall pass rate for all students who took the BOC certification exam?
27. For the graduating class of 2011-2012 what was your employment rate for graduates employed within at athletic training setting?
28. Which of the following assessment measures are currently utilized by your AT Program as program outcome measures?
29. What other, if any, unique metrics are currently utilized by your AT Program?

**Table III.A.3: Descriptive Program Data by Program Type**

	UG (Mean $\pm$ SD)	UG Range	UG Sum	GR (Mean $\pm$ SD)	GR Range	GR Sum
<b>Program Admissions Data</b>						
Anticipated Class Size	17.5 $\pm$ 8.7	4–60	2818	17.3 $\pm$ 5.8	10–30	260
2012-2013 applicants	34.3 $\pm$ 65.4	5 –690	5494	58.9 $\pm$ 34.5	25–150	824
2012-2013 qualified applicants	20.3 $\pm$ 13.9	2–90	3151	37.7 $\pm$ 18.1	18–85	528
2012-2013 offered admittance	18.4 $\pm$ 20.6	2–220	2863	26.4 $\pm$ 18.0	13–85	369
2012-2013 accepted admittance	15.7 $\pm$ 9.2	2–58	2443	15.8 $\pm$ 5.6	7–25	221
<b>Program Outcomes</b>						
Number of 2011-2012 graduates	10.6 $\pm$ 6.5	1–45	1733	11.1 $\pm$ 5.2	3–20	167
Percentage of 2011-2012 graduates	93.0 $\pm$ 16.7	3–100		95.9 $\pm$ 7.9	79–100	
2011-2012 first time BOC pass rate (%)	83.5 $\pm$ 19.9	16–100		98.9 $\pm$ 2.4	93–100	
3-year aggregate first time BOC pass rate (%)	76.6 $\pm$ 18.3	13–100		91.4 $\pm$ 8.7	75–100	
2011-2012 overall BOC pass rate (%)	94.2 $\pm$ 11.7	40–100		98.5 $\pm$ 3.8	86–100	
3-year aggregate overall BOC pass rate (%)	92.6 $\pm$ 11.0	50–100		95.5 $\pm$ 6.9	80–100	
2011-2012 Employment in AT Profession (%)	81.4 $\pm$ 22.4	10–100		96.4 $\pm$ 9.1	66–100	
<b>Program Design Data</b>						
Typical Length of Program (years)	2.9 $\pm$ .5	2–4		2.3 $\pm$ .8	2–5	
Has institution maximum credit cap			84			6

Institution max credit cap (when applicable)	94.3 ± 34.7	16–165		85.0 ± 39.4	36–120	
Required AT credit hours	76.0 ± 23.6	13–129		56.9 ± 9.4	42–70	
Has a minimum clinical hour policy			116			11
Minimum clinical hour amount	905.5 ± 293.4	32–1800		1067.3 ± 210.0	800–1400	
Has a maximum clinical hour policy			50			5
Maximum clinical hour amount	1660.4 ± 527.6	750–3000		2011.0 ± 296.4	1600–2400	

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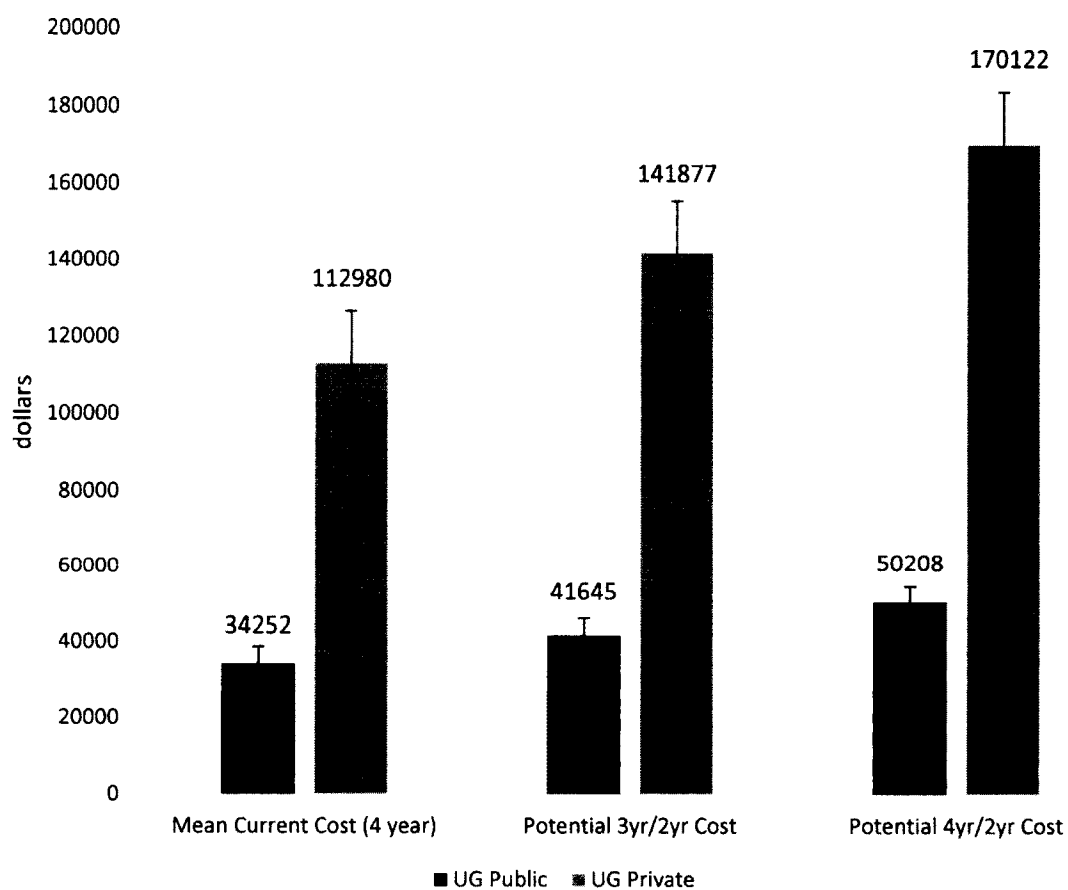
**Table III.A.4: Descriptive Faculty and Institution Data by Program Type**

	UG (Mean $\pm$ SD)	UG Range	UG Sum	GR (Mean $\pm$ SD)	GR Range	GR Sum
<b>Faculty</b>						
Number of dual appointment staff per program	5.2 $\pm$ 2.8	1–18	849	5.6 $\pm$ 3.3	2–16	84
Number of instructors with Bachelors as highest degree obtained	0.4 $\pm$ 1.2	0–8	66	0.3 $\pm$ 1.0	0–4	5
Number of instructors with Master's as highest degree obtained	3.5 $\pm$ 2.0	0–13	576	3.2 $\pm$ 2.9	0–11	49
Number of instructors with a terminal degree as highest degree obtained	1.6 $\pm$ 1.4	0–6	260	2.6 $\pm$ 1.3	1–5	39
Number of graduate assistants per institution	3.5 $\pm$ 5.2	0–32	553	2.87 $\pm$ 3.7	0–13	43
Number of graduate assistants that also serve as preceptors	3.7 $\pm$ 3.3	0–15	388	2.6 $\pm$ 2.3	0–8	26
<b>Institution Data</b>						
Number of Institutions that DO NOT have a division/college/school of health professions			62			2
Number of AT programs that are housed in a division/college/school that DO NOT currently offer a Master's degree			33			
Number of Institutions that DO NOT currently offer Master's degree			11			

**Table III.A.5: Case-Control Descriptive Information**

	Undergraduate Group	Graduate Group
Number of graduates	11.27 ± 6.49	11.12 ± 5.18
Graduation rate (%)	92.14 ± 15.39	95.86 ± 7.93
Last year first time BOC pass rate (%)	91.20 ± 12.56	98.87 ± 2.39
Last year overall BOC pass rate (%)	96.21 ± 7.70	98.47 ± 3.80
3-yr aggregate first time BOC pass rate (%)	82.47 ± 17.96	91.40 ± 8.72
3-yr aggregate overall BOC pass rate (%)	98.29 ± 3.32	95.53 ± 6.87
Employment rate within AT profession (%)	85.86 ± 15.87	96.40 ± 9.12

**Figure III.A.1: Potential Cost of Degree Change for Current Undergraduate Students**



## **CHAPTER IV**

### **Project II: Experiences of Clinical Education Coordinators in Selecting Clinical Education Experiences within the Confines of the Accreditation Standard: A Qualitative Study.**

Title: Experiences of Clinical Education Coordinators In Selecting Clinical Education Experiences Within the Confines of the Accreditation Standard: A Qualitative Study.

Authors: Julie Cavallario, Bonnie Van Lunen, Sarah Manspeaker

Submitted to: Journal of Athletic Training- JAT0121-15

### Abstract

#### **Experiences of Clinical Education Coordinators in Selecting Clinical Education**

#### **Experiences within the Confines of the Accreditation Standard: A Qualitative Study**

Context: There is a gap in available information regarding the role of the existing accreditation standard and how it affects the Clinical Education Coordinator's (CEC) role during in placing students in effective and productive clinical education experiences.

Objective: To explore the methods in determining AT student clinical placement in professional AT programs, to understand the process utilized by the CEC to determine placements, and how the accreditation standards influence those methods.

Design: Qualitative interviews of emergent design with phenomenology

Setting: Graduate level CAATE-accredited AT programs

Patients or Other Participants: Seven CECs with three or more years of experience

Data Collection and Analysis: Phone interviews were conducted to determine the experience of and the methods used by CECs when determining clinical education placements for students within their AT program. Subsequent to member checking, interviews were explored qualitatively and etic coded. Triangulation was achieved through the use of an independent peer coder, followed by comparative pattern analysis in a consensual coding process.

Results: CECs identified four main themes that guided their methods for clinical education experience selection: Influences on placements, Challenges to placements, Requests for placements, and Suggestions to Standards on placements. Several categories and sub-categories were further identified within each of these themes.



Conclusions: Standard fulfillment will continue to be a major influence on clinical education experience placements, and should impact how future Standards are written to allow CECs the flexibility to select experiences based on the best interest of the student. Student requests should be considered on a limited basis to benefit the student preparation for professional practice. Program personnel should examine curriculum structure to consider allowing students immersive clinical education experiences.

Key Words: Clinical Education, Accreditation Standards, Students

### Introduction

Within the professional education process in athletic training (AT), students are assigned to a variety of clinical experiences during which the students are expected to incorporate the clinical skills that are taught in the didactic portion of the program via supervised hands-on participation.<sup>1</sup> The Commission on Accreditation in Athletic Training Education (CAATE) creates the standards for all professional athletic training programs, including a standard regarding guidelines for clinical experience assignments.<sup>2</sup> The current standard regarding clinical education placements for an athletic training student states:

Students must gain clinical education experiences that address the continuum of care that would prepare a student to function in a variety of settings with patients engaged in a range of activities with conditions described in athletic training knowledge, skills and clinical abilities, *Role Delineation Study/Practice Analysis* and standards of practice delineated for an athletic trainer in the profession. Examples of clinical experiences must include, but should not be limited to: Individual and team sports; Sports requiring protective equipment (e.g., helmet and shoulder pads); Patients of different sexes; Non-sport patient populations (e.g., outpatient clinic, emergency room, primary care office, industrial, performing arts, military); A variety of conditions other than orthopedics (e.g., primary care, internal medicine, dermatology).<sup>2</sup>

Athletic training programs are expected to minimally meet this standard, but are also given the autonomy to institute additional requirements of enrolled students. The Clinical Education Coordinator (CEC) is the faculty member responsible for determining the student clinical experience placements, as well as monitoring these students' experiences throughout the course of enrollment in the AT Program. Ideally the CEC has the ability to select the clinical education experience that is the best fit for the students'

educational needs and career goals, as well as provide a meaningful use of students' time in what is intended to be an educational setting.

Athletic training as a healthcare profession has a seemingly high rate of turnover in its students that choose to continue in the profession in comparison to those who graduate from AT programs.<sup>3</sup> Some frustrations that students report during clinical education include not being allowed to fully participate in patient care, not being part of daily patient care,<sup>4</sup> as well as the feeling that the accumulation of hours as a requirement did not result in quality hours of education.<sup>5,6</sup> As the clinical education experience has been identified as one of the main reasons why students choose another profession, it is essential to not only identify what components result in a successful clinical experience,<sup>6-8</sup> but then also to identify whether or not CEC's have the capability and support to facilitate successful experiences for students.

There is currently no published research in the field of athletic training that examines the role of the CEC and how their decisions impact student clinical education. Additionally, there is a gap in available information regarding the role of the existing accreditation standard and how it affects the CECs' duty in placing students in effective and productive clinical educational experiences. The purpose of this study was to explore the methods behind AT student clinical placement in professional AT Programs, to understand the process utilized by the CEC to determine clinical placement, as well as ascertain how the accreditation standards influence those methods.

## Methods

### *Design*

This emergent, phenomenological study was conducted utilizing a social constructivist paradigm, and ascertained the participants' (clinical education coordinators) perception and experience utilizing the current CAATE standard to guide the placements of students within clinical rotations. Phenomenology is a qualitative tradition that proposes a shared essence within a given experience from its participants.<sup>9</sup> The design of this study also borrowed from consensual qualitative research tradition (CQR) which provides an in-depth, descriptive analysis of the participant's experience in which the phenomenon occurs. Additionally CQR allows for the researcher to reflect on their own experiences when creating interview questions.<sup>10</sup> The primary researcher (JC) has previously held the title of clinical education coordinator in a professional AT Program, and has been responsible for assigning students in their clinical education experience. These previous experiences, methods, and goals were considered when creating the interview protocol; responses were reviewed and the resulting data coded through the social constructivist lens of knowing and understanding the process that other CEC's experience.<sup>11</sup> Approval for this study was obtained from the Human Subjects' Committee within the Darden College of Education at Old Dominion University.

### *Participants*

Criterion-based, purposeful sampling was utilized to ensure that results could be generalized over the specific, targeted population of CECs. The predetermined criteria for participant selection included that each CEC was, (a) a CEC at a CAATE-accredited post-baccalaureate professional AT Program, (b) responsible for assigning student clinical education experiences within the AT Program, and (c) employed at the CEC position for a minimum of three years. The first criteria was determined based on the

potential for professional education for athletic trainers to be exclusively provided at the post-baccalaureate level in the future, thus ensuring findings would continue to be applicable to this type of educator. The third criteria was included because the CAATE standard requires that clinical coursework spans a two-year minimum time period, thus this criteria ensured that the participant had been responsible for assigning clinical education experiences for at least one cohort's entire experience at the institution. Participants were contacted via email and asked to participate in the study, and upon agreement a time for a phone interview was determined. Agreement to participate in the study was accepted as informed consent. The day prior to the interview the participant was sent an email containing the exact wording of the aforementioned CAATE standard that was to be included and referred to within the interview protocol. The participants were instructed to review the standard and have it available for reference during the interview on the following day.

All of the nationally available ( $N = 34$ ) potential participants were contacted. Initially six participants were interviewed however, due to a corrupted recording device, these six interviews were lost. The remaining 28 recruited participants were re-contacted and seven additional subjects (20.5%) were interviewed. Additional participants were not recruited due to the attainment of data saturation as determined by the researchers. Descriptive data of the included participants can be found in Table IV.A.1.

### *Interview Protocol*

The semi-structured interview process allowed the researchers to identify the main methods and goals that the CEC utilized in placing students within clinical education experiences, as well as what the CEC perceived as the most important criteria

when making these decisions. In consistency with the CQR approach,<sup>10</sup> the interview was constructed of multiple open-response questions about the participant's methods, goals, opinions, and perceived barriers of student clinical placement within the confines of the CAATE standard. The emergent design of this interview protocol allowed for the flexibility to ask for further clarification or delve into previously unintended topics of interest as the participants' answers warranted.<sup>12</sup>

The interview protocol was created and then reviewed by an expert in qualitative research design for thoroughness of content and clarity of wording. Minor changes were made, and then the protocol was reviewed for clarity and ease of understanding by three additional AT educators; a CEC, a post-professional athletic training faculty member, and a post-professional program director; no additional changes were made. A copy of the interview protocol is included in Table IV.A.2.

#### *Data Collection and Coding*

Immediately upon completion of the interviews, word-for-word transcription was completed by the lead researcher. Member-check was performed in which each participant was emailed a copy of the interview transcript to review. During this process the participants were encouraged to clarify any statements, or add additional comments or information to assist in clarifying responses. Only two participants returned their transcripts with comments; only one of those requested changes to the existing transcript. This change was grammatical in nature, and did not change the content of the transcript.

Transcripts were reviewed multiple times while adding field notes to identify preliminary descriptive summaries. Additional reviews of the transcripts were done to etic code the data and identify textual themes. Etic coding implies that coding was

approached from the perspective of existing concepts and perspectives, and involves descriptions expressed in terms of existing meaningful categories.<sup>10</sup> As these interviews were conducted and analyzed with reference to methods and perspective that occurred both within and outside of the confines of the accreditation standard, etic coding was selected. Triangulation was achieved through the use of an additional researcher who coded the data independently of the primary researcher's findings. Initial codes were then reviewed through comparative pattern analysis and ultimately re-grouped to form higher order categories with sub-categories throughout following a consensual coding process.<sup>10</sup>

### Results

Four themes and several supporting categories and sub-themes within each theme emerged from the interviews (Figure IV.A.1). The four themes include 1) Influences on placements, 2) Challenges to placements, 3) Requests for placements, and 4) Suggestions to Standards on placements. The supporting categories grouped within these themes contribute to the overarching primary considerations or challenges to determining clinical placements.

#### **Influences on placement**

Participants were asked about the goals, considerations, and methods for selecting students clinical experience placements. The requirements set forth from the accreditation standard as the primary guiding factor for placement selection were consistently discussed. Many participants also identified other factors that were not contained within accreditation Standards that significantly influenced their decisions for student clinical placement. The first category within this theme was *Influenced by Standard*, with sub-categories including Standard fulfillment, General medical fulfillment, Preparation for

professional practice fulfillment. The second category within this theme was *Not influenced by the Standard*, with sub-categories including Best interest of the student, Matching with Preceptor, Unique options to the program, and Availability of placements.

**Influenced by the Standard. *Standard fulfillment.*** When describing the method utilized to select student clinical experience placements, the participants frequently discussed the need to fulfill the required experiences before bringing other considerations into the process. Participants elaborated that this process was not difficult, but that it needs to be a priority despite options that are available.

*We do go forth off the checklist. You know, what is the preceptor's main qualification and what coverage are they identified with? What type of sport is this? Is this male versus female? What type of equipment? How often are they with the patient flow? Are there clinics there? What type of physicians are they addressing? Are they coming into the clinic?... So all of this information is given to us, or given to me as the coordinator here for this particular program, so I extract all of the data and I have that when I am placing students, it's so comprehensive. -Quinn*

Jake noted that “We have a matrix that we use, and in that the students have to get basically one of each of those categories. All of the students at some point in their careers are assigned football for the helmet and shoulder pad protective equipment requirement.” Universally, it became apparent that by creating a basic process by which students are placed in their early clinical education experiences, the Standard could be attained more easily.



*The one thing about that first experience is that for all of our students, they will have an equipment intensive experience as their very first rotation, whether that's at a college or at a high school. Then during the spring that student will actually go from a high school to a college, or from a college to a high school basically just to get the different patient population. -Harrison*

The use of a matrix or spreadsheet was a common method by which CEC's tracked and rotated student clinical placements to ensure standard fulfillment. This tool was identified in the earlier quote from Jake in describing how he meets the individual components of the Standard, and Abby stated that, "I basically have a spreadsheet where I keep track of their sites, and then within that spreadsheet it also lists whether it was equipment intensive, with men or women, or you know, a therapy clinic or hospital."

Whereas Cyrus did not use a matrix, his process similarly attempted to meet the requirements set forth in the standard:

*We have four semesters since we are a Master's program of course, so we have a full semester at a high school, and one of the first things that I do is, half of the new applicants, I try to see if I can get them to the high school first because it meets the bulk of these right here.*

*General medical fulfillment.* While a component of Standard fulfillment encompasses general medical experiences, many of the CECs that were interviewed outlined a specific process that they followed in order to guarantee general medical exposure outside of their traditional clinical education placements. For example, Harrison explained, "In terms of students being exposed to general medical conditions and, you know, non-traditional athletic patient populations our students actually do mini

rotations with our medical director in his medical office.” In comparison, Olivia builds the general medical component of this standard into a clinical rotation that runs simultaneously along with the didactic general medical class:

*They have the opportunity to work one-on-one with a general medical practitioner for four hours a week. And I know that's one thing our students have said is beneficial because as they're taking their general medical class they are learning the heart sounds, lung sounds, all those pieces, and they are actually doing those on patients.*

Similarly, Cyrus elected to have his students complete their general medical exposure outside of the students' semester long clinical education experiences:

*Now we do an emergency room observation along the way; they have a general medicine observation, or rotation. We basically pull them out of their home base clinical education experience in their second year and send them to a general medicine clinical and they shadow a doctor for two weeks.*

*Preparation for professional practice fulfillment.* Finally, with regard to influence of the Standard, the participants noted that the intent of the Standard was to prepare students for professional practice, and acknowledged that this was similarly a goal they set for their students as well. Quinn explains that by requiring students to see a variety of patients and settings they are more likely to know where they would like to work when they graduate:

*And they have a better understanding now of where they would like to be placed and where they would like to work. Because we do filter them out to a high school setting, a clinical setting, a collegiate setting, or what have you, in a*

*hospital setting doing rounds, or wherever they are placed. So they have an understanding of where they would like to be placed for a job that they are seeking.*

Quinn asks the students to explain what they are lacking before she decides upon their final clinical education experiences:

*I want to know their areas of strength and their areas of concern. What do you need to work with? So know what you know, and know what you don't know. And where do you want to be when you graduate? What is it you want to do? So that's how I want to place you.*

Abby pointed out that the standard is there for the protection of the student who may not know what they need, “Because I still want them to have a variety, you know, I have students that want to have football every semester, and so if they could because the requirement allowed it, I wouldn't let them.” Jake also commented on the importance of this Standard; “That to me is probably the most important thing because it prepared the student for entering a broader range of careers with the more experience that they have.”

Overall Standard fulfillment was a clearly present category within the theme of major influences on placement. CECs employ varied mechanisms to fulfill the Standard, but all acknowledged that it consistently impacted their decision on clinical education placements.

**Not Influenced by the Standard.** As part of the method for selecting a successful student clinical education experience participants explained that parallel to Standard fulfillment there were other factors that influenced their placement decisions such as the

best interest of the student, matching with the preceptor, unique options to the program, and availability of placements.

*Best interest of the student.* Throughout the interviews participants stated the importance of the role of the CEC in terms of determining what was in the best interest of the students. David stated that it is the CEC's responsibility to know and evaluate experiences before sending students there, "You've got to look out for the kids, and if it's not going to be a good experience, then you just don't send them there. It's what you've got to do." Additionally, Abby pointed out that the CEC needs to know what is in the best interest of the student when considering new clinical site opportunities:

*Whenever I get a new site I always make sure it's a place where the student is going to be able to be involved, engaged, to be hands-on, to have supervised autonomy, if they're ready for that, so if I go to a place, and I'm doing a site visit to a potential new place, and I feel like the student is just going to stand around and observe, then I won't use it.*

Quinn also indicated that she considers what the student still needs professionally when deciding upon clinical assignments for the student:

*Let me give you an example, if I have student that we know as faculty, and we have observed in the classroom and a sterile environment, and also from feedback from previous instructors and preceptors in the field, that this individual needs more attention with preventative care, so they are lacking and maybe do not have the area of decision-making processes with prevention. Then I will place that individual in an environment with a preceptor that will concentrate on preventative care, or maybe that's their area of expertise.*

While the Standard requires a variety of experiences, some of those interviewed indicated that there are many considerations in addition to the Standard that are in the best interest of the students. Cyrus said, “Say the Standards aren’t there, I would still say that we would have a bucket list of what we would require from our program, and have a variety of exposure.” Similarly, when asked if she would change how clinical placements are determined if the Standard didn’t require specific experiences Abby replied, “I like having a variety, and I do my best for each student to get the variety, so I don’t think that would change.” Olivia echoed these sentiments when she responded, “Our program is pretty well in-line in that they need a wide variety of experiences, and so even if there was no Standard we would still work to get our students into multiple clinical experience settings.”

*Matching with the Preceptor.* All of the participants interviewed indicated that the importance of the preceptor largely influenced their decision to place students at specific sites, regardless of the Standard requirements.

*Well, if you look at clinical placement, I’m not sure there is a way you can really screw it up, unless you put the wrong student with the wrong preceptor. The environment is going to make the setting, the athletic training room is going to make the space, and the preceptor is the one that makes those things effective. The preceptor is who makes the learning opportunity for the student effective as well as makes sure the student is engaged. -Harrison*

When asked what makes for the most beneficial clinical experience David replied, “I think having a preceptor that is engaged. I think you’ve got to have a preceptor that understands that the student is there for an educational experience.”

The concept of the preceptor as an important influence on clinical placement was prevalent, as was the importance of training, and the perspective, of the preceptor. Quinn acknowledged that preceptors have a lot of expectations cast upon them when they begin working with a student.

*We expect these clinicians, who we've taught as clinicians, to now engage in education when their ultimate goal is their patient population in the clinical realm, and my goal for the students is for education. So we need to marry that, match that, and find a commonality or common ground, so they can intertwine with themselves. -Quinn*

Olivia felt that experienced clinicians sometimes make for better preceptors, and that this influences her decisions for clinical placement. She said, "Having additional years of that clinical experience is beneficial because then your preceptor is, I don't know, I think they just feel better with their own skill set, and then to be able to teach that to a student is much easier." David summarized the importance of the preceptor when deciding upon clinical placements by saying the following:

*All of it needs to be that the preceptor understands it is a student experience, they they're there to help educate the student, to help the student grow in the knowledge base that they have. And having an engaged preceptor is key because if they're not engaged it's a lousy experience for everybody. And it's largely lousy for the preceptor too.*

*Unique options to the Program.* Another major influence of clinical placements identified by the participants was the option for experiences that were unique to their

program. This aspect of uniqueness was frequently paralleled by the didactic structure of the AT Program. For instance, Quinn gave the following examples:

*We are changing our curriculum; we are offering some classes online the last semester. I'm trying to make the last year so these individuals can have full clinical rotations; they have no classes... And that [immersion] to me is something that is absolutely needed, and if the curriculum can afford to do it, and the program can do that, I think that would be awesome.*

*Something else that we do is a year-long rotation... We call it 'a year in the life of an athletic trainer' and that way when I place somebody in the fall they have the availability, if the student would like to stay and the preceptor is also accepting of the students staying... And that to me is such a rich experience because it takes out that honeymoon period, and by that I mean, you know what it's like when a student first gets there and they have to understand the documentation, and the expectations, and understand the patient volume, and the preceptors; that's the honeymoon period. And that takes a good three weeks. And then they finally get settled, and they can really begin to learn and everything begins to nurture and blossom.*

Other participants identified unique experiences that have been incorporated into their program as influenced by their assessments of the students. Cyrus stated, "We actually pull them out for two weeks and they end up at a physical therapy clinic type of setting and they see rehab... That was one of the deficits that we have historically seen, is that their rehab skills are not great." Jake's program utilizes other options to benefit the

students, “there is a residency program where the students get to see patients with the residents.” Likewise Abby identified options that were uniquely available to them, “Our orthopedic physician’s office, there’s two offices, but it is the same practice, they employ athletic trainers as physician extenders. So between their offices they have eight orthopedic physicians and 16 athletic trainers that work there.”

*Availability of placements.* One other sub-category of influence that was not relative to the Standard requirements was the availability of sites and/or preceptors. The CEC’s verbalized that availability was something they considered when selecting clinical placements for their students. When asked about his method for selecting clinical placements for students David replied, “I don’t know if there really is a method to that because a lot of the time it’s dictated on the availability of our preceptors, and that really, most times, drives how I do the assignments.” It was also identified that some of the availability of clinical sites or preceptors was dependent on the location and size of the program.

*Literally we have over 50 active clinical sites; we have over 70 preceptors associated with our program, so we can send a student to a lot of different places. I think that the Standard, really, just kind of gives a guideline and we meet it, but it’s not because we have to intentionally try to meet it. It just works really well with what we are doing. -Harrison*

Abby also commented, “I’m lucky that I’m in a big urban area, I have a lot of sites... I haven’t had a problem finding places, or using places... I know that I am lucky that I’m at a big University in a big urban area, and I have a lot of resources, and a lot of people, and a lot of sites.” Comparably Cyrus pointed out, “We don’t have that...



problem that other institutions might, that just physically don't have the slots to accommodate a large number of students if they need to, or preceptors for that matter."

### **Challenges/Barriers to Placement**

When discussing the approach to placing students at clinical education experiences the second theme identified was that of the challenges that the CEC's face in placing students. The categories seen within this theme relate to the AT Program structure, the clinical site options, and the number of students in the program.

**AT Program Structure.** The inherent structure of the AT Program impacts how clinical education placements are carried out. The participants in this study were all from post-baccalaureate level professional programs in which the professional program didactic and clinical components were all contained within the two year degree structure. Some program personnel identified this as a challenge to their placement process and goals. Cyrus compared the undergraduate and graduate opportunities, "It's kind of hard because I did this at the undergrad level too, and we had more semesters to work with." Analogously Olivia pointed out that they are only just able to meet the Standard in the timeframe they have and that this could be a challenge to selecting a variety of clinical education sites. She stated, "Really for us too, within a two-year timeframe they are not fulfilling this until their clinical experiences are completed at the end of the program." Jake also indicated that in order to obtain his goal of a variety of experiences for students he was unable to let them always have semester-long experiences.

*The first-year students, they have two rotations a semester. They're broken up; each rotation is eight weeks in length, and we try to get the collegiate experience and the high school experiences done in the first semester to give them the more traditional*

*experiences in athletic training, and then the second-year students; they are assigned the first semester to be with one program the entire semester... And for their second semester, the last semester in the program, is broken up into three rotations. And in those rotations, they are a little bit longer than a month long, and they get a little bit more of an intensive experience with their general medical rotations, and their therapy rotations. -Jake*

In fact, Quinn is considering re-structuring her didactic portion of the program to better accommodate opportunities for students to gain excellent clinical education opportunities.

*So what they're doing is they're practicing in the morning hours, and these are great experiences for the students, I don't want them to miss them. There's no way, I mean I want to put the students in there, not only for the athletic experience, but just for the docs that come through there, and everything they get to see, and how many residents come through there, and the MRIs and x-rays that are done right on the spot. I mean their clinics are just wonderful, it's a great atmosphere. So we have to start looking at our curriculum to change our curriculum too, so we can open up for the students to afford the opportunity to be where they need to be at any time. - Quinn*

**Clinical Site Options.** Comparative to the urban schools that identified the ease with which they are able to recruit clinical sites and preceptors, it was repeatedly acknowledged throughout interviews that more rural schools don't have the same luxury and that location was a challenge for determining clinical placements. Harrison detailed his challenges:

*To get to the suburbs where they actually have athletic trainers you have to drive 15 – 18 minutes to get to high schools that have athletic trainers. Why can't it be closer? They're just not here ... And you see this map that is just expansive. It goes 35 miles east and 35 miles west. And north and south it goes 25 miles. Just to include our normal rotations.*

Olivia had a similar position stating, "I think for us the biggest piece in the placement options is just location... Some of them [students] do have to drive an hour to get to them."

Quinn's challenge more readily identified competition as a barrier to placements.

She explained:

*If we have multiple students; we compete with (competing school name), so we have multiple students at multiple sites, now that's a benefit, but that's also a drawback because when we are around them trying to filter these individuals for gen med, these hospitals are also taking pharmacology students, and residents, and they're taking physical therapists, and they take nurses, and they're taking exercise physiologists, and nutritionists, I could go on and on. And it seems like because of our profession, which I'm sure you're aware of, that we are kind of the last mill to get through the door.*

Jake echoed these sentiments when he stated:

*We are in the largest medical hub within a 5 or 6 mile radius and it seems that we get a lot of students from all of the different medical professions here that want to experience, you know, either shadowing, or just time spent with the providers. So sometimes that's a little bit of a challenge.*

Cyrus' state location created a unique challenge relative to location and competition. He explains:

*We have an old-school internship program that's been here forever, and we are a brand-new MSAT program..., so there are still interns that are doing the undergraduate model, so I have to pay attention to how many interns do they have. You know, is that going to be a factor in putting a Masters student there?*

In the barriers to clinical education experience options, CEC's further identified that their choices are also restricted by associated costs to the student and fair practice limitations.

*It does make it a little bite more difficult at times because we have had problems, especially with the general medical rotation there, the variety of conditions other than orthopedic such as primary care, that's what I call my general medical rotation, and we used to be able to get all of students into the county health department, but they recently started charging a \$250 fee for all students rotations that we hadn't had in the budget, so that kind of put a stop to that. -Jake*

Quinn also had to take these financial drawbacks into consideration as a barrier to placing students at certain clinical sites. She described:

*Then I staircase it all the way to the point where the students are saying this is my outside job, or I don't have a vehicle, or the money that I make is contributed to my family, or I need to be closer to the institution so I really can't travel that far, so those are the types of considerations.*

Olivia also described problems when trying to set up a unique experience for her students. She explained:

*There is a semi-professional hockey team an hour away from us, so we've also tried to work with their athletic trainer to set up clinical rotations there. The problem is right now the building they are in is not a gender-neutral facility. So to open that up to all students is really hard. At this point in time the building is going through renovations, and when those renovations are done we could [place students there].*

**Number of Students.** Participants identified the number of students either within the program, or at specific sites, as a consideration that influenced clinical education placements. Cyrus summarized his concerns by saying, “You know, I can’t get everybody where they want to go because I don’t have enough slots and I have too many students.” He also went on to say, “Then I look at numbers that the undergrad plays into, especially at football, or where there is a volume or number factor... because I don’t want them over there where they’re just going to be warm bodies by any means.” Olivia conversely felt that there are certain sites that were not giving the students enough of a break because there was such a high volume. She explained, “So we modified the numbers that were going to that preceptor and to that site. We actually increased those so that students were actually given release time for that.” Abby described how she addresses concerns regarding the number of students she has in her method for reviewing and adding clinical sites at the start of the year. She said, “I usually take a look at my student numbers beforehand, and then I know if I need to add like another equipment intensive site, or another non-sport site.”

### **Requests for Placement**

Requests for student clinical education placement were consistently identified as having a role in the method by which the CEC assigned students to clinical education experiences. Requests were evident in two areas: *Student Requests* and *Preceptor Requests*.

**Student Requests.** Participants consistently stated that students request settings, specific sites, or preceptors as they progress through the clinical education portion of the ATP. Oftentimes these requests are welcomed and granted if possible.

*We try to accommodate a request if the student has an individual desire to get some experience working with an athletic trainer who is a physician extender, in a clinic, or an emergency room experience, or what have you...I do take a little bit of student requests into consideration, but you know, only to the degree that it will fit in the categories that they still need to get covered as far as the curriculum is concerned. - Jake*

Olivia expounded that she elects to honor student requests in order to give students experience relative to their career goals.

*So if I have a student that tells me that they want to work, when they leave our program, at a high school. I will work to place them in that type of clinical experience with a preceptor who is at a high school on a day-to-day basis. If they were to tell me that they wanted to work at a collegiate NCAA Division I level for football, we would try to place them at that; at a clinical site and with a preceptor who could help them to understand what it's like to, to be an athletic trainer in that setting. -Olivia*

Cyrus took a similar approach in inviting students to give requests relevant to career goals. He explained, “You know, if I can get them somewhere where they want to go, usually based on what their career goals are going to be, you know, not just ‘I want to work football’, you know everyone wants to work football, but okay, what do you want to do? What’s really going to help you?” Abby takes a parallel approach for reasoning behind requests. However, instead of career goals she encourages the student to identify skill weaknesses and then request sites that would permit the student to address those. “If they feel that there is an area of weakness, for instance, if they feel that they’ve seen a lot of lower extremity injuries, but maybe not a lot of upper, like they feel like they are showing a weakness of some sort especially in their... second year.”

Furthermore, Quinn felt that it was important that students have input to their placements. She specified, “These are young minds, and I think that it’s good that we’re trying to mold them, but we also have to let them have their voice in this.”

While many supportive statements were made regarding student requests for placement there were several assertions that accepting and honoring requests from students is not always in the best interest of the student. Quinn, who does allow students to submit requests, explained that there is a point in time that the CEC knows better what the student needs, and the students’ understanding evolves over time.

*We might know what is best because we’re looking through a different lens. We’re looking at the student as well as the preceptor. Then there comes a time that the student has a better understanding and knows their areas of concern, and that’s what we try to build here; is that they have to understand that and own that now. -*

Quinn

In opposition to other participants, Harrison was very explicit in how he feels about requests, he proclaimed, “You know that is such a slippery slope. I would like to say that no, I do not. Like if a student walked in to my office today and said that they wanted to go to X site, I can tell you where they are not going. They’re not going to whatever it was that they asked for.” David explained that the requests that students have made in the past have sometimes not worked out the way that they had hoped. He said, “Over time, once they got into it, they all said ‘you know, I don’t know why I requested that. That kind of sucked.’ Not sucked for the wrong reasons, but it’s not what they expected.” Quinn also pointed out the downside to accepting student requests when she gave the following example,

*That was a double-edged sword for me this past year for the very first time in my 13+ years that I’ve been doing this. I actually had to pull them from the table because I actually had students that were trying to jockey themselves into a position to get what they were looking for.*

**Preceptor Requests.** In addition to student requests, CECs acknowledged that they had received requests from preceptors as well. While the student requests primarily revolved around career goals, setting, or sport, the preceptor requests vacillated between requests for specific students and particular level students. Harrison, who does not honor requests from students, described this scenario:

*I will give you a very honest answer. I have actually honored one request for one preceptor that wanted a very specific student, and there was a long list of why; a multitude of reasons. So I absolutely honored that request. The student didn’t do very well. So was it because of the student, or was it because of the preceptor? I*



*don't know. So now I am open to suggestions from preceptors, but I don't know that I would automatically say yes.*

Cyrus is also open to requests for specific students, but includes the caveat that he may or may not be able to fulfill them.

*If they have a special request and I can accommodate them, I will do it. I will definitely do it. As long as there is no adverse effects to it I will do it, and if I can't, I will tell them, look, here's the deal; this is why I can't, whatever the case may be. Or, I don't think that that's going to be a good fit, or you know I can't accommodate that request because of x, y, and z. And those preceptors are usually fine with that as long as I give them a good reason for it. - Cyrus*

Abby also honors requests for specific students, but typically just for a specific sport. She described the process:

*I do allow the football staff, who sits in on our interviews, to give me their list of students that they are interested in, and then I work with that list. It's not like tell me they want these eight students, and I just assign them, but I do let them because I feel like football is a little bit of a different animal, and I really only want students there that want to be there for football.*

Some of the participants described requests for types of students. For example Quinn described the requests that she has gotten regarding students of a specific skill level:

*There are, especially the Division I's, will say this is a type of student that I need. I need someone, not so much male or female; I don't get that as much as I used to maybe 10 years ago, but they are at the autonomy level. Do they have the critical*

*skills and the problem-solving, and the critical thinking skills that I don't have to mandate what I need them to do?*

Jake described similar requests, “Sometimes they would request to have a couple of second year students that are a little bit more independent in their evaluation skills, where they would still be there to supervise them and everything, but the students have a little bit more knowledge under their belts.” Cyrus succinctly put it when he said, “Everyone wants a seasoned student.”

Cyrus went on to explain that if you want preceptors to continue to have involvement in the program, you do need to keep them satisfied. He said, “We want to make them happy, so there is a little bit of a political card that we play there somewhat.” However, he clarified that the bottom line when considering requests is the students’ best interests.

*I have had preceptors in the past that did sometimes ask for things, and I'm like, what's your rationale behind that? Why do you think you need that, or want that? And it usually comes down to a warm body request, and that's not, you know, you've got to come up with a better reason than that. You know, I can't do that, that's totally detrimental to what we're trying to do from an academic standpoint.*

-Cyrus

### **Suggested changes to standards that impact clinical placements**

While this theme did not yield the same frequency of response as some of the others, there were a significant number of responses that suggested components that the

participants would like to have considered to be either included in or excluded from future editions of the Standards.

**Included in Standards.** Participants identified a disconnect in the idea that CECs are supposed to assign students to a preceptor, when in fact, the Standard only delineates settings or experience types. Quinn noted, “It’s almost like the CAATE Standards are secondary to preceptor matching. So the CAATE Standard has not caught up to preceptor matching.” She also went on point out that the Standard does not have outcomes associated with clinical education placement requirements.

*I would include [in the Standard], you know, behavioral characteristic outcomes, it would be more a reflective process. You know what the students have engaged with, and what they have learned compared with where we want them to be as an entry-level athletic trainer. So I would dive more into, not so much about the extremity because that’s something we teach in the sterile setting they will get that, but I’m looking for a more encompassed understanding of the decision-making process and the problem-based, so I think that’s really been taken out for clinical education. - Quinn*

Quinn also questioned how it is determined that a student is able to function in professional practice.

*There is no standard as to how much time would need to be incorporated, what are they actually supposed to learn? I think I would have to, if anything, maybe not extract that, but give outcomes based on the general medical. I think that’s where I would probably venture more towards that area, what is actually expected of the students and of the program? -Quinn*

In addition to outcomes, types of experiences such as surgical observations and pediatrics were identified as potential areas for inclusion.

*Guess the only thing that's not explicitly stated in here would be like surgical pieces. Because again, depending on the environment that you go into, having some surgery background would be good as well. And our students get that when they are at an orthopedic clinic and they follow a physician as well. -Jake*

Cyrus suggested another type of experience relative to the patient population, "I might, I don't know if I would put pediatric in there...Because we have some general medical physicians where their clinics are a little more pediatric-based clinics, and I don't mean just concussions, I'm talking about across the board of pediatrics." Cyrus also indicated that he thought the Standard should allow for the flexibility to consider the students' career goals. He said, "I think some diversification, but that could be dictated by career goals of students."

**Excluded from Standards:** There were components of the existing Standard that the participants identified as having potential for removal/exclusion. Quinn stated, "I feel that it is a blanket standard. That it does not incorporate the attributes or the behaviors of each individual student or preceptor... And to me there's a disconnect there. They're wanting us to be outcome-based, but the Standard itself is very generic." Cyrus expressed his concern by saying, "I don't know if the individual and team sports thing is going to do what their intentions are." Abby's comments aligned with this sentiment as well. She stated, "I wouldn't pay as much attention to individual versus team sports necessarily. Because we are treating a person, not a team... I don't think the individual and team sports makes a difference."

Cyrus also expressed a concern about how many of these experiences are really necessary for all of the students in a program.

*Do you want to totally change the wheel, or just add some spokes along the way?*

*And I think we are okay just adding some spokes along the way, but I think if they start adding too much, you know, and trying to graduate the perfect BOC prepped athletic training student that's got experience and has been exposed to every single setting in the world; there's going to be a lot of institutions that can't back that up. - Cyrus*

Our results indicate that there were components of the Standard that influence CECs methods and goals for clinical education placements, but there were also many other considerations that either influenced placements, or provided barriers to placement. CEC's should not strive to minimally comply with accreditation Standards, but should seek opportunities for their students that reflect goals of the student and the experience, as well as the uniqueness of each AT Program.

### Discussion

#### **Quality Clinical Education**

Clinical education is an essential component of all healthcare professional education programs. The purpose of clinical education is to incorporate didactic instruction into real-world application as the student transitions from the ability to perform general technical skills to clinical competence.<sup>13</sup> It has been shown to be more beneficial to the student to obtain a quality clinical education experience, as opposed to accumulating a specific quantity of clinical education hours.<sup>14,15</sup> As CEC's are responsible for determining clinical education experiences<sup>2</sup> it is therefore their

responsibility to determine the quality of the clinical education experiences available to the students enrolled in their AT Program.

Clinical education in Physical Therapy (PT), a peer profession to AT, constitutes just under 50% of the curriculum content for PT programs.<sup>16</sup> Students within PT programs are required to fulfill clinical education opportunities that encompass patients with diseases and conditions across the lifespan and continuum of care.<sup>17</sup> Furthermore, the only setting specific requirement for Physical Therapy education is that students receive clinical education experiences representative of those in which physical therapy is practiced.<sup>17</sup> Lastly, Physical Therapy programs are required at minimum to provide 30 weeks of full time clinical education experiences within the curriculum.<sup>17</sup> Directors of Clinical Education within Physical Therapy are given the autonomy to select immersive clinical education experiences that provide experience with a large variety of patient populations.

The process by which CEC's plan for the placement of students at clinical experiences in athletic training has not been thoroughly documented. Within physical therapy, the goal of clinical education placement entails that the students and instructional staff work together to outline a long-term plan to allow the student the opportunity for the best-fit model of clinical education.<sup>18</sup> The need for advanced planning for athletic training students may be necessary to ensure that all students fulfill all components of the existing CAATE Standard. Now that the accreditation Standard requires components of the experience with the general population, and some programs have limited access to practice setting which offer this, careful planning would need to be incorporated to guarantee that all students within a given program are exposed to this

option. There are proponents for the transition to a more hybrid learning structure within the educational curriculum for healthcare providers; allowing for more web-based lecture that can be completed based on the students' schedule while they complete full-time, immersive clinical education, with the inclusion of specific laboratory components completed in-person.<sup>19</sup> One of the CECs interviewed indicated that she would be attempting to incorporate this method of instruction to better allow for quality clinical education experiences for students.

It has also been noted that models of clinical education in PT are guided by the needs of the profession, the students, the clinical education faculty, and the clinical education sites among others.<sup>18</sup> These identified needs were mirrored in our findings regarding the influences of Clinical Education placements. CECs are inclined to consider preparation for professional practice, the preceptor, and the available sites as major influences to the clinical education placement selection process in an attempt to provide quality clinical educational experiences to athletic training students.

### **Goals of Clinical Education Placement**

#### *Standard Fulfillment*

Accreditation Standards for healthcare providers vary in their requirements for Clinical Education for students. Physical Therapy requires clinical education experiences that provides that opportunity to practice with patients across the lifespan with a variety of conditions within settings that Physical Therapy would be practiced.<sup>17</sup> Physician Assistant (PA) programs are required to provide supervised clinical practice with a variety of types of patient encounters including preventative, emergent, acute, and chronic, as well as surgical management, and behavioral and mental health conditions.<sup>20</sup>

They are also required to provide sufficient patient exposure to the following types of patients; infants, children, adolescents, adults, elderly, and women.<sup>20</sup> Lastly, PA programs are required to place students in the following settings; outpatient, emergency department, inpatient, and operating rooms.<sup>20</sup>

Similar to Physical Therapy, Occupational Therapy programs are required to provide a minimum of 24 weeks of full-time field work with a variety of clients, across the lifespan, and in a variety of settings.<sup>21</sup> Overall, the Standards from peer professions are less prescriptive in setting than those required in AT, and are mostly reflective of the desire to prepare the students for likely patient exposures in professional practice.<sup>2,17,20,21</sup> Our findings indicate that CECs mainly focus on setting fulfillment when fulfilling the Standard for clinical education experiences. Physical Therapy, for example, requires that clinical education provide experiences corresponding to didactic coursework that would prepare a student to provide care to individuals with disease or disorders involving the major systems or multiple systems, across the lifespan and continuum of care, and that clinical education take place in practice setting representative of those in which physical therapy is commonly practiced.<sup>17</sup> This is significantly less prescriptive than the requirements of AT clinical education.

Standard fulfillment was identified as taking precedence over other influencing components in the clinical education selection process. Within Physical Therapy clinical education published recommendations regarding the accreditation standards encourage the development of non-technical standards that emphasize the promotion of professional behaviors and collaborative responsibility.<sup>16,18</sup> In AT the current Standards do not address



attainment of non-technical traits for students, and so, as existing requirements are attained, CECs consider other influences that are unrelated to Standard fulfillment.

### **Factors Influencing Placement**

#### *Preceptor matching*

The student-preceptor relationship has been identified as one of the most critical components for a successful and productive clinical experience for students.<sup>22</sup> This was identified within our results as well with CECs identifying this is a primary influence for clinical education placement selection, often times selecting preceptors that would facilitate the best interests of the students. However, there are times that this component must be ignored in an effort to fulfill the requirements of the Standard. If a student was in need of an equipment intensive assignment in their final semester/experience, then the preceptor personality or relationship was less likely to be considered, as it is irrelevant as far as fulfilling the Standard's requirements.

The focus on student-preceptor personality match has been identified in the research as one of the components that is a main predictor of a successful clinical experience.<sup>22</sup> Specifically, athletic training students have acknowledged that their preceptor's support and mentorship was one of the primary reasons that they chose to stay in the profession.<sup>3</sup> Additionally, AT students identify that an engaging learning environment for Clinical education is dictated primarily by the interaction, communication, and experience with the preceptor at that location.<sup>23</sup> Without a successful personality match between student and preceptor the resulting experience may cause the student to lose motivation to seek out educational integration experiences, which ultimately defeats the objective of the clinical experience.<sup>3,24</sup> Our findings indicate

that CECs similarly understand the importance of the preceptor match, and primarily consider the preceptor, either their strengths in teaching, or their personality, when selecting clinical education placements for their students.

### *Requests*

There is no available research that dissects the existence, or subsequently the possible benefits or detriments, of accepting requests from students as to their clinical education placements. However, given the frustration of educators regarding student turnover within the athletic training profession,<sup>3,8</sup> it seems plausible that granting the request of a student to gain experience in the setting that said student intends to ultimately practice in might result in a better understanding of the hour and work requirements of that setting. This might have the potential to increase the number of students who continue to pursue a degree and ultimately a career within the field of athletic training. Our results indicate that the CEC's do, for the most part, attempt to consider some aspect of student preference when determining clinical placements. Conversely, as it was suggested within our results, the student may not always request the experience they would most likely benefit from, or even realize what they need to benefit from, therefore it would appear that best practice would be to limit the number of allowable requests from a student to ensure that their educational needs are still met, as the participants in this particular study explained as a policy that they adhere to.

Additionally, it is imperative that the goal of the clinical education experience remains to allow the student the most optimal educational experience. Therefore allowing preceptors to make requests to mentor specific students should not be encouraged. This has the potential to ultimately create an environment that rarely

incorporates the educational needs of the student. Unless there is a pressing beneficial reason for the student to be mentored by the requesting preceptor, as was explained by one of the participants in this study, it is likely best practice to not consider the preceptor request when outlining the goals of the educational experience of the student.

### *Location*

There is no existing research which examines the geographical locations of AT Programs relative to how their clinical education site options are impacted. Physical Therapy utilizes a clinical education model that allows for diverse geographical placement for clinical education, including international placements, due to the ability to solely immerse the student within clinical practice.<sup>16</sup> Many clinical education experiences in AT are conducted parallel to didactic instruction within the academic calendar, so for most AT Programs clinical education experience opportunities are local to their Institution. The CECs in this study identified that this does impact the options of their Clinical Education Experiences, although this was sometimes seen as an influence and other times viewed as a barrier. CECs may need to consider adapting curricula to allow for a more diverse geographical selection of clinical education sites which may allow programs to also allow for clinical immersion.

### **Limitations and Suggestions for Future Research**

This study was qualitative in design with an assumption of honesty from all participants. This study's participants were all CECs at professional post-baccalaureate AT Programs and the influences and barriers that they described may differ from those experienced at the baccalaureate level.

Future research should examine other components that constitute quality clinical education experiences that could warrant future CEC consideration in determining clinical education placements. This may include the examination and comparison of various clinical education models, including those utilized by peer professions, to determine the best practice for quality clinical education. Additionally, future research should evaluate the true educational needs of AT students relative to professional practice, specifically relating to type of patient encounters and setting of experiences, to determine if new accreditation Standards are warranted to improve the quality of clinical education experiences that programs are mandated to provide to their professional students.

### Conclusions

Standard fulfillment will continue to be a major influence on clinical education experience placements, and as such future Standards should be written to allow the CEC the flexibility to select Clinical Education experiences for students based on the best interest of the student and the best Preceptor match for the student. CECs should consider allowing students to make requests to incorporate the students' professional goals into the clinical education experiences so as to allow students to have ownership of their educational experience however; these requests should not take precedence over the best interest of the students, nor their preparation for diverse professional practice. Program personnel and CECs should also consider curriculum re-structuring to allow the student total immersion in clinical education.

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**Table IV.A.1: Participant Demographics**

Name*	Number of Years as CEC
Jake	3
Olivia	5
Abby	7
Cyrus	4
Quinn	14
Harrison	3
David	4
*names of participants have been changed	



**Table IV.A.2: Interview Protocol**

Standard (read prior to any questions asked):

Students must gain clinical education experiences that address the continuum of care that would prepare a student to function in a variety of settings with patients engaged in a range of activities with conditions described in athletic training knowledge, skills, and clinical abilities, *Role Delineation Study/Practice Analysis* and standards of practice delineated for an athletic trainer in the profession. Examples of clinical experience must include, but should not be limited to: Individual and team sports; Sports requiring protective equipment (e.g., helmet and shoulder pads); Patients of different sexes; Non-sport patient populations (e.g. outpatient clinical, emergency room, primary care office, industrial, performing arts, military); A variety of conditions other than orthopedics (e.g., primary care, internal medicine, dermatology).

Questions:

1. Can you describe for me the methods that you currently utilize to determine students' clinical placement assignments within the confines of this standard?
2. What do you consider to be the main placement considerations when deciding upon a student's clinical assignment?
3. How does this standard affect your options for student placements?
4. What are your goals for student placement?
5. Follow-up (if not answered previously); how does this standard affect your goals for student placement?
6. How do you incorporate requests from the student when determining a student's clinical assignment?

7. How do you incorporate requests from preceptors when determining a student's clinical assignment?
8. Are there any requirements or options that you consider unique to your clinical assignments that surpass the standard? If so, please describe them.
9. Once the requirements set forth in the standard are fulfilled, what are your main considerations for student clinical placement?
10. If this standard didn't require specific experiences, what would your main goal for each student placement be?
11. If this standard didn't require specific experiences, how might your methods for student placement change?
12. If this standard didn't require specific experiences, what might your main considerations for student placement be?
13. If this standard didn't require specific experiences, how might this affect the placement options that you would have available?
14. If this standard didn't require specific experiences, how would this affect your willingness and ability to incorporate student and/or preceptor requests?
15. If you could re-word this standard to describe how you think clinical experiences should be fulfilled, what would you include?
16. If you could re-word the standard to describe how you think clinical experiences should be fulfilled what would you exclude?
17. What do you think makes for the most beneficial student clinical experience?
18. (follow up to 17) Do you feel that you are able to incorporate those considerations when you select student placements currently?

19. Are there any questions regarding clinical placements in relation to the CAATE standard that I have not asked that you would like to discuss?

**Figure IV.A.1: Clinical Education Coordinator’s Selection of Clinical Education Placement: Themes, Categories, and Sub-Categories of Findings (Frequency Count).**

Influence On Placement (127)		AT P Structure (9)	Challenges To Placement (37)		Requests for Placement (55)		Suggestions for Standards on Placement (18)	
Influenced by Standard (39)	Not Influenced by Standard (89)		Clinical Site Options (21)	Number of Students (7)	Student Requests (34)	Preceptor Requests (21)	Included in Standards (10)	Excluded from Standards (8)
Standard fulfillment (18)	Best Interest of the Student (26)							
General Medical Fulfillment (6)	Matching with Preceptor (33)							
Preparation for Professional Practice Fulfillment (15)	Unique Options to the Program (18)							
	Availability of Placements (11)							

## CHAPTER V

### **Project IIIA: Evaluating Athletic Training Student Core Competency Implementation During Patient Encounters: A Pilot Study**

Title: Evaluating Athletic Training Student Core Competency Implementation  
During Patient Encounters: A Pilot Study.

Authors: Julie Cavallario, Bonnie Van Lunen, Johanna Hoch, Matthew Hoch, Sarah  
Manspeaker, Shana Pribesh

To be submitted to: Journal of Athletic Training

## Introduction

Clinical education for athletic training (AT) students has evolved from the paradigmatic guidelines of medical education. There has been an internal evolution of this clinical education from an apprenticeship model to that of a competency-based instruction model.<sup>1</sup> Delforge and Behnke's<sup>6</sup> historical review of athletic training outlines the profession's early focus on quantity of experience during the clinical component of the educational process. The review also incorporates the changes made early in the 21<sup>st</sup> century away from a mere total hour requirement and more towards an all-inclusive educational model in which didactic instruction is mirrored in clinical education experiences.<sup>6</sup>

A common theme found in the clinical education of medicine, nursing, and AT students is the use of learning through direct patient contact.<sup>2-4</sup> Early patient contact was found to be beneficial and valuable in helping to promote active roles, bringing theory taught in the classroom into clinical practice, and building students' confidence.<sup>2-4</sup> Although this preliminary research is beneficial, additional information is needed to explore details related to the quality and quantity of patient encounters for students, and how this affects the students' abilities to function autonomously as a future competent practitioner.

Real-time patient encounters enhance students' confidence levels within their practice.<sup>5</sup> The 5<sup>th</sup> edition of the Athletic Training Education Competencies further supports this type of learning by explicitly stating that Clinical Integrated Proficiencies are intended to be used in real-time situations to allow growth in clinical decision making.<sup>6</sup> The setting or site at which the clinical placement occurs may also have an

effect on the students' ability to participate in active learning<sup>2</sup> and on opportunities for real-time proficiency evaluation.<sup>5</sup> The CAATE AT accreditation standards require that clinical education take place through experiences that include equipment considerations, patients of different sexes, non-sport patient populations, individual and team sports, and with a variety of conditions other than orthopedics.<sup>7</sup> However, the quality of the students' interaction with the patient and the number of interactions is not addressed by the current Standard, thus leaving a void in examination of clinical outcomes linked to the assignment strategy currently being used.

In 2001 the Institute of Medicine (IOM) published a report that called for an overhaul of the medical system, including the education of healthcare professionals that will become practitioners within that system, to provide patient-centered care with the ultimate goal improved patient outcomes. This recommendation entailed incorporating these practices into the actions and education of healthcare providers to improve patient care.<sup>8,9</sup> Overall assessment of competence related to healthcare competency (e.g., Evidence-Based practice, Professionalism, Patient Centered Care, Quality Improvement, Use of Healthcare Informatics, Interprofessional Education and Collaborative Practice) is important in order to assess whether or not AT students are prepared to practice autonomously. Other healthcare professions have published evidence relative to their attempts to incorporate these recommendations into their didactic curriculum,<sup>10,11</sup> yet it has been minimally discussed in AT education related literature.<sup>12</sup>

The manner in which Core Competencies can be incorporated into clinical education has also been examined in other healthcare fields such as nursing and medical education.<sup>13,14</sup> One exploratory qualitative study examined medical residency programs to

describe if and how core competencies were addressed during supervision within the residency experience. It was determined that the Core Competencies are included superficially and in an unconscious manner, without purposeful direction or intention.<sup>13</sup> Additionally, evidence from nursing programs whose clinical education components were quantity based compared with those directed by the achievement of clinical competencies further supports these findings.<sup>14</sup> It was determined that clinical hour requirements cannot predict comprehensive exposure to all Core Competencies necessary for entry into professional practice.<sup>14</sup> Both of these studies demonstrate a need for purposeful and comprehensive inclusion of Core Competencies within the clinical education component of healthcare professions.

The existing evidence from other healthcare fields suggests that early patient encounters for AT students would be beneficial, as would be the purposeful implementation of professional Core Competencies during such experiences. However, there is no existing research relating facets of the clinical education experience with Core Competencies as a means by which to conduct a summative assessment of the clinical experience. Therefore, the purpose of this study is to determine the relationship between the frequency and length of patient encounters, as well as the student's role and clinical site placement of the student during patient encounters, with the students' perceptions of Core Competency implementation during these encounters.

## Methods

### *Design*

This study utilized a Panel Design which tracked a cohort of students over the course of one academic semester.

### *Participants*



E\*value (Advanced Informatics, Minneapolis, MN) is a software program that provides tracking and record keeping capabilities to healthcare education programs. A list of current Athletic Training Programs that utilize the E\*value software was provided by the software company and purposeful sampling was utilized to recruit an institution willing to participate. Professional AT programs that utilized the software were contacted to determine the extent of utilization of the program, specifically the aspects related to tracking patient encounters. Once a program that met the minimal requirements for E\*Value utilization agreed to participate recruitment was stopped. The selected program was within an NCAA Division I Institution with Carnegie Classification of RU/VH (very high research activity). The participating program was currently utilizing E\*value and was minimally requiring their students to record the number of patient encounters, the type of patient encounter, and the level of supervision of those encounters by their preceptor. The participating program's Program Director provided the student list by year within the program, as well as each students' assigned clinical site for the semester, to the primary researcher. The participating program conducts a three year professional phase as part of their overall curriculum. All students (N = 43) enrolled in the professional phase of the program were asked to participate. Informed consent forms were signed by the participating program's Program Director, and the students who agreed to participate (N=40, Table V.A.1). The primary researcher provided a 20 minute recorded educational program to the participating program's Program Director that students viewed during a program meeting prior to the start of their clinical experience. This was a planned programmatic meeting at which the Program Director required attendance, and oversaw the delivery of the educational materials. This educational session was included to ensure

that all participating students had the same minimal baseline awareness of the components of each of the six Core Competency areas. The materials were further posted in online format that the students had access to throughout the course of the semester to reference as needed to review elements of each of the Core Competency areas as they catalogued their ongoing patient encounters. As part of a program requirement, separate from this study, the program also required students to complete six reflective assignments over the course of the semester, one per Core Competency, in which the students discussed specific experiences in which they implemented that Core Competency. Approval for this study was obtained from the Human Subjects Research Committee within the Darden College of Education at Old Dominion University (#201403008), and well as the participating Institution's Institutional Review Board (#E8858).

### *Instrumentation*

The Educational Core Competencies framework was used to examine the implementation of six Core Competencies (Evidence-based Practice, Professionalism, Quality Improvement, Interprofessional Education and Collaborative Practice, Patient-Centered Care, Use of Healthcare Informatics). The internet based computer program, E\*value, was used to track patient encounters. Minimal usage of the software's available tracking mechanisms included indicating that a patient encounter occurred, what type of encounter occurred (actual patient encounter, practice encounter with peer or preceptor, didactic practice scenario, etc.), the type of procedures performed on the patient for that encounter, site at which the encounter occurred, and the level of autonomy the student performed at for this encounter. An additional block of questions was created within the patient encounter reporting page (Table V.A.2). For each patient encounter the student

was able to select the role they fulfilled. The student could input Observed, Assisted, or Performed, but also could select Other or any combination (i.e. observed and assisted, or performed and other) of the four aforementioned roles. For the purpose of this study the students who input any combinations of roles for any encounters were all placed into the Other category. The students also had the opportunity to input their Clinical Site type (College/University, High School, Clinic, Health Services, Physicians Office, etc) when documenting patient encounters. Students who selected any Clinical Site for a patient encounter that was not either a College/University or High School were assigned to an Other group ( $N=11$  encounters).

#### *Collection Procedure*

Patient encounters were tracked daily throughout the fall semester. The Program Director monitored student encounter data input and reminded students to input data if they weren't doing so in a timely fashion. Student records were downloaded monthly by the institution's Program Director, and forwarded to the primary investigator.

#### *Data Analysis*

Participant responses were uploaded into PASW Statistics (version 21.0, SPSS Inc., Chicago, IL). Due to the nature in which encounters were reported data were analyzed in two different manners. One method included grouping data by patient encounter, and the other method grouped data by student. When analyzing by patient encounter, variables included encounter length (minutes), role of student per encounter, site at which the encounter occurred, and whether or not each Core Competency was implemented (yes/no). When analyzing data by student, variables included average encounter length per student (minutes), encounter frequency, modal role by student during encounters, clinical site of student assignment, the number of times each Core

Competency was implemented over the course of the semester per student, the total number of Core Competencies implemented by the student over the course of the semester, and the average number of Core Competencies implemented by the student over the course of the semester.

Collinearity diagnostics were run prior to data analysis to determine that none of the independent variables were highly correlated with each other. Descriptive data were tabulated for Core Competency Implementation (total, Professionalism, Quality Improvement, Use of Healthcare Informatics, Interprofessional Education and Collaborative Practice, Evidence-Based Practice, and Patient-Centered Care), as well as for the independent variables (patient encounter frequency, patient encounter length, role of the student, and Clinical Site of the encounter). These descriptive data are outlined in Tables V.A.3, V.A.4, and V.A.5.

Separate one-way between subjects analyses of variance (ANOVA) were utilized to determine if the Role (Observed, Assisted, Performed, or Other), or Clinical Site (University/College, High School, or Other) were related to the implementation of total number of Core Competencies. All post-hoc analyses for significant main effects were completed using a conservative Bonferonni alpha adjustment.

Multiple linear regressions were used to determine how the average length of patient encounters by students and the frequency of patient encounters per student related to the average number, and total number, of implemented Core Competencies. Binary logistic regression models were used to determine how the length of each encounter related to the implementation of each Core Competency, as well as how the role of the student per encounter and type of clinical site at which the encounter occurred impacted

the students' ability to implement the Core Competencies. As the role of Assisted had the highest likelihood of Core Competency implementation ( $M = 4.46$ ,  $SD = 1.08$ ) as compared with Observed ( $M = 4.17$ ,  $SD = 1.10$ ), Performed ( $M = 4.14$ ,  $SD = 1.43$ ), or Other ( $M = 3.13$ ,  $SD = 1.61$ ), it was determined that Assisted would be the role for the basis of comparison for the binary logistic regression (omit category) when examining Core Competency implementation for each individual competency based on the role of the student. As University/College setting is typically identified as the traditional setting in which the athletic training student completed clinical requirements it was selected as the basis for comparison for the binary logistic regressions (omit category) when examining the implementation of each of the individual Core Competency categories based on the Clinical Site Assignment of the Student.

Finally, a Multiple Linear Regression was performed to determine how all independent variables by student (frequency of patient encounters, average length of patient encounter, modal role of student, and clinical site) were related to the total number of Core Competency implementations for the semester. Level of significance for all analyses was set *a priori* at  $\alpha < 0.05$ .

### Results

The Core Competencies were implemented over a total of 2,744 patient encounters with an average of four Core Competencies implemented per encounter ( $M = 4.04$ ,  $SD = 1.37$ ). Students were most likely to report that they implemented the Core Competencies of Patient-Centered Care (91% of encounters) and Professionalism (99% of encounters). Students were least likely to report implementation of the Use of

Healthcare Informatics (46.4% of encounters) and Interprofessional Education and Collaborative Practice (27.6% of encounters) (See Table V.A.3).

#### *Patient Encounter Length by Student*

The average length students spent in a patient encounter was 19.29 minutes ( $\pm 23$  SD) (See Table V.A.4). The average length of the patient encounter was negatively related to the implementation of the total number Core Competencies ( $b_{(2,34)} = -0.64$ ,  $r^2 = 0.61$ ,  $p = 0.000$ ). The average length of the patient encounter was not significantly related to the average number of Core Competencies implemented per student. ( $F = 1.79$ ,  $p = 0.190$ ). The average length of the patient encounter was also negatively related to the number of times four of the six Core Competencies were implemented: Patient-Centered Care ( $b_{(2,34)} = -0.63$ ,  $r^2 = 0.54$ ,  $p = 0.043$ ), Evidence-based Practice (EBP) ( $b_{(2,34)} = -0.38$ ,  $r^2 = 0.36$ ,  $p = 0.000$ ), Quality Improvement ( $b_{(2,34)} = -0.53$ ,  $r^2 = 0.49$ ,  $p = 0.002$ ), and Professionalism ( $b_{(2,34)} = -0.79$ ,  $r^2 = 0.77$ ,  $p = 0.000$ ). The average length of the patient encounter did not explain a significant amount of the variance in the number of times Interprofessional Education and Collaborative Practice ( $b_{(2,34)} = -0.15$ ,  $r^2 = 0.01$ ,  $p = 0.514$ ) or Use of Healthcare Informatics ( $b_{(2,34)} = -0.32$ ,  $r^2 = 0.16$ ,  $p = 0.129$ ) were implemented.

#### *Frequency of Patient Encounters by Student*

Students encountered a range of two to 240 patients each. The total number of patient encounters by each student ( $M = 74.2 \pm 59.2$ ) was found to be positively related to the implementation of the total number of Core Competencies ( $b_{(1, 35)} = 0.85$ ,  $r^2 = 0.79$ ,  $p = 0.000$ ). The total number of patient encounters by each student was also found to be positively related to the average number of Core Competencies implemented per student

$(b_{(1, 35)} = 4.85, r^2 = 0.16, p = 0.016)$ . The total number of patient encounters was also positively related to implementation of five of the six individual Core Competencies: Patient-Centered Care  $(b_{(1, 35)} = 0.81, r^2 = 0.66, p = 0.000)$ , EBP  $(b_{(1, 35)} = 0.55, r^2 = 0.31, p = 0.000)$ , Quality Improvement  $(b_{(1, 35)} = 0.77, r^2 = 0.59, p = 0.000)$ , Use of Healthcare Informatics  $(b_{(1, 35)} = 0.48, r^2 = 0.23, p = 0.003)$ , and Professionalism  $(b_{(1, 35)} = 0.99, p = 0.000)$ . The number of the patient encounters did not explain a significant amount of the variance of implementation of Interprofessional Education and Collaborative Practice  $(b_{(1, 35)} = 0.06, r^2 = 0.00, p = 0.734)$ .

#### *Student Role per Encounter*

The role of the student during patient encounters was found to be significantly related to their ability to implement the total number of Core Competencies ( $F = 103.48, p = 0.000$ ). Pairwise comparisons further indicated that those who Observed patient encounters were likely to implement fewer total Core Competencies than those who Assisted in the patient encounter ( $M\ diff = -0.29, p = 0.000$ ), but were likely to implement more Core Competencies than those who selected the role of Other ( $M\ diff = 0.44, p = 0.000$ ). Additionally, those who Assisted during the patient encounter were likely to implement more total Core Competencies than those who solely Performed the patient encounter ( $M\ diff = 0.32, p = 0.000$ ) or those who selected the role of Other ( $M\ diff = 0.29, p = 0.000$ ).

When inputting each individual patient encounter students selected the role that they fulfilled during the encounter, and then selected a dichotomous (yes, no) radio button option for each of the Core Competency categories as to whether or not the student believed they had implemented that competency during the patient encounter.

When examining the student role's relationship with competency implementation the role of Assisted was used as the comparison, or omitted, variable. Odds ratios for the student roles are also detailed in Table V.A.6

For Patient-Centered Care (*Nagelkerke*  $R^2 = 0.17$ ) those who Observed patient encounters ( $\beta = -1.21$ , Wald  $\chi^2(1) = 9.36$ ,  $p = 0.002$ ) had a significantly lower odds ratio ( $B = 0.30$ ) of implementing the competency during patient encounters than those who Assisted. The students who Performed patient encounters ( $\beta = -2.21$ , Wald  $\chi^2(1) = 35.00$ ,  $p = 0.000$ ) had an even lower odds ratio ( $B = 0.11$ ) of implementing Patient-Centered Care, and those that selected Other ( $\beta = -3.31$ , Wald  $\chi^2(1) = 79.47$ ,  $p = 0.000$ ) as a role had the lowest odds ratio ( $B = 0.04$ ) of implementing Patient-Centered Care as compared with those who Assisted. In other words, students who Assisted were more likely to complete the Patient-Centered Care competency than those who Observed or had Other roles. Students who had dual roles in encounters (Other) were more likely to complete Patient-Centered Care than those who selected Performed.

For Interprofessional Education and Collaborative Practice (*Nagelkerke*  $R^2 = 0.03$ ) those who Observed patient encounters ( $\beta = 0.04$ , Wald  $\chi^2(1) = 0.11$ ,  $p = 0.739$ ) or Performed patient encounters ( $\beta = 0.16$ , Wald  $\chi^2(1) = 1.81$ ,  $p = 0.179$ ) did not have significantly different odds ratios than those who Assisted of implementing the competency. Those that selected Other ( $\beta = -0.78$ , Wald  $\chi^2(1) = 25.30$ ,  $p = 0.000$ ) as a role had a significantly lower odds ratio ( $B = 0.46$ ) of implementing Interprofessional Education and Collaborative Practice as compared with those who Assisted. Thus, students who Assisted were more likely to complete the Inter-professional competency than those who had dual (Other) roles.



For EBP (*Nagelkerke*  $R^2 = 0.15$ ) those who Observed patient encounters ( $\beta = 0.28$ , Wald  $\chi^2(1) = 6.05$ ,  $p = 0.014$ ) had a significantly higher odds ratio ( $B = 1.32$ ) of implementing the competency than those who Assisted. The students who selected Other as a role ( $\beta = -1.79$ , Wald  $\chi^2(1) = 172.05$ ,  $p = 0.000$ ) had a significantly lower odds ratio ( $B = 0.17$ ) of implementing EBP than those who Assisted. Those who Performed the patient encounter ( $\beta = -0.07$ , Wald  $\chi^2(1) = 0.43$ ,  $p = 0.511$ ) did not have a significantly different odds ratio than those who Assisted of implementing the EBP competency. Simply, students who Observed or selected Other were more likely to complete the Evidence Based Practice competency than those who Assisted.

For Quality Improvement (*Nagelkerke*  $R^2 = 0.07$ ) those who Observed patient encounters ( $\beta = 0.07$ , Wald  $\chi^2(1) = 0.191$ ,  $p = 0.662$ ) did not have a significantly different odds ratio of implementing the competency compared with those who Assisted. The students who Performed the patient encounter ( $\beta = -1.06$ , Wald  $\chi^2(1) = 54.16$ ,  $p = 0.000$ ) and those who selected Other ( $\beta = -1.07$ , Wald  $\chi^2(1) = 46.73$ ,  $p = 0.000$ ) had a significantly lower odds ratio ( $B = 0.35$  and  $B = 0.34$ , respectively) of implementing Quality Improvement than those who Assisted. In other words, students who Assisted were more likely to complete the Quality Improvement competency than those who selected Performed or dual (Other) roles.

For Use of Healthcare Informatics (*Nagelkerke*  $R^2 = 0.11$ ) those who Performed patient encounters ( $\beta = -0.11$ , Wald  $\chi^2(1) = 1.03$ ,  $p = 0.309$ ) did not have a significantly different odds ratio of implementing the competency compared with those who Assisted. The students who Observed patient encounters ( $\beta = -1.17$ , Wald  $\chi^2(1) = 114.53$ ,  $p = 0.000$ ) and those who selected Other ( $\beta = -1.35$ , Wald  $\chi^2(1) = 107.13$ ,  $p = 0.000$ ) had a

significantly lower odds ratio ( $B = 0.31$  and  $B = 0.26$ , respectively) of implementing Use of Healthcare Informatics than those who Assisted. Thus, students who Assisted were more likely to complete the Use of Healthcare Informatics competency than those who Observed or had Other roles.

For Professionalism (*Nagelkerke*  $R^2 = 0.03$ ) those who Performed patient encounters ( $\beta = -0.88$ , Wald  $\chi^2(1) = 1.74$ ,  $p = 0.188$ ) or selected the role of Other during patient encounters ( $\beta = 0.13$ , Wald  $\chi^2(1) = 0.02$ ,  $p = 0.886$ ) did not have significantly different odds ratios than those who Assisted of implementing the competency. Those that Observed patient encounters ( $\beta = -1.30$ , Wald  $\chi^2(1) = 4.18$ ,  $p = 0.041$ ) as a role had a significantly lower odds ratio ( $B = 0.27$ ) of implementing Professionalism as compared with those who Assisted. Simply put, students who Assisted were more likely to complete the Professionalism competency than those who Observed.

#### *Clinical Site per Encounter*

The Clinical Site of the patient encounter as reported by the students was categorized into two groups: University/College (1927 encounters) or High School (806 encounters). 11 encounters that occurred in Other locations (i.e. student health clinics or physicians' offices) were not utilized during this analysis. Clinical site was significantly related to the sum of the Core Competencies implemented per encounter ( $F = 4.413$ ,  $p = 0.036$ ).

University/College setting was selected as the basis for comparison for the binary logistic regressions when examining the implementation of each of the individual Core Competency categories based on the Clinical Site of the patient encounter as reported by the student. The odds ratios for the Clinical site are also detailed on Table V.A.7.

For Patient-Centered Care (*Nagelkerke*  $R^2 = 0.07$ ) those whose encounters occurred at a High School ( $\beta = 1.85$ , Wald  $\chi^2(1) = 52.81$ ,  $p = 0.000$ ) had a significantly higher odds ratio ( $B = 6.37$ ) of implementing the competency than those whose encounters occurred at a University/College site. Thus, those whose clinical encounters occurred at High School were more likely to implement Patient-Centered Care than those at the University/College.

For Interprofessional Education and Collaborative Practice (*Nagelkerke*  $R^2 = 0.03$ ) those whose patient encounters occurred at a High School ( $\beta = -0.68$ , Wald  $\chi^2(1) = 44.12$ ,  $p = 0.000$ ) had a significantly lower odds ratio ( $B = 0.51$ ) of implementing the competency than those whose encounters were reported at a University/College site. Consequently, those whose encounters occurred at University/College were more likely to implement this Core Competency.

For EBP (*Nagelkerke*  $R^2 = 0.002$ ) those whose patient encounters occurred at High Schools ( $\beta = 0.18$ , Wald  $\chi^2(1) = 4.14$ ,  $p = 0.042$ ) had a higher odds ratio ( $B = 1.19$ ) of implementing EBP than those at a University/College site. Hence, those whose encounters occurred at University/College sites were less likely to implement EBP.

For Quality Improvement (*Nagelkerke*  $R^2 = 0.001$ ) there were no significant differences in the odds ratios of competency implementation for patient encounters at a High School ( $\beta = 0.16$ , Wald  $\chi^2(1) = 2.27$ ,  $p = 0.132$ ) as compared to those that took place at a University/College site. Therefore, there were no differences in the likelihood of Quality Improvement implementation based on clinical site.

For Use of Healthcare Informatics (*Nagelkerke*  $R^2 = 0.031$ ) encounters that occurred at a High School ( $\beta = -0.68$ , Wald  $\chi^2(1) = 61.73$ ,  $p = 0.000$ ) had a significantly

decreased odds ratio ( $B = 0.51$ ) of implementing the competency as compared to those at a University/College site. Ergo, those whose encounters occurred at the University/College were more likely to implement Use of Healthcare Informatics than those at a High School.

For Professionalism (*Nagelkerke*  $R^2 = 0.008$ ) there were no significant differences in the odds ratio of competency implementation for encounters that occurred High Schools ( $\beta = 0.70$ , Wald  $\chi^2(1) = 2.00$ ,  $p = 0.157$ ) than those at a University/College site. Simply put, there were no differences in the likelihood of implementation of Professionalism relative to site.

*Frequency, Length, Role and Site on Core Competency Implementation per student*

The model of all independent variables (frequency of patient encounter, average length of patient encounter, modal role of student, and clinical site type) was found to be significantly related to the total implementation of Core Competencies ( $F = 22.94$ ,  $p = 0.000$ ,  $r^2 = 0.74$ ). However, frequency of patient encounters was the only significant variable in this model ( $b_{(4,32)} = 3.34$ ,  $t = 9.46$ ,  $p = 0.000$ ). Consequently, when examined in a singular model, frequency of patient encounters was the only significantly related variable to total Core Competency implementation (See Table V.A.8).

## Discussion

### *Student Role*

The Role of the student was related to the total number of Core Competencies implemented. Those who Assisted with patient encounters were more likely to implement more of the Core Competencies than those who Performed the encounter, Observed the encounter, or fulfilled a combination of these roles (Other). It has been reported that the

interaction with the Preceptor during clinical education experiences significantly impacts the learning and satisfaction of the experience of the student.<sup>15-17</sup> It is possible that this highlights the overall importance of the Preceptor's role in clinical education and the attainment of proficiency in the Core Competencies during patient encounters. The accreditation Standards require that during clinical education the Preceptor must be physically present and able to intervene on behalf of the student and the patient.<sup>7</sup> It has been identified in other healthcare professions that in order for students to learn about the Core Competencies during clinical rotations, the Preceptor must purposefully introduce and reinforce those Competencies during patient interactions.<sup>13</sup> If a student was observing patient encounters, they are likely watching their Preceptor perform the components of the encounter, which may limit their interaction with the patient, the patient's other healthcare providers, and also limit's their input to the clinical decision making process; all of which would contribute to some of the Core Competency implementation. On the extreme opposite end, if the student is performing the encounter independently, they may not be consciously attempting to reinforce the Core Competencies within the encounter without a Preceptor purposefully encouraging them to do so. By assuming the role of Assisting during a patient encounter it appears that the interaction between Preceptor and student allowed for the greatest implementation of the total number of Core Competencies.

#### *Patient-Centered Care*

Similar to the findings of this study, Patient-Centered Care has been reported by students and faculty as the most likely Core Competency to be implemented in nursing education programs.<sup>10</sup> The implementation of the Patient-Centered Care competency was

less likely to occur as the average length of the patient encounter increased. Conversely, as the average frequency of patient encounters increased so did the frequency with which Patient Centered Care was implemented. The implementation of this competency was also related to the role of the student during the patient encounters. Students who Assisted during patient encounters were approximately 3.3 times more likely to implement this competency than those who Observed, 9.1 times as likely to implement patient-centered care as those who actually Performed the encounter, and 25 times more likely to implement patient-centered care than those who identified their role as Other. This finding highlights that the importance of attaining competency within clinical education may not solely surround the number of skills actually performed by the student, but more in the purposeful, active educational process of learning from a Preceptor or mentor during the encounter.

Based on these findings the clinical education experience that results in increased implementation of Patient-Centered Care are those that provide increased patient frequency, without lengthened patient encounter times, and that allow for the student to assist with the patient encounter. This competency's implementation was influenced by the Clinical Site Assignment with students assigned to a high school demonstrating a higher odds ratio of implementation, although in actual practice this equates to the student in the High School setting being only 0.2 times more likely to implement the competency into a patient encounter than those at the University/College setting. Therefore, until this relationship is evaluated on a larger scale this may not translate into an implication at the practical level.

#### *Inter-professional Collaboration*

The implementation of the Interprofessional Education and Collaborative Practice Core Competency was not related to the average length of time of patient encounters, nor the frequency of patient encounters. In nursing education it was found that only about half of students and faculty were able to integrate interdisciplinary care.<sup>10</sup> This same study additionally found that lack of inter-professional collaboration was identified as the single largest barrier to providing patient-centered care.<sup>10</sup> This finding indicates a need for Athletic Training Program personnel to seek out specific encounters and Clinical Sites to allow students to interact clinically with other healthcare professionals. In this study, of the 2744 encounters only 11 encounters were reported outside of the traditional academic Athletic Training settings. The accreditation Standard currently requires that students receive a Clinical Education experience that exposes them to a variety of health care professions.<sup>7</sup> Per the documentation provided by the Program Director, none of the participated students were specifically assigned to non-Academic sites for the whole semester of the semester examined during the data collection timeframe. Our findings indicate that if not intentionally assigned to clinical experiences designated for Interprofessional Education and Collaborative Practice, it is unlikely that these interactions will occur organically in an academic site.

The only student role that impacted the implementation of Interprofessional Education and Collaborative Practice was the Other role, during which a student is 2.2 times less likely to implement this competency than those who Assisted. The implementation of this particular competency was twice as likely to happen at the University/College setting as compared to the high school, which can possibly be attributed to most post-secondary athletic programs being more likely to have physicians

that frequently treat patients on site, and therefore AT students would have the opportunity to interact with them more often.

Notably there was minimal to no relationship between the examined variables and the implementation of Interprofessional Education and Collaborative Practice. It has been determined previously that it is possible that this Core Competency is more easily coordinated at the graduate level of education, and also within departments that contain other allied health educational programs,<sup>18</sup> and as the participant sample that completed this study was within an Undergraduate program within a School of Kinesiology, it is possible that this may have impacted these results. Additionally, experiences that were didactic in nature within the AT Program that may have involved personnel from other healthcare professions were not included within this reported data. However, these findings do bring to light the need to for programs to purposefully seek out opportunities for students to participate in interprofessional treatment teams within clinical practice.

#### *Evidence-Based Practice*

Translation of EBP from didactic to clinical education experiences can be challenging as has been reported both in athletic training and nursing education.<sup>10,19-23</sup> In this study the implementation of EBP was related to both the length and frequency of patient encounters. Students who spent more time with patients on average reported a decreased number of times that they implemented EBP, while those who saw a higher patient volume were more likely to implement this Core Competency. The results also indicate that the role of the student was related to the implementation of EBP. While those who Observed patient encounters were statistically more likely to implement this Core Competency than those who Assisted in encounters this actually equated to those



who Observed being 0.75 times more likely to implement EBP, so this may not be clinically relevant in practice until it is evaluated on a larger scale. Those who selected a dual role (Other) were 5.8 times less likely than those who Assisted to implement EBP, and there were no differences in the likelihood of implementing EBP between those who Assisted and those who Performed the patient encounter. This again may highlight the importance of supervised, progressively autonomous, clinical practice with a Preceptor that engages the student during the patient encounter. The odds of EBP implementation did not vary between University/College setting and encounters that occurred at the High School setting.

Overall these findings indicate that EBP is most frequently implemented in academic settings when patient encounters are more frequent, but not necessarily longer in length. There is a relationship with the role that the student plays in the interaction, but this may need to be examined more in the future.

### *Quality Improvement*

Quality improvement was also inversely related to the length of patient encounters, and was also positively related to the frequency of patient encounters once again highlighting the need for students to have a higher volume of patient encounters within their Clinical Education experiences to allow for greater implementation of this competency. The students who Assisted with patient encounters were 2.9 times more likely to implement Quality Improvement than both those who Performed the patient encounter and those who selected the role of Other. There was no difference in the odds of Quality Improvement implementation for those who Observed the patient encounter as compared to those who Assisted. This continues to emphasize the importance of the

Preceptor interaction within patient encounters as students who are assisting their Preceptor in the provision of care to patients are more likely to report their participation in the competency implementation process. There were no differences in Quality Improvement Implementation between the Clinical Site types evaluated in the study.

Overall, an increase in the implementation of Quality Improvement is likely to be seen in Clinical Education experiences that allow for higher patient frequency, as well as when a Preceptor engages the student to assist in the patient encounter, but not necessarily experiences designated at specific Site types. Quality Improvement as a competency is intended to be cyclical and reflective in nature, allowing for reflection of changes made, and analysis of outcomes. It is possible that measuring this competency in terms of individual patient encounters may limit the applicability of these findings.

#### *Use of Healthcare Informatics*

Use of Healthcare Informatics implementation was not related to the length of patient encounter. As Use of Healthcare Informatics is a competency that is technologically focused in nature, it is possible that it is performed outside of the physical presence of the patient, and therefore students didn't report it as part of the patient encounter. Use of Healthcare Informatics implementation was related to the number of patient encounters. Students who catalogued more patient encounters were more likely to implement this competency. The methodological design of this study required the Use of Healthcare Informatics as part of the data collection process and this should be considered when examining the results however, the collection process utilized what was essentially an electronic medical record software program, so as students reported more encounters they were in fact implementing this competency, therefore validating the

findings. Students who Assisted and Performed patient encounters did not differ in their implementation of the Use of Healthcare Informatics, but those who Observed patient encounters were 3.2 times less likely, and those who selected the role of Other were 3.8 times less likely, to implement Use of Healthcare Informatics than those who Assisted. Similar to aforementioned competencies this again underlines the importance of Preceptor engagement and having progressively autonomous, supervised Clinical Education.

### *Professionalism*

The implementation of Professionalism was related to the length and frequency of patient encounters. Students who have the opportunity to participate in the patient care for a higher volume of patients were more likely to implement Professionalism, but those who averaged longer time with patients reported implementation of Professionalism less frequently. Students who Observed patient encounters were 3.7 times less likely to implement Professionalism than those who Assisted, once again accentuating the need for actual engagement in the patient treatment process in order to implement Core Competencies. The Clinical Site at which the encounter occurred did not relate to the implementation of this Core Competency, continuing to draw attention to the lack of potential importance of site type, and the need for increased focus on patient volume, and student engagement regardless of the site.

### *Patient Encounter Length*

When examining the Core Competency implementation of the students it was first determined that the sum total of Core Competencies that were implemented were related to the length of time that students spent with patients. An inverse relationship existed between the length of time a student spent with a patient and the total number of Core

Competencies that were implemented. The average patient encounter per student was just under 20 minutes and the average number of Core Competencies that were reported as implemented was four. This inverse relationship existed by individual competency as well. As the average length of time spent with patients increased, students reported a decreased number of times that they were able to implement Patient-Centered Care, EBP, Quality Improvement, and Professionalism. This finding supports the existing evidence that suggest students benefit from purposeful, quality, clinical education experiences as opposed to accumulating a quantity of hours or time at Clinical Education sites.<sup>14,15,24,25</sup>

This finding should also be evaluated in the context of the potential total Core Competencies that can actually be implemented. There are only six Core Competencies that can possibly be implemented in a single patient interaction. Hypothetically, using a one hour time frame, if student A spends 60 minutes with a patient there is only a possibility of implementing each of the Core Competencies once. Conversely if student B spends an average of 20 minutes per patient, and therefore has three patient encounters in the provided timeframe, this student has the possibility of implementing each of the Core Competencies three times, for a total of 18 possible implementations. This consideration is supported by the determined lack of relationship between the average length of patient encounters and the average number of Core Competencies implemented by students. Students who averaged shorter patient encounters average the same number of Core Competencies as those with longer patient encounters, but overall for the semester had more implementations of the Core Competencies. If AT students are fulfilling an hour quota at clinical education, those who have a higher frequency of patient interaction likely spend proportionally less time with patients, and therefore have a higher rate of

Core Competency implementation. This highlights the potential need for students to track patient frequency versus hours completed at clinical education if Core Competency exposure is an associated goal. However, it is also important to consider that the depth and quality of Core Competency implementation was not measured during this study, and therefore the value of that variable is unknown.

#### *Patient Encounter Frequency*

The relationship noted with number (frequency) of patient encounters and total number of Core Competencies implemented was the opposite of that for length. As the average number of encounters increased, so did the total number of Core Competencies that could be implemented. This was mirrored in the examination of the average number of Core Competencies implemented. Students in nursing and physician assistant education programs have reported that having more opportunities to practice skills ultimately correlates to improvement in competency.<sup>10,11</sup> This finding implicates that those who are responsible for assigning Clinical Education experiences for students should be monitoring the frequency of patient encounters that students are exposed to if a goal of the experience is to implement any of the Core Competencies, and encourage the use of clinical education experiences that have a higher frequency with regard to patient flow and interaction.

When examined in one model incorporating all of the independent variables, patient frequency was the single significant variable that related to total Core Competency implementation explaining 74% of the variance in implementation. Consequently, this finding suggests that the aims of clinical education should be directed at obtaining an increased number of patient encounters for students in order to provide

them the most opportunities for Core Competency implementation, although, as mentioned previously, more frequent implementation may not always equate to quality implementation.

### Limitations and Suggestions for Future Research

As a pilot study this data collection utilized one professional AT Program. While the findings are significant, and potentially impact the manner in which program personnel examine and evaluate Clinical Education, the findings may not be universally applicable across all programs until evaluated on a larger scale. Additionally data collection was solely reliant on the consistent reporting of encounters by the students, and did not incorporate the perception of Core Competency implementation from the Preceptors, which may also have impacted these findings.

Future research should examine these variables across a larger programmatic population, including post-baccalaureate level professional programs, to determine applicable relevance to all AT programs. Additionally, as this study was conducted over the course of a semester, future research should consider a more longitudinal approach to evaluating patient encounters over the course of student progression through Clinical Education. In addition to tracking how patient encounters impact Core Competency implementation, future studies should also examine how patient encounters are related to student perception of competence and change in competence over time in the realms of the Core Competencies. Lastly, as Preceptor assistance in patient encounters was identified as a factor in student Core Competency implementation, future research should examine the student to Preceptor ratio that best supports preceptor mentorship in the clinical education experience, as well as examine the Preceptors' perception of Core

Competency implementation to better validate the accuracy of the student understanding of when the Core Competencies are actually being incorporated to patient care.

### Conclusions

Our findings indicate that implementation of the majority of the Core Competencies was related to the frequency of patient encounters. Students who had the opportunity to interact with a higher patient volume were more likely to implement the Core Competencies as a whole. Athletic Training programs should be monitoring patient encounter volume to ensure students receive quality Clinical Education experiences over quantity of hours accumulation.

Clinical Education experience Sites should be evaluated based on the patient volume to determine if the experience is valuable if a goal of a Clinical Education experience is to allow students the opportunity to implement the Core Competencies.

The student role of Assisted was more likely to result in the implementation of some of the Core Competencies than those who Observed and those who Performed the patient encounter. This underscores the importance of the interaction and guidance of a Preceptor who engages the student within the Core Competencies, and the true need for supervised Clinical Education experiences. AT program personnel should evaluate Preceptors on a regular basis to determine how effectively the engagement process is being incorporated into patient encounters and ensure that the Preceptors are educating on how to best implement the Core Competencies while interacting with the students. Preceptor training should incorporate instruction on how to facilitate patient encounters to allow greater opportunity for students to assist the Preceptor throughout the time spent with the patient.

With the exception of EBP, there were minimal to no relationships between the Clinical Site at which the patient encounters occurred and Core Competency implementation, emphasizing the greater importance of what is happening to the student at the Clinical Site relative to patient encounters rather than the importance of the type of site at which the encounter occurs. The role of the student during patient encounters and the volume of patient encounters should be considered as a priority for students to allow greater Core Competency implementation rather than seeking specific types of Clinical Education sites.



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**Table V.A.1: Student Participant Demographic Data**

	First Year	Second Year	Third Year	Overall
Participants	12	14	14	40
Gender				
Male	2	3	4	9
Female	10	11	10	31
Age (M $\pm$ SD)	19.83 $\pm$ 1.70	20.79 $\pm$ 1.53	21.21 $\pm$ 0.43	20.65 $\pm$ 1.41
Setting				
University	11	10	10	31
High School	1	4	4	9

**Table V.A.2: Core Competency Question Block**

1. Were you able to implement the patient-centered care competency during this patient encounter? (yes/no)
2. Were you able to implement the inter-professional collaboration competency during this patient encounter? (yes/no)
3. Were you able to implement the evidence-based practice competency during this patient encounter? (yes/no)
4. Were you able to implement the quality improvement competency during this patient encounter? (yes/no)
5. Were you able to implement the informatics competency during this patient encounter? (yes/no)
6. Were you able to implement the professionalism competency during this patient encounter? (yes/no)

**Table V.A.3: Descriptive Data for Core Competency Implementation**

Dependent Variable	Description	Variables	Number	%	Mean	SD
Sum of Core Competency Implementation	Per a patient encounter, (range 0-6)	Total	2744	100	4.04	1.37
		0	9	0.3		
		1	228	8.3		
		2	51	1.9		
		3	554	20.2		
		4	771	28.1		
		5	788	28.7		
Ability to Implement the Patient-Centered Care Competency	Per a patient encounter, (No = 0, Yes =1)	No	251	9.1	0.91	0.29
		Yes	2493	90.9		
Ability to Implement the Interprofessional Collaboration Competency	Per a patient encounter, (No = 0, Yes =1)	No	1986	72.4	0.28	0.45
		Yes	758	27.6		
Ability to Implement the Evidence-based Practice Competency	Per a patient encounter, (No = 0, Yes =1)	No	1099	40.1	0.6	0.49
		Yes	1645	59.9		
Ability to Implement the Quality Improvement Competency	Per a patient encounter, (No = 0, Yes =1)	No	553	20.2	0.8	0.4
		Yes	2191	79.8		
Ability to Implement the Informatics Competency	Per a patient encounter, (No = 0, Yes =1)	No	1470	53.6	0.46	0.5
		Yes	1274	46.4		
Ability to Implement the Professionalism Competency	Per a patient encounter, (No = 0, Yes =1)	No	29	1.1	0.99	0.1
		Yes	2715	98.9		

**Table V.A.4: Descriptive data for Patient encounter frequency and length.**

Independent Variable	Description	Range	Number	%	Mean	SD
Patient Encounter Frequency	Number of patient encounters each student had during semester	2-240	2744		74.2	59.3
Patient Encounter Length	Length of time patient encounters lasted (Minutes)	0-420	2774		19.29	23

**Table V.A.5: Descriptive data for role and site per patient encounter.**

	Number	Percentage
<b>Student Role</b>		
Observed	865	3.15
Assisted	601	21.9
Performed	781	28.5
Other	474	17.3
<b>Clinical Site Assignment</b>		
University	1927	70.2
High School	806	29.4
Clinic/Other	11	0.4



**Table V.A.6: Odds Ratio for Student Role as compared to the Assisted Role**

	Observed			Performed			Other		
	Odds Ratio (B)	<i>p</i> value	Likelihood	Odds Ratio (B)	<i>p</i> value	Likelihood	Odds Ratio (B)	<i>p</i> value	Likelihood
Patient Centered Care	0.3	0.002	3.33	0.11	0.000	9.09	0.04	0.000	25
Interprofessional Education and Collaborative Practice	1.04	0.739		1.17	0.179		0.46	0.000	2.17
Evidence-Based Practice	1.32	0.014	0.75	0.93	0.511		0.17	0.000	5.88
Quality Improvement	1.07	0.662		0.35	0.000	2.86	0.34	0.000	2.94
Use of Healthcare Informatics	0.31	0.000	3.23	0.89	0.309		0.26	0.000	3.85
Professionalism	0.27	0.041	3.7	0.41	0.188		1.14	0.886	

**Table V.A.7: Odds Ratio for Encounter Clinical Site as Compared to the University/College Site**

	Odds Ratio ( <i>B</i> )	High School	
		<i>p</i> value	Likelihood
Patient Centered Care	6.37	0.000	0.16
Interprofessional Education and Collaborative Practice	0.51	0.000	1.96
Evidence-Based Practice	1.19	0.042	0.84
Quality Improvement	1.18	0.132	
Use of Healthcare Informatics	0.51	0.000	1.96
Professionalism	2.02	0.157	

**Table V.A.8: Frequency, length, role, and site on total Core Competency implementation per student**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	59.898	54.450		1.100	.280
Average time spent per encounter	1.010	1.711	.054	.590	.559
Modal Role of student	-21.320	19.780	-.101	-1.078	.289
Clinical Site (modal) where student saw majority of patient encounters	2.005	45.411	.004	.044	.965
Frequency of Patient encounters	3.341	.353	.881	9.458	.000

a. Dependent Variable: Total Competency Implementation

## **Chapter VI**

### **Project IIIB: Perceived improvement in level of Core Competency following a semester of tracking patient encounters: A pilot study**

Title: Perceived improvement in level of Core Competency following a semester of tracking patient encounters: A Pilot Study.

Authors: Julie Cavallario, Bonnie Van Lunen, Johanna Hoch, Matthew Hoch, Sarah Manspeaker, Shana Pribesh

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### Introduction

The majority of health care professions, including athletic training (AT), utilize real-time clinical patient encounters and experiences to provide students the opportunity to learn and practice clinical skills.<sup>1-9</sup> The Institute of Medicine (IOM) has indicated a need for an overhaul of the health care system to improve patient outcomes; change that would incorporate Core Competencies and that are suggested for adoption by all health care practitioners.<sup>10,11</sup>

These Core Competencies, which include providing Patient Centered Care, Inter-professional Education and Collaborative Practice, Evidence Based Practice (EBP), Quality Improvement, Healthcare Informatics, and Professionalism, are currently a required component of the education of athletic trainers at the post-professional and residency levels,<sup>12,13</sup> but are not currently a required component of the education at the professional level,<sup>14</sup> despite recommendations to do so.<sup>10,11,15</sup> Comparatively, nursing and physician assistant programs have documented attempts to integrate these competencies into the curriculum for the preparation of the professional practitioner.<sup>4,5</sup>

In AT, as well as other health care professions, clinical education is the section of curriculum in which the didactically incorporated educational theories and guidelines are incorporated in actual patient care.<sup>9</sup> This is the portion of the AT students' education in which they learn about how to provide quality patient care, thus implicating the need to incorporate these Core Competencies in the professional level education requirements however, it is still unclear as to how to evaluate student experiences to determine their level of exposure to and mastery of the Core Competencies. Existing studies indicate that AT students find clinical education to be a better experience when it is based on

experiences obtained, rather than hour requirement fulfillment,<sup>1,2,16</sup> and when it is completed with an engaged preceptor who involves the student in patient interactions.<sup>17,18</sup> Relative to the Core Competencies, it has been determined that a higher frequency of patient encounters results in greater implementation of the Core Competencies in AT clinical education.<sup>19</sup>

Lacking from the existing research is evidence that implementation and practice of these Core Competencies results in a change in students' perception of their abilities in the Competency areas. This has been examined in a limited basis at the post-professional level, but not yet at the professional level.<sup>20</sup> Therefore, the purpose of this study was to determine to what extent students' perceived level of improvement in each of the six Core Competencies was related to specific aspects of the patient encounter, namely the frequency and length of patient encounters, as well as the role and year within the program of the student during encounters, and the clinical site at which encounters occurred.

## Methods

### *Design*

This study utilized a Panel Design which tracked a cohort of students over the course of one academic semester.

### *Participants*

E\*value (Advanced Informatics, Minneapolis, MN) is a software program that provides tracking and record keeping capabilities to healthcare education programs. A list of current Athletic Training Programs that utilize the E\*value software was provided by the software company and purposeful sampling was utilized to recruit an institution willing to participate. Professional AT programs that utilized the software were contacted

to determine the extent of utilization of the program, specifically the aspects related to tracking patient encounters. Once a program that met the minimal requirements for E\*Value utilization agreed to participate recruitment was stopped. The selected program was within an NCAA Division I Institution with Carnegie Classification of RU/VH (very high research activity). The participating program was already utilizing E\*value and was minimally requiring their students to record the number of patient encounters, the type of patient encounter, and the level of supervision of those encounters by their preceptor. The participating program's Program Director also provided the student list by year within the program, as well as each student's assigned clinical site for the semester. The participating program conducts a three year professional phase as part of their overall curriculum. All students (N = 42) enrolled in the professional phase of the program were asked to participate. Informed consent forms were signed by the participating program's Program Director, and the students who agreed to participate (N=40). Approval for this study was obtained from the Human Subjects Research Committee within the Darden College of Education at Old Dominion University (#201403008), as well as the participating Institution's Institutional Review Board (#E8858).

### *Instrumentation*

In order to assess students' perceived changes in perceived clinical competence, a modification of the Educational Core Competencies survey developed by Van Lunen, McCarty & Hankemeier<sup>20</sup> was used (Appendix A). The original survey asked the student to evaluate their perceived current level of competence in the six categories, and the modification to the survey added the section asking the student to rate their perceived level of improvement for each question as well. The perceived improvement section was

completed at the end of the clinical experience. This survey encompassed examination of six Core Competencies (Evidence-based Practice, Professionalism, Quality Improvement, Interprofessional Education and Collaborative Practice, Patient-Centered Care, Use of Healthcare Informatics) by asking students to rate on a Likert scale their perceived improvement since the start of the clinical experience in competence and confidence in several areas within each competency. Students assessed their improvement on a continuum where 1= No Improvement and 4 = Significant Improvement. Internal reliability of the survey questions was found to be good, and the reliability analysis of the survey scale items is reported in Table VI.A.1. Prior to the start of the semester the primary researcher provided a 20-minute recorded educational program to the participating program's Program Director that students viewed during a program meeting prior to the start of their clinical experience. This was a planned programmatic meeting at which the Program Director required attendance and oversaw the delivery of the educational materials. This educational session was included to ensure that all participating students had the same minimal baseline level of knowledge and understanding of the components of each of the six Core Competency areas. The materials were further posted in an online format that the students had access to throughout the course of the semester to reference as needed to review elements of each of the Core Competency areas as they catalogued their ongoing patient encounters. These data were collected as part of a larger study that included tracking patient encounters. Although 40 students began the clinical program, only 33 completed the final survey and were used in these analyses (N=33).



The internet based computer program, E\*value, was used to track patient encounters. Minimal usage of the software's available tracking mechanisms included indicating that a patient encounter occurred, what type of encounter occurred, the type of procedures performed on the patient for that encounter, and the level of autonomy the student performed at. From these data, the average length of a patient encounter was determined for each student as well as the number of encounters each student had. An additional block of questions was created within the patient encounter reporting page (Table VI.A.2). The student was able to select the role they fulfilled for each patient encounter. The student could input Observed, Assisted, or Performed, but also could select Other or any combination (i.e. observed and assisted, or performed and other) of the four aforementioned roles. For the purpose of this study the students who input any combinations of roles for any encounters were all placed into the Other category. From encounter data, the modal role each student fulfilled was calculated. The students also had the opportunity to input their Clinical Site type when documenting patient encounters. Selections consisted of College/University, High School, Clinic, Health Services, Physician Office, etc. Students who selected Clinical Sites for a patient encounter that was not either a College/University or High School were assigned to the Other group ( $N=11$  encounters).

#### *Collection Procedure*

Patient encounters were tracked daily throughout the fall 2014 semester. The Program Director monitored student encounter data input and reminded students to input data if they weren't doing so in a timely fashion. Student records were downloaded monthly by the institution's Program Director, and forwarded to the primary investigator.

The Core Competency improvement survey forms were mailed to the Program Director two weeks prior to the end of the semester, who distributed them to students with a 1 week due date for completion, and were mailed back to the primary investigator upon completion.

### *Data Analysis*

Participant responses were uploaded into PASW Statistics (version 21.0, SPSS Inc., Chicago, IL). The competency improvement scale scores were calculated (Table VI.A.2) and evaluated for normal distribution (Table VI.A.3), and were determined to be normally distributed. Descriptive statistics for scale scores of perceived change of competency level were also calculated by student cohort (See Table VI.A.4).

Collinearity diagnostics were run prior to data analysis to determine that none of the independent variables were highly correlated with each other. Descriptive data were tabulated for Core Competency Implementation (total, Professionalism, Quality Improvement, Use of Healthcare Informatics, Interprofessional Education and Collaborative Practice, Evidence-Based Practice, and Patient-Centered Care), as well as for the independent variables (patient encounter frequency, average patient encounter length (in minutes), role of the student, Clinical Site of the encounter, and year in program). These descriptive data are outlined in Tables VI.A.5, VI.A.6, and VI.A.7.

One way between subjects analysis of variance (ANOVA) was utilized to examine if there was a difference between student year and their perceived change in competency level over the course of the semester (see output, Appendix B). ANOVAs were also used to analyze the how the role of the student, as well as the site assignment of the student, during patient encounters impacted the perceived level of improvement of the student for each of the individual Core Competency categories. All post-hoc analyses for

significant main effects were completed using a conservative Bonferroni alpha adjustment.

Multiple linear regressions were used to determine how the length of patient encounters and the frequency of patient encounters impacted the students' perceived level of improvement in each of the Core Competency categories at the end of the semester. Lastly, multiple linear regressions were conducted to determine how all of the independent variables (average patient encounter length, patient encounter frequency, modal student role, and clinical site assignment type) were related within one model to perceived improvements in each of the Core Competency areas. Level of significance for all analyses was set *a priori* at  $\alpha < 0.05$ .

### Results

#### *Student Year (Table VI.A.8)*

Significant differences were noted between student cohorts in their perceived improvement in Core Competency level within Interprofessional Education and Collaborative Practice ( $F = 7.35$ ,  $p = 0.003$ ). Pairwise comparisons indicated that first year students had a significantly higher rate of perceived improvement in Interprofessional Education and Collaborative Practice ( $M = 3.03$ ) than both second year students ( $M = 2.28$ ), ( $p = 0.011$ ) and third year students ( $M = 2.18$ ), ( $p = 0.005$ ), but that no significant difference was detected between second and third year students ( $p = 1.00$ ).

Significant differences were noted between student cohorts in their perceived improvement in competency level for Evidence-Based Practice ( $F = 3.76$ ,  $p = 0.035$ ). However, post-hoc analysis indicated no significant differences existed between first year students ( $M = 3.17$ ) and second year students ( $M = 2.58$ ) ( $p = 0.087$ ), or third year

students ( $M = 2.51$ ), ( $p = 0.061$ ), nor between second and third year students ( $p = 1.00$ ).

This was likely due to the use of a Bonferroni adjustment which lowers the threshold for significance during this analysis from 0.05 to 0.016.

Similarly, significant differences were noted between student cohorts in their perceived improvement in competency level for Patient-Centered Care ( $F = 3.38$ ,  $p = 0.048$ ). However, post-hoc analysis indicated no significant differences existed between first year students ( $M = 3.41$ ) and second year students ( $M = 3.10$ ), ( $p = 0.217$ ) or third year students ( $M = 3.21$ ), ( $p = 0.056$ ), nor between second and third year students ( $p = 1.00$ ).

There were no significant differences between student cohorts in their perceived improvement in competency level within Quality Improvement ( $F = 3.14$ ,  $p = 0.058$ ), Professionalism ( $F = 2.82$ ,  $p = 0.075$ ), or Use of Healthcare Informatics ( $F = 2.65$ ,  $p = 0.087$ ).

#### *Patient Encounter Length by Student*

Multiple linear regressions demonstrated that the average amount of time spent with patients by students did not explain a significant amount of variance in the perceived level of improvement in the Patient-Centered Care ( $p = 0.664$ ), Interprofessional Education and Collaborative Practice ( $p = 0.529$ ), Evidence-Based Practice ( $p = 0.483$ ), Quality Improvement ( $p = 0.536$ ), Use of Healthcare Informatics ( $p = 0.809$ ), or Professionalism ( $p = 0.333$ ) Core Competencies.

#### *Patient Encounter Frequency by Student*

Similarly, frequency of patient encounters did not account for any significant variance in the perceived level of improvement of the Patient-Centered Care ( $p = 0.383$ ),

Interprofessional Education and Collaborative Practice ( $p = 0.623$ ), Evidence-Based Practice ( $p = 0.819$ ), Quality Improvement ( $p = 0.852$ ), Use of Healthcare Informatics ( $p = 0.244$ ), or Professionalism ( $p = 0.762$ ) Core Competencies.

### *Student Role*

The perceived level of improvement in Patient-Centered Care was examined based on the role that the student fulfilled; Observed ( $M = 2.46$ ,  $SD = 0.74$ ), Assisted ( $M = 2.55$ ,  $SD = 0.62$ ), Performed ( $M = 2.62$ ,  $SD = 0.55$ ), and Other ( $M = 2.09$ ,  $SD = 0.66$ ) and was found to be significantly related to the perceived level of improvement of the student ( $F = 42.389$ ,  $p = 0.000$ ). Those who Observed patient encounters perceived less improvement in this competency than those who Performed patient encounters ( $p = 0.000$ ), and those who identified their role as Other ( $p = 0.000$ ). There were no significant differences in perceived improvement between those who Observed and those who Assisted ( $p = 0.434$ ). Those who Assisted similarly perceived less improvement in this competency as compared with those who Performed encounters ( $p = 0.000$ ) and perceived greater improvement than those who identified as Other ( $p = 0.000$ ). Those who Performed the patient encounters perceived greater improvement than those who identified as Other ( $p = 0.000$ ).

The perceived level of improvement in Interprofessional Education and Collaborative Practice was examined based on the role that the student fulfilled; Observed ( $M = 2.46$ ,  $SD = 0.74$ ), Assisted ( $M = 2.55$ ,  $SD = 0.62$ ), Performed ( $M = 2.62$ ,  $SD = 0.55$ ), and Other ( $M = 2.09$ ,  $SD = 0.66$ ). It was determined that student role was significantly related to perceived level of improvement of the student ( $F = 70.60$ ,  $p = 0.000$ ).

Those who Observed patient encounters perceived less improvement in this competency than those who Performed patient encounters ( $p = 0.000$ ), Assisted with patient encounter ( $p = 0.040$ ), or who identified their role as Other ( $p = 0.000$ ). Those who Assisted had no significant difference in perceived level of improvement in this competency compared with those who Performed patient encounters ( $p = 0.314$ ), but did have significantly greater perceived improvement than those who identified their role as Other ( $p = 0.000$ ). Those who Performed the patient encounters also perceived greater improvement than those who identified as Other ( $p = 0.000$ ).

The perceived level of improvement in Evidence-Based Practice was examined based on the role that the student fulfilled; Observed ( $M = 2.76$ ,  $SD = 0.66$ ), Assisted ( $M = 2.78$ ,  $SD = 0.68$ ), Performed ( $M = 2.86$ ,  $SD = 0.55$ ), and Other ( $M = 2.46$ ,  $SD = 0.75$ ). It was determined that the student role was significantly related to perceived level of improvement of the student ( $F = 39.61$ ,  $p = 0.000$ ).

Those who Observed patient encounters perceived less improvement in Evidence-Based Practice than those who Performed patient encounters ( $p = 0.010$ ), and perceived greater improvement than those who identified their role as Other ( $p = 0.000$ ). Those who Assisted and Performed patient encounters both had significantly greater perceived improvement as compared to those who identified their role as Other ( $p = 0.000$  and  $p = 0.000$  respectively).

The perceived level of improvement for Quality Improvement was examined based on the role that the student fulfilled; Observed ( $M = 2.75$ ,  $SD = 0.52$ ), Assisted ( $M = 2.73$ ,  $SD = 0.60$ ), Performed ( $M = 2.94$ ,  $SD = 0.55$ ), and Other ( $M = 2.66$ ,  $SD = 0.80$ )

and was found to be significantly related to perceived level of improvement of the student ( $F = 25.0, p = 0.000$ ).

Those who Observed patient encounters perceived less improvement in this competency than those who Performed patient encounters ( $p = 0.000$ ), and perceived more improvement than those who identified their role as Other ( $p = 0.046$ ). Those who Performed more patient encounters additionally perceived greater improvement as compared to those who identified their role as Assisted or Other ( $p = 0.000$  and  $p = 0.000$  respectively).

The perceived level of improvement for Use of Healthcare Informatics was examined based on the role that the student fulfilled; Observed ( $M = 2.35, SD = 0.66$ ), Assisted ( $M = 2.37, SD = 0.66$ ), Performed ( $M = 2.64, SD = 0.66$ ), and Other ( $M = 2.23, SD = 0.63$ ) and was found to be significantly related to perceived level of improvement of the student ( $F = 45.06, p = 0.000$ ).

Those who Observed patient encounters perceived less improvement in this competency than those who Performed patient encounters ( $p = 0.000$ ), and perceived more improvement than those who identified their role as Other ( $p = 0.009$ ). Those who Performed more patient encounters additionally perceived greater improvement as compared to those who identified their role as Assisted or Other ( $p = 0.000$  and  $p = 0.000$  respectively). Those who Assisted with more patient encounters also perceived greater improvement in Use of Healthcare Informatics than those who fulfilled the Other role ( $p = 0.004$ ).

The perceived level of improvement for Professionalism was examined based on the role that the student fulfilled; Observed ( $M = 2.68, SD = 0.63$ ), Assisted ( $M = 2.78,$

$SD = 0.65$ ), Performed ( $M = 2.88$ ,  $SD = 0.58$ ), and Other ( $M = 2.60$ ,  $SD = 0.55$ ) and was found to be significantly related to perceived level of improvement of the student ( $F = 24.83$ ,  $p = 0.027$ ).

Those who Observed patient encounters perceived less improvement in this competency than those who Performed patient encounters ( $p = 0.000$ ), and those who Assisted in more patient encounters ( $p = 0.006$ ). Those who Performed more patient encounters additionally perceived greater improvement as compared to those who identified their role as Assisted or Other ( $p = 0.030$  and  $p = 0.000$  respectively). Those who Assisted with more patient encounters also perceived greater improvement in Professionalism than those who fulfilled an Other role ( $p = 0.000$ ).

#### *Clinical Site at which Encounters Occurred*

When evaluating perceived improvement in Core Competency categories by Clinical Site at which patient encounters occurred there were no significant findings for Patient-Centered Care ( $F = 1.65$ ,  $p = 0.192$ ), Interprofessional Education and Collaborative Practice ( $F = 2.37$ ,  $p = 0.093$ ), or Evidence-Based Practice ( $F = 2.78$ ,  $p = 0.062$ ) in the perceived level of improvement within these respective Core Competencies.

The perceived level of improvement for Quality Improvement was examined based on the Clinical Site Assignment of the student for University/College ( $M = 2.81$ ,  $SD = 0.65$ ), High School ( $M = 2.72$ ,  $SD = 0.51$ ), and Other ( $M = 2.63$ ,  $SD = 0.42$ ) and was found to be significantly related to perceived level of improvement of the student ( $F = 7.47$ ,  $p = 0.001$ ). Those at the University/College Setting perceived a significantly greater improvement than those at the High School ( $p = 0.000$ ).



The perceived level of improvement for Use of Healthcare Informatics was examined based on the Clinical Site Assignment of the student for University/College ( $M = 2.51$ ,  $SD = 0.61$ ), High School ( $M = 2.19$ ,  $SD = 0.76$ ), and Other ( $M = 2.52$ ,  $SD = 0.25$ ) and was found to be significantly related to perceived level of improvement of the student ( $F = 65.74$ ,  $p = 0.000$ ). Those at the University/College Setting perceived a significantly greater improvement than those at the High School ( $p = 0.000$ ).

The perceived level of improvement for Professionalism was examined based on the Clinical Site Assignment of the student for University/College ( $M = 2.78$ ,  $SD = 0.60$ ), High School ( $M = 2.66$ ,  $SD = 0.64$ ), and Other ( $M = 2.75$ ,  $SD = 0.41$ ) and was found to be significantly related to perceived level of improvement of the student ( $F = 10.00$ ,  $p = 0.000$ ). Those at the University/College Setting perceived a significantly greater improvement than those at the High School ( $p = 0.000$ ).

#### *Frequency, Length, Role, and Site Effects on Perceived Improvement per Student*

Utilizing all four independent variables in a multiple regression, none of the dependent variables explained a significant amount of variance in perceived improvement in any of the six Core Competencies: Patient-Centered Care ( $F = 0.33$ ,  $p = 0.856$ ), Interprofessional Education and Collaborative Practice ( $F = 0.84$ ,  $p = 0.510$ ), Evidence-Based Practice ( $F = 0.70$ ,  $p = 0.600$ ), Use of Healthcare Informatics ( $F = 1.63$ ,  $p = 0.194$ ), Quality Improvement ( $F = 0.36$ ,  $p = 0.833$ ), and Professionalism ( $F = 0.81$ ,  $p = 0.530$ ).

### Discussion

#### *Student Cohort*

The only Core Competency that had significant differences between student cohorts following post-hoc analysis was inter-professional collaboration, with the first year students perceiving the greatest level of improvement. This is likely due to the fact that students entering their first year in the professional phase of a program would have the opportunity to work with other healthcare professions for the first time during this year, and so therefore have the greatest opportunity for improvement, as opposed to students who have had those opportunities previously.

While we hypothesized that first year students would have the largest change in perceived level of improvement across all categories due to an assumed lower baseline starting level in competency, this finding was not supported by our results. There were other significant relationships found during main analyses that weren't present in post-hoc testing, which is in part attributed to the use of a conservative post-hoc adjustment to protect against family-wise error against a smaller sample size (N =10/11 in each group) and an increased number of main analyses. This contributed to the lack of significant findings during post-hoc analysis and is an indication for future research to examine this with a larger sample size.

#### *Patient Encounter Frequency and Length*

Clinical education in AT is a purposefully planned experience that allows the student opportunities within a patient treatment setting to learn and develop skills necessary to be a competent, practicing athletic trainer.<sup>1</sup> In the past there has been a focus on the accumulation of a minimum amount of hours in order to assure attainment of the skills needed to allow an athletic trainer to perform as a competent professional upon graduation.<sup>1,9,21,22</sup> It has been suggested that an increase patient encounters is related to

an increase in Core Competency implementation, and conversely increased patient encounter length is related to a decrease in Core Competency implementation.<sup>19</sup>

Subsequently, we hypothesized that an increase in patient encounter frequency would result in an increase in perceived level of Core Competency improvement, and that increased patient encounter lengths would be related to a decreased perception of Core Competency improvement. However, our findings support the null hypothesis that the length and frequency of patient encounters during a clinical education experience do not relate to an increase or decrease in students' perception of improvement in the Core Competencies. As this was a pilot study in which students were rating their perceived level of improvement over the course of one semester, these findings may provide an indication to study these same variables over the course of the entire professional phase of education for AT students to best measure perceived improvement in the Core Competencies.

### *Student Role*

Some research suggest that the level of engagement of the student is more likely to result in the attainment of skill and a perception of a satisfying clinical education experience for student in athletic training and nursing.<sup>1,3,23</sup> In four of the six Core Competencies (Patient-Centered Care, Quality Improvement, Use of Healthcare Informatics, and Professionalism) students who had more Performed encounters perceived a greater level of improvement than any of the other roles. For the remaining two Core Competencies, Interprofessional Education and Collaborative Practice and EBP, there were no differences in perception between those who Performed or Assisted in encounters, but both of these roles resulted in greater perception of improvement in the

associate Core Competency. This finding indicates that students who have an opportunity to practice their skills independently on patients perceive a greater level of improvement in Core Competencies. It should be noted however, that the Mean scores for perception of Core competency improvement for all roles was between 2.09 and 2.94, which in the Likert scale rating indicates Minimal to Moderate Improvement in all competency areas, so this finding may need to be examined on a larger scale to determine clinical applicability.

*Clinical Site at which encounters occurred*

Quality Improvement, Use of Healthcare Informatics, and Professionalism all had higher perceptions of improvement at the University/College setting, which is typically considered a traditional setting for AT students. This finding could also be attributed to the fact that often times University/College settings have a larger staff as compared to a High School setting, which may allow the staff the schedule flexibility to mentor students on these Core Competencies, which often times have components that occur outside of the actual patient interaction. Quality improvement is the cyclical process in which areas in need of improvement are identified, an intervention is implemented, and outcomes are assessed to determine intervention effectiveness. This Core Competency often necessitates the use of Healthcare Informatics in its process. Electronic Medical Records (EMRs) and Patient Reported Outcomes (PROs) are two ways to implement Quality Improvement and the Use of Healthcare Informatics. It has been reported that about half Athletic Trainers at the secondary school level have a budget of less than \$4000.<sup>24</sup> EMR systems may not be feasibly acquired by secondary schools in that case, thus limiting the implementation of Quality Improvement at that level. Additionally, in secondary schools

there is likely to be a high patient to practitioner ratio,<sup>24</sup> and time has been cited as a barrier to athletic trainers using PROs in clinical practice.<sup>25</sup> The lower number of athletic trainers treating a larger population in high schools with athletic trainers results in decreased time availability per patient, and is likely a contributing factor why Quality Improvement and Use of Healthcare Informatics is less likely to be implemented at the High School setting, and therefore students at these sites are not exposed to them during their interactions there. It is important that AT program personnel ensure that the Core Competencies are being implemented by the preceptors at all clinical education sites in order to ensure student exposure and competence in these areas.

*Frequency, Length, Modal Role, and Clinical Site Type*

In examining all of the independent variables together, we hypothesized that the student role and frequency of patient encounters would predict the largest amount of variance in perceived improvement in the Core Competencies. This hypothesis was based on the previous assertion that students perceive better clinical experiences based on the level of engagement during those experiences.<sup>3,23</sup> However, our findings did not support this hypothesis, indicating that none of the independent variables, when examined in one model, explain a significant amount of variance in the perception of Core Competency improvement. This finding may indicate a need to examine these variables on a larger participant population as well as over a longer period of time to better assess changes in perceived improvement. Additionally, it is possible that perception of improvement is more dependent on intrinsic factors, such as confidence, than on quantitative extrinsic factors. More research is needed in this area to determine how perception of improvement is impacted by experiences within clinical education.

### Limitations and Suggestions for Future Research

The limitations of this pilot study are that it was only conducted with one institution over the course of one clinical education rotation, and that the students were relied upon to honestly report patient encounters and perceptions of improvement. Although a baseline level of information on the Core Competencies was provided to the students, knowledge and understanding of the Core Competencies were not evaluated or demonstrated. Future research should focus on examining multiple institutions, potentially over a longitudinal range of students' entire clinical education phase. Additionally, future research may need to include student personal characteristics, such as confidence and personality, when examining perception of improvement in Core Competencies.

### Conclusions

The findings of this study should be considered by program personnel when determining clinical education experiences for students, ideally selecting placements that allow students a higher level of engagement in the role that the student will be able to fulfill during the majority of encounters. Student engagement in the role during patient encounters may also need to be considered during preceptor training and education to allow Preceptors to understand the importance of the educators' role in student attainment of an improved perception of competence.

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**Table VI.A.1: Survey reliability (Cronbach's Alpha)**

	Perceived improvement over the course of the semester
Quality Improvement (12 items)	0.702
Professionalism (18 items)	0.949
Use of Health Care Informatics (9 items)	0.929
Interprofessional Education and Collaborative Practice (8 items)	0.862
Evidence-Based Practice (13 items)	0.936
Patient Centered Care (11 items)	0.948

**Table VI.A.2: Core Competency question block**

- 
1. Were you able to implement the patient-centered care competency during this patient encounter? (yes/no)
  2. Were you able to implement the inter-professional collaboration competency during this patient encounter? (yes/no)
  3. Were you able to implement the evidence-based practice competency during this patient encounter? (yes/no)
  4. Were you able to implement the quality improvement competency during this patient encounter? (yes/no)
  5. Were you able to implement the informatics competency during this patient encounter? (yes/no)
  6. Were you able to implement the professionalism competency during this patient encounter? (yes/no)
-

**Table VI.A.3: Survey scale score test for normal distribution (Shapiro-Wilk).**

	Perceived Change over the course of the semester
Quality Improvement (12 items)	0.95, $p = 0.13$
Professionalism (18 items)	0.95, $p = 0.21$
Use of Health Care Informatics (9 items)	0.98, $p = 0.80$
Interprofessional Education and Collaborative Practice (8 items)	0.99, $p = 0.94$
Evidence-Based Practice (13 items)	0.98, $p = 0.64$
Patient Centered Care (11 items)	0.97, $p = 0.54$

**Table VI.A.4: Perceived improvement in competency level scale score by Cohort (M  $\pm$  SD).**

	First Year Students	Second Year Students	Third Year Students
Quality Improvement	3.14 $\pm$ 0.47	2.56 $\pm$ 0.51	2.62 $\pm$ 0.80
Professionalism	3.10 $\pm$ .060	2.57 $\pm$ 0.61	2.47 $\pm$ 0.77
Use of Healthcare Informatics	2.90 $\pm$ 0.62	2.32 $\pm$ 0.62	2.33 $\pm$ 0.79
Interprofessional Education and Collaborative Practice	3.03 $\pm$ 0.48	2.28 $\pm$ 0.48	2.18 $\pm$ 0.74
Evidence-Based Practice	3.17 $\pm$ 0.50	2.58 $\pm$ 0.54	2.51 $\pm$ 0.80
Patient Centered Care	3.19 $\pm$ 0.47	2.64 $\pm$ 0.70	2.45 $\pm$ 0.87

**Table VI.A.5: Descriptive data for Core Competency implementation per patient encounter.**

Dependent Variable	Description	Variables	Number	%	Mean	SD
Sum of Core Competency Implementation	Per a patient encounter, (range 0-6)	Total	2744	100	4.04	1.37
		0	9	0.3		
		1	228	8.3		
		2	51	1.9		
		3	554	20.2		
		4	771	28.1		
		5	788	28.7		
Ability to Implement the Patient-Centered Care Competency	Per a patient encounter, (No = 0, Yes =1)	No	251	9.1	0.91	0.29
		Yes	2493	90.9		
Ability to Implement the Interprofessional Education and Collaborative Practice Competency	Per a patient encounter, (No = 0, Yes =1)	No	1986	72.4	0.28	0.45
		Yes	758	27.6		
Ability to Implement the Evidence-based Practice Competency	Per a patient encounter, (No = 0, Yes =1)	No	1099	40.1	0.6	0.49
		Yes	1645	59.9		
Ability to Implement the Quality Improvement Competency	Per a patient encounter, (No = 0, Yes =1)	No	553	20.2	0.8	0.4
		Yes	2191	79.8		
Ability to Implement the Use of Healthcare Informatics Competency	Per a patient encounter, (No = 0, Yes =1)	No	1470	53.6	0.46	0.5
		Yes	1274	46.4		

Ability to Implement the Professionalism Competency	Per a patient encounter, (No = 0, Yes =1)	No	29	1.1	0.99	0.1
		Yes	2715	98.9		

**Table VI.A.6: Descriptive data for patient encounter frequency and length per student**

Independent Variable	Description	Range	Mean	SD
Patient Encounter Frequency	Number of patient encounters each student had during semester	2-240	74.2	59.3
Patient Encounter Length	Length of time patient encounters lasted (Minutes)	0-420	19.29	23



**Table VI.A.7: Descriptive data for role and site per patient encounter.**

	Number	Percentage
<b>Student Role</b>		
Observed	865	3.15
Assisted	601	21.9
Performed	781	28.5
Other	474	17.3
<b>Clinical Site Assignment</b>		
University	1927	70.2
High School	806	29.4
Clinic/Other	11	0.4

**Table VI.A.8: Student demographic data**

	First Year	Second Year	Third Year	Overall
Participants (n)	11	12	10	33
Gender				
Male (n)	3	3	2	8
Female (n)	8	9	8	25
Age	19.36 ± 1.57	20.58 ± 1.62	21.20 ± 0.42	20.36 ± 1.52
Setting				
University	9	8	7	24
High School	2	4	3	9

## **CHAPTER VII**

### **Conclusions**

The overall purpose of this dissertation was to gain a better understanding of the process by which Professional education of an athletic trainer is delivered and evaluated. Prior to these projects, the existing literature was thoroughly searched to determine existing knowledge regarding educational practices and clinical education outcome measurements in athletic training education. Subsequently, the following purposes were formulated to contribute to the existing literature. The purpose of the qualitative content analysis was to determine if accreditation standard content reflects the goals and mission of the athletic training accrediting body of the time, the period of time in which the Standard were in place, and the overall direction of education during the time in which each set of Standards were utilized. The purpose for Project I was to collect descriptive data for professional athletic training program in order to demonstrate potential benefits and consequences of the proposed degree change, and to compare baccalaureate and post-baccalaureate professional programs with regard to performance in universal outcome measures. The purpose of Project II was to explore the perceptions and experiences of Clinical Education Coordinators as they assign students in clinical education placements within the confines of the accreditation Standards. The purpose of Project IIIA was to determine to what extent implementation of the Core Competencies, as a whole and individually, are related to the frequency of patient encounters, the length of patient encounters, the role of the student during patient encounters, and the clinical site assignment of the student during patient encounters. The purpose of Project IIIB was to determine to what extent the students' perceived level of improvement in each of the

individual Core Competencies was related to the frequency of patient encounters, the length of patient encounters, the role of the student during patient encounters, and the clinical site assignment of the student during patient encounters. To summarize the findings, the following hypotheses have been revisited:

Hypothesis for Aim 1A: The goals and respective mission of the accrediting agency will be apparent within their associated set of Standards.

*Findings:* The hypothesis was confirmed that the accreditation Standards reflect the goals and missions of the accrediting agency.

Hypothesis for Aim 1B: The accreditation Standards will reflect the historical time period in which they were in use.

*Findings:* The hypothesis was validated in that the documented historical happenings of the profession are reflected in the types of Standards for each period.

Hypothesis for Aim 1C: The overall direction and focus of education will be evident within the set of accreditation Standards in use for each time period.

*Findings:* The hypothesis was verified with the direction and focus of education evident in the types of Standard in existence for each time period.

Hypothesis for Aim 2A: The descriptive data for professional education programs will confirm some the potential benefits and consequences of a degree transition.

*Findings:* The hypothesis was for the most part substantiated as the existing published concerns regarding potential loss of faculty positions and AT programs was corroborated by our findings however, many of the potential benefits, such as

increased salary and respect amongst peer professions could not be determined by the data collected.

Hypothesis for Aim 2B: Post-baccalaureate professional athletic training programs will perform better in the existing universal outcome measures.

*Findings:* The hypothesis was confirmed as post-baccalaureate athletic training programs had higher first time BOC pass rates, higher overall BOC pass rates, and higher rates of placement of graduates within the AT profession.

Hypothesis for Aim 3: Clinical Education Coordinators will report placing student in clinical education experiences based on the accreditation standard the primary placement consideration.

*Findings:* The hypothesis was validated as CECs identified the Standard as one the primary influences to their selection process of clinical education experiences for students.

Hypothesis for Aim 4A: An increased frequency of patient encounters will result in increased Core Competency implementation by athletic training students.

*Findings:* The hypothesis was verified as Core Competency was significantly related to increased patient encounter frequency.

Hypothesis for Aim 4B: Patient encounters that result in a greater amount of time spent with the patient will result in increased Core Competency implementation by athletic training students.

*Findings:* The null hypothesis was supported with the finding that as average patient encounter length increased the total number of Core Competencies implemented decreased.

Hypothesis for Aim 4C: Students who are able to assume a role with greater autonomy will have increased Core Competency implementation.

*Findings:* The hypothesis was in part substantiated in that those students who Assisted in patient encounters were more likely to implement some Core Competencies than those who Observed or selected the role of Other during patient encounters. The relationship was not consistent for those who Performed encounters as compared with those that Assisted.

Hypothesis for Aim 4D: Students at different Clinical Education sites will have increased opportunities to implement Core Competencies.

*Findings:* The hypothesis was validated as students within University/College settings were more likely to implement Core Competencies as compared to those who selected Other, and the same students were more likely to implement some of the Core Competencies as compared to those at High School settings.

Hypothesis for Aim 5A: An increased frequency of patient encounters will result in greater perceived level of improvement in Core Competencies by athletic training students.

*Findings:* The null hypothesis was verified as increased frequency of patient encounters did not result in significant differences in perceived level of improvement in Core Competencies.

Hypothesis for Aim 5B: Patient encounters that result in a greater amount of time spent with the patient will result in greater perceived level of improvement in the Core Competencies.

*Findings:* The null hypothesis was supported with the finding that average patient encounter length was not significantly related to perceived level of improvement in the Core Competencies.

Hypothesis for Aim 5C: Students who are able to assume a role with greater autonomy will have a greater perceived level of improvement in the Core Competencies.

*Findings:* The hypothesis was in part substantiated in that those students who Performed patient encounters perceived greater levels of improvement than those who Observed or selected the role of Other during patient encounters. The relationship was not significantly different for those who Performed encounters as compared with those that Assisted.

Hypothesis for Aim 5D: Students at different Clinical Education sites will have a greater perceived improvement in the Core Competencies.

*Findings:* The hypothesis was in part validated as students within University/College settings perceived greater levels of improvement in Quality Improvement, Use of Healthcare Informatics, and Professionalism as compared to those at High School settings or those who selected Other settings.

### **Summary and Clinical Application**

The professional preparation of athletic training students will continue to evolve as the needs of the profession change. Specifically, the discussion regarding the appropriate professional degree is ongoing and has not yet resulted in a determination. Project I resulted in the confirmation of some existing editorial concerns regarding the impact of a potential transition to the requirement of an entry level post-baccalaureate

degree for athletic trainers. There is the potential for some existing AT programs to be unable to offer post-baccalaureate degrees in their existing structure within their respective Institutions. Additionally, a degree transition could result in the loss of some faculty and graduate assistant positions. Conversely, this could result in the increased need for qualified faculty and staff personnel that have the potential improve patient care. Additionally, post-baccalaureate AT programs perform better in universal outcome measures than their undergraduate counterparts. Thus, the consideration of the degree should focus on the best interests of the profession, and should not be delayed based on concerns that may only impact a few Institutions or programs.

The findings of Project I highlighted the lack of existing universal outcomes relative to clinical education, as current outcome measures are primarily didactic in nature. To examine clinical education one must first understand the types of clinical education experiences that AT students are being exposed to, hence Project II. In Project II the experiences and methods of Clinical Education Coordinators in selecting clinical education experiences for their students were qualitatively examined. It was determined from this examination that the accreditation Standards do influence clinical education placements as a priority, but that additional outside influences do contribute to the method by which such experiences are selected. Outside of the Standards, CECs are most apt to consider the best interests of the student and the availability of clinical sites. CECs also allow students to make requests, but such requests should be considered only in the best interest of the students' preparation for clinical practice, and preceptor requests are often not considered. Lastly, the barriers to clinical education placements are related to the location and structure of the program, and the number of sites or



students. Suggestions to be addressed in future Standards include removing some of the specificity of the sites and focusing on the goal of the experience, which should be to prepare the student for professional practice. CECs will continue to be required to fulfill the accreditation Standards, but should consider these findings when determining other influences to the methods by which they select clinical education experiences for their students.

In examining how clinical education is determined for students, it once again highlighted the lack of outcome measure for summative assessment of clinical education in athletic training. Additionally, the Institute of Medicine has recommended the incorporation of Core Competencies into the educational preparation of all healthcare providers, which has not yet been done in the professional preparation of athletic trainers. Thus, Project IIIA and IIIB evaluated the implementation of, and perception of level of improvement in, the Core Competencies relative to patient encounters. Core Competency implementation is most primarily related to the frequency of patient encounters and therefore AT program personnel should be tracking patient encounters by their students, and should be selecting and utilizing clinical education experiences that allow the student the greatest opportunity to implement the Core Competencies. As the length of patient encounter increased, students were able to implement fewer Core Competencies, so this variable should also be considered when determining clinical education placements.

The student role of Assisted resulted in greater Core Competency implementation than those that Observed, and in some of the Core Competency areas greater implementation than those that Performed. The perceived level of improvement for

students was also greater for some of the Core Competency areas for those students who Assisted. This finding highlights the importance of the preceptor in facilitating the engagement process during patient encounters. Students who are practicing independently, although under supervision, and those who may only be watching their preceptor clinically practice are not having the opportunity to implement the Core Competencies, nor do they perceive that they are improving within those Core Competency areas.

The clinical site at which encounters occurred may also have had some influence on the implementation of Core Competencies, and it was correlated to the perceived level of improvement. Students whose encounters primarily occurred at the University/College level perceived greater improvement in three of the Core Competency areas when compared to the High School Setting. These areas; Professionalism, Quality Improvement, and Use of Healthcare Informatics, are typically associated with the use of Electronic Medical Records and Patient Reported outcomes. These tools may be more difficult to employ at the High School level, and this finding highlights the need for additional support to be provided to preceptors at this level to encourage the implementation of these tools to provide improved patient care as well as improved clinical education experiences for AT students.

It is evident from these studies that an evaluation of the clinical education component of athletic training could benefit the overall preparation of athletic trainers. The findings of projects IIIA and IIIB highlight the importance of student experiences with a higher patient volume under the supervision of an engaging preceptor. Yet, based off of the findings of Project II, patient volume was not considered in the selection

process for clinical education experiences, and the preceptor can only be considered after the requirements of the Standard have been fulfilled. The impact to clinical education has also not been mentioned as a concern or benefit to degree transition as this was examined in Project I. Overall, this dissertation highlights the importance of clinical education in the professional preparation of athletic trainers, as well as the importance of a summative clinical education assessment to determine the benefits of the experience that students are receiving relative to their preparation as healthcare provider.

## **APPENDICES**

### **Appendix A: Post-Experience Core Competency Survey**

#### **EDUCATIONAL CORE COMPETENCIES WITHIN PROFESSIONAL ATHLETIC TRAINING**

The purpose of this study is to determine your perception of your current abilities and perceived improvement within the core competencies that may be part of the next edition of the CAATE standards for Professional degree programs. The six educational core competencies consist of the following:

1. Quality improvement
2. Professionalism
3. Healthcare informatics
4. Interdisciplinary collaboration
5. Evidence-based practice
6. Patient-centered care

Within this survey, you will be asked to rate your perceptions of each competency as it relates to your clinical practice, as well as to rate your perceived level of improvement for each competency over the course of your clinical experience.

This research study has been approved by the Human Subjects Committee of the College of Education at Old Dominion University. The survey will take you approximately 10-15 minutes to complete. Please read all questions and answer them to the best of your ability.

All information that you provide will be kept confidential and will not be linked back to you in any way. Upon completion of the survey, please return the document to the faculty member that distributed it to you.

Thank you in advance for your participation!

## Competency: Quality Improvement

**Definition:** Healthcare organizations are increasingly adopting quality assessment methods that originated in the industrial manufacturing sector to minimize waste, decrease errors, increase efficiency, and improve quality of care.

Competency in quality improvement relates to the athletic trainer's recognition of the need for constant self-evaluation and life-long learning, and it includes the ability to identify a quality improvement objective, specify changes that are expected to produce an improvement, and quantitatively confirm that an improvement resulted from implementation of the change (e.g., improved patient outcomes from administration of a specific intervention or utilization of a specific protocol).

*How do you perceive your current athletic training abilities as they relate to the various concepts identified within the Quality Improvement competency? Also, how do you perceive your improvement within this competency since the start of this experience?*

	Perceived Current Ability					Perceived Improvement			
<b>QUALITY IMPROVEMENT COMPETENCY</b>	1 Strongly Disagree	2 Disagree	3 Agree	4 Strongly Agree		1 No Improvement	2 Minimal Improvement	3 Moderate Improvement	4 Significant Improvement
You provide customer and client focused care to ensure that each person associated with the care is engaged in the process									
You promote effective communication with all of a patient's health care providers to ensure that the patient gets the care and support he/she needs and wants									
You promote effective coordination of care with all of the patient's health care providers to ensure that the patient gets the care and support he/she needs and wants									

You provide care that is in the best interest of the patient and avoid injuries to patients from the care that is intended to help them									
You promote prevention approaches to care rather than to only provide correction following incidents									
You provide patient centered care that is respectful of, and responsive to, an individual patient's preferences, needs, and values to ensure that the patient's values guide all clinical decisions									
	Perceived Current Ability					Perceived Improvement			
<b>QUALITY IMPROVEMENT COMPETENCY</b>	1 Strongly Disagree	2 Disagree	3 Agree	4 Strongly Agree		1 No Improvement	2 Minimal Improvement	3 Moderate Improvement	4 Significant Improvement
You manage care by initially determining what the problem is and identifying the facts about the problem									
You focus on the use of data to analyze processes, identify problems, and measure performance									
You understand athletic training care as a system and process that provides concise compilation of information that will be of value to other organizations, including reference databases									

You are able to identify defects in quality of care and trace them to the source to avoid similar problems in the future (i.e., continuous improvement)									
You are able to empower the healthcare workforce around you in order to help co-workers embrace ownership									
You are able to assist with the creation of an environment that is committed to quality, teamwork, and accountability									

### Competency: Professionalism

**Definition:** Professionalism relates to personal qualities of honesty, reliability, accountability, patience, modesty, and self-control. It is exhibited through ethical behavior, a respectful demeanor toward all persons, compassion, a willingness to serve others, sensitivity to the concerns of diverse patient populations, a conscientious approach to performance of duties, a commitment to continuing education, contributions to the body of knowledge in the discipline, appropriate dress, and maintenance of a healthy lifestyle.

Competency in professionalism relates to the athletic trainer's adherence to the NATA *Code of Ethics* and the Board of Certification *Standards of Practice*, and includes intrinsic motivation to continuously exhibit the manifestations of professionalism in all aspects of clinical practice and personal conduct.

*How do you perceive your current athletic training abilities as they relate to the various concepts identified within the Professionalism competency? Also, how do you perceive your improvement within this competency since the start of this experience?*

	Perceived Current Ability					Perceived Improvement			
<b>PROFESSIONALISM COMPETENCY</b>	1 Strongly Disagree	2 Disagree	3 Agree	4 Strongly Agree		1 No Improvement	2 Minimal Improvement	3 Moderate Improvement	4 Significant Improvement
You are able to recognize when there is a conflict of interest between yourself, your patients, and your clinical practice									
You are able to resolve conflicts between your interests and the patients' interests									
You are able to consistently place the interest of the individual patient and society above your own									
You exercise accountability for yourself and for your colleagues in providing patient care and considering the financial impact of your decisions									
You adhere to high ethical and moral standards									
You are able to protect consumers against unprofessional, incompetent, or unethical conduct concerning other healthcare professionals									
You respect other healthcare professionals that you work with and recognize their unique skills and abilities									



	Perceived Current Ability					Perceived Improvement			
<b>PROFESSIONALISM COMPETENCY</b>	1 Strongly Disagree	2 Disagree	3 Agree	4 Strongly Agree		1 No Improvement	2 Minimal Improvement	3 Moderate Improvement	4 Significant Improvement
<b>You demonstrate a continuing commitment to excellence through the dissemination of new knowledge in athletic training to fellow athletic trainers, patients, and other healthcare professionals</b>									
<b>You maintain competence in the body of knowledge you are responsible for and you have a commitment to lifelong learning, which will enhance your clinical practice</b>									
<b>You practice in a legally competent manner by conforming to the laws that govern athletic training within your state and you understand the consequences of violating these laws</b>									
<b>You practice a healthy lifestyle in which you maintain an equal work-life balance ratio while being cognizant of internal and external stressors</b>									
<b>You demonstrate sensitivity to multiple cultures through your awareness of the impact of patients' cultural differences on their attitudes and behaviors toward healthcare</b>									
<b>You demonstrate the knowledge, attitudes, beliefs and skills necessary to achieve optimal health outcomes for diverse patient populations</b>									

<b>You know and apply the commonly accepted standards for patient confidentiality</b>									
<b>You demonstrate effective interpersonal communication skills</b>									
<b>You understand the scope of practice of other healthcare professionals that you work with</b>									
<b>You reflect critically upon your actions and decisions and strives for improvement in all aspects of your work</b>									
<b>You receive and respond well to critiques from peers, colleagues, and superiors</b>									

### Competency: Use of Healthcare Informatics

**Definition:** Clinicians must increasingly use information technology to manage clinical data and access the most recent evidence pertaining to optimum patient care.

Competency in the use of healthcare informatics relates to the athletic trainer's ability to: 1) search, retrieve, and utilize information derived from online databases and/or internal databases for clinical decision support, 2) properly protect the security of personal health information in a manner that is consistent with legal and ethical considerations for use of such data, including control of data access, utilization of patient identity coding, de-identification of aggregated data, and encryption of electronically transmitted data, 3) guide patients to online sources of reliable health-related information, 4) utilize word processing, presentation, and data analysis software, and 5) communicate through email, text messaging, listservs, and emerging modes of interactive electronic information transfer.

*How do you perceive your current athletic training abilities as they relate to the various concepts identified within the Healthcare Informatics competency? Also, how do you perceive your improvement within this competency since the start of this experience?*

	Perceived Current Ability					Perceived Improvement			
<b>HEALTHCARE INFORMATICS COMPETENCY</b>	1 Strongly Disagree	2 Disagree	3 Agree	4 Strongly Agree		1 No Improvement	2 Minimal Improvement	3 Moderate Improvement	4 Significant Improvement
You understand the terminology used in informatics (informatics, medical informatics, health informatics, consumer health informatics, clinical health informatics, computer literacy, information literacy, medical terminology)									
You understand the continuum for informatics use which entails the management of data, specific to a certain context, and moves towards a greater understanding of relations, patterns, and principles, ending with wisdom									

<b>You understand the role and differences between the Electronic Health Records (EHR) and Electronic Medical Records (EMR) within the context of the stakeholders (providers, patients, payers)</b>									
<b>You use computerized patient records to develop clinical questions and support your plan of care</b>									
<b>You have the ability to process, interpret and understand data which is collected to support patient care and decision making</b>									
	<b>Perceived Current Ability</b>					<b>Perceived Improvement</b>			
<b>HEALTHCARE INFORMATICS COMPETENCY</b>	<b>1 Strongly Disagree</b>	<b>2 Disagree</b>	<b>3 Agree</b>	<b>4 Strongly Agree</b>		<b>1 No Improvement</b>	<b>2 Minimal Improvement</b>	<b>3 Moderate Improvement</b>	<b>4 Significant Improvement</b>
<b>You use standardized clinical terminology that facilitates communication and sharing of information across providers and across professions</b>									
<b>You follow security and confidentiality precautions in order to protect patient privacy</b>									
<b>You use informatics within clinical practice as a teaching/learning mechanism</b>									
<b>You are an active participant in the decisions concerning utilization and development of our clinical information system within the clinical practice setting</b>									

**Competency: Interdisciplinary Collaboration**

**Definition:** Cooperation among clinicians who provide care for a patient is far more important than professional prerogatives and roles. Different health professions often perform a subset of overlapping functions, but separate scopes of practice, governance structures, and standards maintained by licensing agencies for the different health professions present obstacles to the delivery of optimum patient care by an interdisciplinary team.

Competency in interdisciplinary collaboration relates to the athletic trainer's ability to interact with other health professionals in a manner that optimizes the quality of care provided to individual patients.

*How do you perceive your current athletic training abilities as they relate to the various concepts identified within the Interdisciplinary Collaboration competency? Also, how do you perceive your improvement within this competency since the start of this experience?*

	Perceived Current Ability					Perceived Improvement			
<b>INTERDISCIPLINARY COLLABORATION COMPETENCY</b>	1 Strongly Disagree	2 Disagree	3 Agree	4 Strongly Agree		1 No Improvement	2 Minimal Improvement	3 Moderate Improvement	4 Significant Improvement
You interact with other health professionals to optimize the quality of care provided to individual patients									
You appreciate and understand the scope of practice of the disciplines and professionals you interact with									
You participate within a health care team consisting of individuals with diverse training and backgrounds that supplement care									

<b>You are able to resolve conflicts with your interdisciplinary health care team if there are a diverse set of views</b>									
<b>You work within a true collaborative practice that has no hierarchy</b>									
<b>You work within a clinical practice setting in which mutual respect is fostered among the disciplines</b>									
<b>You have planned opportunities to collaborate and interact with other health care students, which enable you to learn new skills and approaches for patient care</b>									
<b>You have planned opportunities with other healthcare professionals that benefit your clinical practice growth</b>									

**Competency: Evidence-Based Practice**

**Definition:** Evidence-based practice (EBP) is the integration of best research evidence with clinical expertise and patient values to make decisions about the care of individual patients. Competency in evidence-based practice relates to the athletic trainer's ability to integrate the best available research evidence with clinical expertise and consideration of patient values and circumstances to optimize patient outcomes.

*How do you perceive your current athletic training abilities as they relate to the various concepts identified within the Evidence-Based Practice competency? Also, how do you perceive your improvement within this competency since the start of this experience?*

<b>EVIDENCE-BASED PRACTICE COMPETENCY</b>	<b>Perceived Current Ability</b>				<b>Perceived Improvement</b>			
	1 Strongly Disagree	2 Disagree	3 Agree	4 Strongly Agree	1 No Improvement	2 Minimal Improvement	3 Moderate Improvement	4 Significant Improvement
You have adopted an EBP approach to your clinical practice								
You utilize Electronic Medical Record (EMR) information to make clinical decisions								
You believe that literature and research findings are useful in your day-to-day clinical practice								
You take your clinical setting into account when making clinical decisions								
You take patient preferences and values into account when making clinical decisions								
You take your clinical expertise and experience into account when making clinical decisions								
You critically evaluates the outcome of your interventions								
You possess a curiosity and a sense of inquiry that defines you as a life-long learner								

<b>You recognize and understand the limits of science, your knowledge and your skills, when making a clinical decision</b>									
<b>You engage in continuous quality improvement within your own practice</b>									
<b>You are knowledgeable concerning the mechanisms to access evidence through institutional databases</b>									
<b>You have the ability to critically appraise evidence in an accurate manner</b>									
<b>You understand the role injury and illness can play in the disablement of a patient</b>									



## Competency: Patient-Centered Care

**Definition:** Patient-centered care is characterized by efforts to clearly inform, educate, and communicate with patients in a compassionate manner. Shared decision-making and management are emphasized, as well as continuous advocacy of injury and disease prevention measures and promotion of a healthy lifestyle.

Competency in patient-centered care relates to the athletic trainer's ability to serve as an advocate for a patient's best interests, to educate the patient about health-related concerns and intervention options, to recognize any conflict of interest that could adversely affect the patient's health, and to facilitate collaboration among the patient, physician, family, and other members of the patient's social network or healthcare system in order to develop an effective treatment plan that includes agreed-upon implementation steps, short-term goals and long-term goals.

*How do you perceive your current athletic training abilities as they relate to the various concepts identified within the Patient-Centered Care competency? Also, how do you perceive your improvement within this competency since the start of this experience?*

<b>PATIENT-CENTERED CARE COMPETENCY</b>	<b>Perceived Current Ability</b>				<b>Perceived Improvement</b>			
	1 Strongly Disagree	2 Disagree	3 Agree	4 Strongly Agree	1 No Improvement	2 Minimal Improvement	3 Moderate Improvement	4 Significant Improvement
You promote a patient-centered healthcare system that gives patients the ability to communicate effectively and immediately with their providers								
You look holistically at an individual and treat them through the coordination of other providers through shared decision making								
You utilize information from patient surveys to assess the quality of care that you provide								
You provide information to your patients that is important and useful for them								

<b>You provide your patients with access to real-time electronic information</b>									
<b>You utilize patient-report outcomes within your clinical practice</b>									
<b>You provide patient education to self-manage care following discharge</b>									
<b>You respond quickly, effectively and safely to patients' needs and wishes</b>									
<b>You provide patients with a continuity of care which smoothly transitions across service boundaries</b>									
<b>You treat your patients and their families in a dignified and supportive manner</b>									
	<b>Perceived Current Ability</b>					<b>Perceived Improvement</b>			
<b><i>PATIENT-CENTERED CARE COMPETENCY</i></b>	<b>1 Strongly Disagree</b>	<b>2 Disagree</b>	<b>3 Agree</b>	<b>4 Strongly Agree</b>		<b>1 No Improvement</b>	<b>2 Minimal Improvement</b>	<b>3 Moderate Improvement</b>	<b>4 Significant Improvement</b>
<b>You provide your patients and families with evidence-based, cost effective quality care that maximizes health, alleviates discomfort and is safe and free from avoidable errors</b>									

**DEMOGRAPHICS** – Please answer the following demographic questions about you to the best of your ability.

**1. Your Age:** \_\_\_\_\_

**2. Your Gender:** \_\_\_\_\_ M \_\_\_\_\_ F

**3. Your expected graduation year from your professional program:** \_\_\_\_\_

**4. What is your year in school? (circle one):** Freshman Sophomore Junior Senior

**5. In which clinical setting did you conduct a majority of your patient care:**

\_\_\_\_\_ Collegiate/University \_\_\_\_\_ High School \_\_\_\_\_ Clinic \_\_\_\_\_ Military \_\_\_\_\_ Performing Arts \_\_\_\_\_ Industrial

\_\_\_\_\_ Other: \_\_\_\_\_

**6. If a sport is associated with your clinical assignment, which sport did you gain clinical experience within?**

\_\_\_\_\_

**7. Did you utilize an EMR (Electronic Medical Record system or any other form of electronic documentation at your clinical site)?**

\_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_

**7a. If yes, did you use this EMR system for more than just documentation and record keeping such as tracking injury trends?**

\_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Unknown

**8. Patient reported outcomes (PROs) are questionnaires used in a clinical setting that are given to the patient in order to gain the patient's perspective on the status of their injury. Does you utilize any patient reported outcomes (PROs) at your clinical site (ex. SF-36, IKDC, FAAM)?** \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Unknown

**9. Did you refer patients to outside providers such as physical therapists, chiropractors, etc?** \_\_\_\_\_ Yes \_\_\_\_\_ No

**10. Do you work with variety of health care professionals (i.e. Orthopedic surgeons, nurses, general practitioners, dentists...)?**

\_\_\_\_\_ Yes \_\_\_\_\_ No

**This is the conclusion of the survey. Please be sure to double check that all questions have been answered.**  
**Thank you for your participation!**

## Appendix B: ANOVA output by Student Cohort

### Patient-Centered Care

#### Tests of Between-Subjects Effects

Dependent Variable: ScalePCCPerceived

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	3.240 <sup>a</sup>	2	1.620	3.382	.048	.189
Intercept	242.469	1	242.469	506.179	.000	.946
SchoolYearGroup	3.240	2	1.620	3.382	.048	.189
Error	13.892	29	.479			
Total	261.851	32				
Corrected Total	17.131	31				

a. R Squared = .189 (Adjusted R Squared = .133)

#### Pairwise Comparisons

Dependent Variable: ScalePCCPerceived

(I) Year within the Program	(J) Year within the Program	Mean Difference (I-J)	Std. Error	Sig. <sup>a</sup>	95% Confidence Interval for Difference <sup>a</sup>	
					Lower Bound	Upper Bound
First year students	Second year students	.550	.295	.217	-.200	1.300
	Third year students	.754	.302	.056	-.015	1.522

Second year students	First year students	-.550	.295	.217	-1.300	.200
	Third year students	.204	.302	1.000	-.565	.972
Third year students	First year students	-.754	.302	.056	-1.522	.015
	Second year students	-.204	.302	1.000	-.972	.565

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

*Interprofessional Education and Collaboration*

#### Tests of Between-Subjects Effects

Dependent Variable: ScaleICPerceived

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	4.768 <sup>a</sup>	2	2.384	7.350	.003	.329
Intercept	204.583	1	204.583	630.665	.000	.955
SchoolYearGroup	4.768	2	2.384	7.350	.003	.329
Error	9.732	30	.324			
Total	220.750	33				
Corrected Total	14.500	32				

a. R Squared = .329 (Adjusted R Squared = .284)

#### Pairwise Comparisons

Dependent Variable: ScaleICPerceived

(I) Year within the Program	(J) Year within the Program	Mean Difference (I-J)	Std. Error	Sig. <sup>b</sup>	95% Confidence Interval for Difference <sup>b</sup>	
					Lower Bound	Upper Bound
First year students	Second year students	.753*	.238	.011	.150	1.356
	Third year students	.859*	.249	.005	.228	1.490
Second year students	First year students	-.753*	.238	.011	-1.356	-.150
	Third year students	.106	.244	1.000	-.512	.725
Third year students	First year students	-.859*	.249	.005	-1.490	-.228
	Second year students	-.106	.244	1.000	-.725	.512

Based on estimated marginal means

\*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

*Evidence-Based Practice*

#### Tests of Between-Subjects Effects

Dependent Variable: ScaleEBPPerceived

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2.867 <sup>a</sup>	2	1.433	3.763	.035	.201
Intercept	248.331	1	248.331	652.001	.000	.956
SchoolYearGroup	2.867	2	1.433	3.763	.035	.201
Error	11.426	30	.381			
Total	264.385	33				
Corrected Total	14.293	32				

a. R Squared = .201 (Adjusted R Squared = .147)

### Pairwise Comparisons

Dependent Variable: ScaleEBPPerceived

(I) Year within the Program	(J) Year within the Program	Mean Difference (I-J)	Std. Error	Sig. <sup>a</sup>	95% Confidence Interval for Difference <sup>a</sup>	
					Lower Bound	Upper Bound
First year students	Second year students	.591	.258	.087	-.062	1.244
	Third year students	.660	.270	.061	-.024	1.344
Second year students	First year students	-.591	.258	.087	-1.244	.062
	Third year students	.069	.264	1.000	-.601	.739
Third year students	First year students	-.660	.270	.061	-1.344	.024
	Second year students	-.069	.264	1.000	-.739	.601

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

### Use of Health Care Informatics

### Tests of Between-Subjects Effects

Dependent Variable: ScaleHIPerceived

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2.405 <sup>a</sup>	2	1.202	2.652	.087	.150
Intercept	207.977	1	207.977	458.731	.000	.939
SchoolYearGroup	2.405	2	1.202	2.652	.087	.150



Error	13.601	30	.453
Total	225.113	33	
Corrected Total	16.006	32	

a. R Squared = .150 (Adjusted R Squared = .094)

#### Pairwise Comparisons

Dependent Variable: ScaleHIPerceived

(I) Year within the Program	(J) Year within the Program	Mean Difference (I-J)	Std. Error	Sig. <sup>a</sup>	95% Confidence Interval for Difference <sup>a</sup>	
					Lower Bound	Upper Bound
First year students	Second year students	.575	.281	.149	-.138	1.288
	Third year students	.570	.294	.187	-.176	1.316
Second year students	First year students	-.575	.281	.149	-1.288	.138
	Third year students	-.005	.288	1.000	-.736	.726
Third year students	First year students	-.570	.294	.187	-1.316	.176
	Second year students	.005	.288	1.000	-.726	.736

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

#### Quality Improvement

#### Tests of Between-Subjects Effects

Dependent Variable: ScaleQIPerceived

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
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Corrected Model	2.263 <sup>a</sup>	2	1.132	3.138	.058	.173
Intercept	251.721	1	251.721	698.142	.000	.959
SchoolYearGroup	2.263	2	1.132	3.138	.058	.173
Error	10.817	30	.361			
Total	265.861	33				
Corrected Total	13.080	32				

a. R Squared = .173 (Adjusted R Squared = .118)

#### Pairwise Comparisons

Dependent Variable: ScaleQIPerceived

(I) Year within the Program	(J) Year within the Program	Mean Difference (I-J)	Std. Error	Sig. <sup>a</sup>	95% Confidence Interval for Difference <sup>a</sup>	
					Lower Bound	Upper Bound
First year students	Second year students	.581	.251	.083	-.055	1.216
	Third year students	.520	.262	.171	-.146	1.185
Second year students	First year students	-.581	.251	.083	-1.216	.055
	Third year students	-.061	.257	1.000	-.713	.591
Third year students	First year students	-.520	.262	.171	-1.185	.146
	Second year students	.061	.257	1.000	-.591	.713

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

*Professionalism*

### Tests of Between-Subjects Effects

Dependent Variable: ScalePPerceived

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2.467 <sup>a</sup>	2	1.234	2.820	.075	.158
Intercept	241.470	1	241.470	551.963	.000	.948
SchoolYearGroup	2.467	2	1.234	2.820	.075	.158
Error	13.124	30	.437			
Total	258.953	33				
Corrected Total	15.592	32				

a. R Squared = .158 (Adjusted R Squared = .102)

### Pairwise Comparisons

Dependent Variable: ScalePPerceived

(I) Year within the Program	(J) Year within the Program	Mean Difference (I-J)	Std. Error	Sig. <sup>a</sup>	95% Confidence Interval for Difference <sup>a</sup>	
					Lower Bound	Upper Bound
First year students	Second year students	.527	.276	.197	-.173	1.227
	Third year students	.629	.289	.113	-.104	1.361
Second year students	First year students	-.527	.276	.197	-1.227	.173
	Third year students	.101	.283	1.000	-.617	.819

Third year students	First year students	-.629	.289	.113	-1.361	.104
	Second year students	-.101	.283	1.000	-.819	.617

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

## VITA

Julie M. Cavallario

### *Department of Study*

Old Dominion University  
Department of Human Movement Sciences  
Student Recreation Center  
Norfolk, VA 23529

### *Education*

May 2015	Doctor of Philosophy, Human Movement Science Old Dominion University      Norfolk, Virginia
May 2005	Master of Education, Physical Education-Athletic Training Old Dominion University      Norfolk, Virginia
May 2003	Bachelor of Science, Athletic Training SUNY Cortland      Cortland, NY

### *Publications*

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