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Exploring Students' Use of Learning Contracts in Preparing for the National Athletic Training Board Certification Examination

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Exploring Students' Use of Learning Contracts in Preparing for the National Athletic Training Board Certification Examination

by

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Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work here at Lindenwood University and that I have not submitted it for any other college or university course or degree here or elsewhere.

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Abstract

The purpose of this study was to explore the application of learning contracts in the process of preparing to take the AT BOC exam. The goal of this study was to investigate best practices to assist students in being successful when taking the BOC certification examination. Self-directed learning in medicine was an important skill in the ever-changing healthcare landscape. One self-directed learning tool, learning contracts, had been studied in other healthcare fields. However, little research had been conducted utilizing learning contracts in athletic training. In addition, providing students with a research based instrument that could be used to improve success on the BOC examination would positively impact the profession of athletic training. Therefore, a mixed methods research study was implemented to study the usefulness of learning contracts in the preparation for the BOC examination. The data produced in the study showed that athletic training students were self-directed learners and that learning contracts were a useful tool when preparing for the BOC examination. Along with the Self-Assessment Exams (SAEs) produced by BOC, Inc., learning contracts were shown to be useful in helping students diagnose learning needs as well as creating a plan to study. Based on the outcomes of this study the researcher recommends that athletic training students, and athletic training programs, implement the use of learning contracts when preparing for the BOC examination. The researcher also recommends that students strongly consider using SAEs to diagnose learning needs or gaps.

Table of Contents

Acknowledgements i

Abstract ii

List of Tables vii

List of Figures ix

Chapter One: Introduction 1

Overview 1

Background 2

Rationale 3

Purpose of the Study 5

Research Questions and Hypotheses 6

Definition of Terms 7

Summary 8

Chapter Two: Literature Review 10

Introduction 10

History of Athletic Training Education 10

Domains of Athletic Training 20

Clinical Education 26

Certification 27

Job Settings 28

Clinics and Hospitals 29

Industrial or Occupational 30

College or University 30

Secondary Schools 30

Professional Sports 32
Amateur Sports 32
Performing Arts 33
Military, Law Enforcement, and Government 33
Health and Fitness Clubs 34
Andragogy 34
Andragogical Assumptions 35
Program Design 38
Self-Directed Learning 41
Self-Directed Learning in the Medical field 43
Measuring Self-Directedness 45
Self-Directed Learning in Athletic Training 47
Learning Styles 51
Learning Contracts 55
Designing Learning Contracts 64
Summary 67
Chapter Three: Methodology 69
Introduction 69
Theoretical Framework 69
Rationale 71
Research Question and Null Hypotheses 71
Study Population 72
Relationship to Participants 74
Research Setting 75
Research Instrumentation 75

Threats to Internal Validity 81
Time Line 83
Data Collection 84
Data Analysis Procedures 86
Summary 87
Chapter Four: Results 88
Introduction 88
Analysis 88
Qualitative Results 101
Summary 108
Chapter Five: Summary and Discussion 110
Summary of Findings 111
Research Question 111
Null Hypothesis One 111
Null Hypothesis Two 112
Null Hypothesis Three 112
Null Hypothesis Four 112
Null Hypothesis Five 113
Null Hypothesis Six 114
Practical Implications 114
Limitations 115
Recommendations for Future Research 117
Conclusion 117
References 119

Appendices 130

Appendix A: Learning Contract Example 130

Appendix B: Participant Learning Contract 131

Appendix C: Self-Directed Learning Readiness Scale 132

Appendix E: Perceived Benefits of Contract Learning Questionnaire 136

Appendix F: Sample BOC Self-Assessment Exam 138

Appendix G: Self-Assessment Exam mode score example 142

Appendix H: Learning Contract Group Recruiting Email 143

Appendix I: BOC, Inc SAE Approval Letter 145

Appendix J: SAE Only Group Recruiting Email 146

Appendix K: Exam Preparedness Survey 147

Vitae 148

List of Tables

Table 1: 2013-2015 Three-Year Aggregate First Time Pass Rate of Athletic Training..... 4

Table 2: 1959 Athletic Training Curriculum Model..... 11

Table 3: Required Formal Instruction in Athletic Training Programs..... 13

Table 4: Minimum Degree Requirements..... 14

Table 5: Domains from Practice Analysis, 7th Edition 20

Table 6: Tasks in Domain 1..... 22

Table 7: Tasks in Domain 2..... 23

Table 8: Tasks in Domain 3..... 24

Table 9: Tasks in Domain 4..... 25

Table 10: Tasks in Domain 5..... 26

Table 11: Grow's Stages of Learning Autonomy..... 42

Table 12: Self-Directed Learning Readiness 45

Table 13: Sample Learning Plan..... 48

Table 14: Reliability Analysis for Self-Directed Learning Survey 77

Table 15: Practice Anaylsis, 7th Edition BOC Exam Content 80

Table 16: Practice Analysis, 6th Edition BOC Exam Content 81

Table 17: Threats to Internal Validity..... 812

Table 18: Frequency Analysis for Select Group Variables 89

Table 19: Descriptive Statistics Analysis for Exam Preparedness Survey Questions 90

Table 20: Independent Samples T-Test for Exam Preparedness Survey Questions Comparing Contract Group versus Non-Contract Control Group..... 91

Table 21: Descriptive Statistics Analysis for Self-Directed Learning Readiness Scale Questions..... 93

Table 22: Independent Samples T-Test for Self-Directed Learning Readiness Scale Questions Comparing Contract Group Versus Non-Contract Control Group 95

Table 23: Passing Rates on the BOC Examination for Study Participants..... 96

Table 24: Passing Rates on the BOC Examination for Study Participants Versus Three-Year National Average Passing Rates 96

Table 25: Descriptive Statistics for Mean Scores of Self-Assessment Examinations and Final BOC Examination for Learning Contract Group and SAE Only Group 97

Table 26: Independent Samples T-Test Comparing Learning Contract Students to Control Group for Self-Assessment Examinations and Final BOC Examination 988

Table 27: Paired Sample T-Tests for Self-Assessment Examinations & BOC Examination Based upon Group Membership 98

Table 28: Correlation Analysis for GPA and BOC Raw Score..... 100

List of Figures

Figure 1. Program director highest earned degree adopted from CAATE analytic report 2014-2015 16

Figure 2. Dimensions of self-directed learning, Garrison's model..... 70

Figure 3. Enrollment by sex in CAATE accredited programs 2014-2015 74

Chapter One: Introduction

Overview

This study focused on student learning techniques used by athletic training students who prepared to take the Board of Certification (BOC) credentialing examination. More specifically, this study focused on the use of learning contracts to promote self-directed learning and the use of self-assessment examinations provided by the Board of Certification as tools to guide studying for the BOC examination. Medical professions such as physicians, nurses, and physiotherapists have used learning contracts for many years to facilitate self-directed learning. However, learning contracts have not been studied within the athletic training field. In most states, an individual must have been certified by the BOC and been recognized by the state through registration or licensure in order to practice athletic training. The only path for someone to become eligible to take the BOC exam was by attending a Commission on Accreditation of Athletic Training Education (CAATE) accredited athletic training program. CAATE accredited athletic training programs must maintain a three-year aggregate first-time pass rate of 70% or better (Commission on Accreditation of Athletic Training Education, 2017, p. 3). From 2013-2015 the overall three-year pass rate for first time test takers was 79% (CAATE, 2016b, para. 2). This pass rate may look sufficient at first glance but 25% of 371 entry-level undergraduate and graduate programs had a first time pass rate below 70% (CAATE, 2016b, para. 2). Very little research had been conducted on learning tools and techniques that students could utilize to promote a higher pass rate on the BOC examination. As student loan debt continued to increase, the federal government was demanding more transparency and responsibility for outcomes in higher education.

Athletic Training programs needed tools and techniques to foster learning and increase passing rates.

Background

Contract learning was an educational strategy that lined up well with the adult learning theory of andragogy and the assumptions of an adult learner. One assumption of adult learners was that adults had a need for self-directedness (Knowles, 1986). Self-directed learning should be a goal of all students as self-directed learning would be a skill that adults needed to foster life-long learning (Knowles, 1986). Using learning contracts was a method to promote self-directed learning in learners as it created a student-centered learning environment instead of a teacher-centered environment. Armstrong (2010) reported, for students to "Develop higher-order cognitive skills such as critical decision-making" (p. 22); the athletic training students should have had the opportunity to develop self-directed learning strategies (Armstrong, 2010). In most traditional learning environments students had very little input on learning because the classroom was teacher-centered or teacher-directed. The author went on to state that the main idea of self-directed learning for any student was the development of autonomy. This development could only occur if the student had the opportunity to "Plan, monitor, reflect, and assess their learning endeavors" (Armstrong, 2010, p. 21). The researcher believed that learning contracts could be used as a self-directed learning strategy that would enable athletic training students to develop self-directed learning strategies.

The theory of andragogy may be a good choice for athletic training education because of the recent decision to offer the professional degree at the master's level by the year 2022 (CAATE, 2015b, para. 5). This degree change will create an older student

population with a different focus on learning. According to the Council of Graduate Schools, as of this writing the average age of a graduate student was 32.4 years old (Bell, 2009, p. 2). However, age alone does not determine when a person becomes an adult. Knowles defined an adult learner as someone who was responsible for his or her own life (Knowles, Holton, & Swanson, 2012). There were six basic assumptions of the adult learner: the learner had a need to know and understands why they needed to learn something, the learner had a need to be self-directed, the learner had a unique experience that needed to be taken into account, the learner had life situations that readied them for learning, the learner was task-centered, and the learner was intrinsically motivated to learn (Knowles, 1986, pp. 41-42; Merriam, Caffarella, & Baumgartner, 2007, p. 84). Learning contracts could help facilitators meet these assumptions of the adult learner.

Rationale

Individuals who wanted to practice athletic training as a career must pass the BOC certification examination. The student became eligible to take the BOC examination once they had completed the coursework of a CAATE accredited athletic training program at a college or university. The CAATE was designed to "Develop, maintain, and promote educational standards for accredited athletic training programs" (CAATE, 2017, p. 1). Every accredited athletic training program must uphold these standards to maintain their accreditation status. According to the *Standards for Accreditation of Professional Athletic Training Programs* document, there were 109 standards that programs must adhere to (CAATE, 2017, p. 11). Standard 11 stated "Data analysis: Programs must meet or exceed a three year aggregate of 70 percent first-time pass rate on the BOC

examination" and 25% of programs were non-compliant with this standard (CAATE, 2017, p. 3). As shown in Table 1, 25% of documented non-compliance to standard 11 occurred from 2013-2015 (CAATE, 2017).

Table 1

2013-2015 Three-Year Aggregate First Time Pass Rate of Athletic Training

Degree	# Programs	# Non-Compliant	% Non-compliant
Bachelors	336	93	28%
Masters	35	1	3%
All Programs	371	94	25%

During this time the average of all programs first-time pass rate was 78% (CAATE, 2016b, para. 2). When compared to other healthcare professions the first-time pass rate for athletic trainers was low.

There were many healthcare professionals who must pass board examinations. Physicians, physician assistants, nurses, athletic trainers, and physical therapists were just a few healthcare professions with board certification examinations. According to the American Board of Internal Medicine (2016) during the period of 2013-2015 they reported a first-time pass rate of 87% (p. 1). Physician assistant students had to pass the physician assistant national certifying examination (PANCE) to become a certified physician assistant. From 2013-2015 the pass rate was 95% for first-time test takers (National Commission on Certification of Physician Assistants, 2015, p. 1). When the NCLEX-RN examinations for nurses pass rates were averaged the rate was 83% for the 2013-2015 first time test taker (National Council of State Boards of Nursing, 2014, 2015, 2016, p. 1). The researcher believed the first-time passing rates of other healthcare professions revealed athletic training education needed to produce

increased outcomes in education. The researcher believed a potential way to address this was through implementation of best practices during the student's athletic training education or BOC examination study preparation.

Athletic Training education programs had consequences for not meeting the CAATE standards in place for accreditation. Standard 11, as mentioned previously, had a 25% non-compliance rate (CAATE, 2017, para. 2). In February 2016, CAATE (2016a) stated:

> All programs with a 3-year aggregate first time pass rate below 70% are non-compliant with Standard 11 and will be placed on probation. Programs placed on probation for non-compliance with Standard 11 will be required to complete both an analytic progress report and an action plan. (p. 2)

Purpose of the Study

The purpose of this study was to explore the application of learning contracts in the process of preparing to take the AT BOC exam. The goal of this study was to investigate best practices to assist students in being successful when taking the BOC certification examination. Students were qualified to take the BOC exam in the last semester of the Athletic Training education program or immediately following graduation. To date, there was little information in the research literature describing what characteristics existed for programs, students, and teaching strategies that could increase first-time passing rates on the BOC examination. Additionally, the NATA Research and Education Foundation were looking for answers to the following question: What are efficient and effective education methods (model practices) in AT education (NATA Research & Education Foundation, 2017)? This research could add knowledge to the

application of adult learning strategies that fostered self-directedness of students preparing for the BOC exam.

Research Questions and Hypotheses

The study focused on the following research question: What is the relationship between the use of learning contracts and successful preparation for the BOC as measured by passing rates on the BOC exam?

The study also focused on six research hypotheses:

H1: There is a difference in scores for Exam Preparedness, when viewing students who use learning contracts and SAEs compared to students who use SAEs without a learning contract.

H2: There is a difference in scores for Self-Directed Learning Readiness when viewing students who use learning contracts and SAEs compared to students who use SAEs without a learning contract.

H3: There is a difference in first-time pass rates on the BOC examination, when viewing students who use learning contracts and SAEs compared to students who use SAEs without a learning contract.

H4: There is a difference in first-time pass rates on the BOC examination, when comparing the three-year national average passing rates to the pass rates of students who used learning contracts and SAEs or the SAE only group.

H5: There is a difference in scores for Self-Assessment Examinations and BOC Scores when comparing students who use learning contracts and students who choose not to.

H6: There is a relationship of Grade Point Average to success on the BOC examination regardless of participation in SAEs or a student-self-developed learning contract.

Definition of Terms

*Andragogy: "*The art and science of adult learning" (Knowles, 1980, p. 43).

Athletic training: The field of providing healthcare to a variety of patient populations in general. Traditionally athletic training has been concerned with providing healthcare to athletes. "Athletic training is practiced by athletic trainers (AT's), health care professionals who collaborate with physicians and specialize in preventing, recognizing, managing, and rehabilitating injuries" (Prentice, 2014, p. 3).

Board of Certification, Inc.: The BOC, a non-profit organization, has been responsible for certifying athletic trainers since 1969. The BOC began as the National Athletic Trainers Association Board of Certification (NATABOC) and was later incorporated in 1989 as an independent non-profit. The NATABOC officially changed its name to the BOC in 2004 (Prentice, 2014). In order to become a nationally certified athletic trainer, candidates must score a minimum of 500 points out of 800 (Board of Certification, Inc., 2016b, p. 15).

Commission on Accreditation of Athletic Training Education: The Commission on Accreditation of Athletic Training Education (CAATE) is a 501(c)(3) non-profit organization currently incorporated in Texas. The CAATE was recognized as an accrediting agency by the Council of Higher Education (CHEA) and was the sole accrediting body for athletic training curriculums in the United States. The mission of

The CAATE was to define, measure, and continually improve AT education (CAATE, 2016c).

*Learning contracts: "*An alternative way of structuring a learning experience: It replaces a content plan with a process plan. Instead of specifying how a body of content will be transmitted (content plan), it specifies how a learner will acquire a body of content (process plan)" (Knowles, 1986, pp. 39-40).

*Pedagogy: "*The art, science, of helping children learn" (Knowles, 1980, p. 43) or a word derived from the Greek word *paid* meaning child and *angogus* meaning leading. Therefore, the literal definition means, the art and science of teaching (leading) children (Knowles, 1980~~p. 40~~; Knowles et al., 2012).

Self-assessment examination (SAE): Online tests administered on the BOC website for students to use to prepare for the BOC certification examination. Certified athletic trainers may also use these tests to assess continuing education (CE) needs. Content writers who developed the BOC exam created the questions within the self-assessment exams. They wrote the tests questions in likeness to the BOC certification exam. These exams assisted in determining potential areas of strength and weakness in athletic training for future study or CE needs (Board of Certification, Inc., n.d.).

Summary

Even though athletic training was a relatively young healthcare profession dating back to the 1950's, the profession was still responsible to educate and certify athletic trainers. The CAATE had set specific requirements for educational programs first-time BOC pass rates at 70% (CAATE, 2017, p. 3). These pass rates were reported on a three-year rolling average and had become known as CAATE standard 11. This standard

placed pressure on institutions to produce students who could pass the BOC exam on their first attempt. As of this writing, there was a dearth of literature on education techniques conducive to helping students improve their performance on the BOC examination. Hence, this study focused on the use of learning contracts to promote self-directed learning and the use of self-assessment examinations from the BOC as tools to guide studying for the BOC examination. By identifying education techniques athletic training students could use to improve success on the BOC examination, athletic training education programs may improve first time BOC success rates.

Chapter Two: Literature Review

Introduction

The landscape of athletic training education was quickly changing in hopes of keeping up with an ever evolving healthcare system. There had been few educational changes to the athletic training curriculum since its introduction in 1959 however, the changes in the healthcare system were at the forefront causing the profession to change. The profession of athletic training committed to changing the athletic training professional degree level to a master's degree to meet the changing healthcare needs. This change inevitably would create an older, adult student with more life experiences. It had been theorized that the andragogical educational philosophy would benefit adult students as they continued on a lifelong learning journey. The foundation of andragogy had been traced back to a man by the name of Malcolm Knowles. Knowles had been referred to as the father of andragogy in the United States and many of his theories were still used as of this writing.

History of Athletic Training Education

In 1950 the National Athletic Trainers Association (NATA) was founded on the purpose to "Build and strengthen the profession of athletic training through the exchange of ideas, knowledge, and methods of athletic training" (Delforge & Behnke. 1999, p. 53). The first athletic trainer's association created did not last due to World War II. A short while later in 1955 the NATA Committee on Gaining Recognition was appointed by William E. Newell. This committee focused on professional development and quickly came to the conclusion that Athletic Training education and a national certification should be a major focus (Newell, 1984). The committee worked for three years to

develop an educational curriculum that would be approved by the NATA Board of Directors. Table 2 shows the first athletic training education curriculum model that was adopted in 1959.

Table 2

1959 Athletic Training Curriculum Model

Courses
Physical Therapy school prerequisites (minimum 24 semester hours)
Biology/zoology (8 semester hours)
Physics and/or chemistry (6 semester hours)
Social Sciences (10 semester hours)
Electives (e.g., hygiene, speech)
Specific Course Requirements (if not included above)
Anatomy
Physiology
Physiology of Exercise
Applied Anatomy and Kinesiology
Laboratory physical science (6 semester hours, chemistry and/or physics)
Psychology (6 semester hours)
Coaching techniques (9 semester hours)
First Aid and safety
Nutrition and foods
Remedial exercise
Organization and administration of health and physical education
Personal and community hygiene
Techniques of athletic training
Advanced techniques of athletic training
Laboratory practices (6 semester hours of equivalent)
Recommended courses
General Physics
Pharmacology
Histology
Pathology

This initial curriculum was designed to prepare students as athletic trainers, secondary school teachers, and to complete prerequisites to enter a physical therapy school. It took almost a decade before any university undergraduate athletic training program came

forward for NATA approval. In 1969, four athletic training education programs were the first to be recognized by the NATA and included Mankato State University, Indiana State University, Lamar University, and the University of New Mexico (Delforge & Behnke, 1999, p 55).

The 1959 curriculum would be slightly revised from time to time until the mid-1970's when the focus moved away from physical therapy to more specific study of athletic training. The NATA would continue to be responsible for approval of athletic training education programs until 1993 when the Joint Review Committee on Athletic Training (JRC-AT) was tasked with this approval process. The AMA Committee on Allied Health Education and Accreditation (CAHEA) and the NATA Professional Education Committee created the JRC-AT to develop standards and guidelines to govern and review CAHEA accreditation of entry-level athletic training education programs. Once completed, the first two programs Barry University and High Point University, were accredited in February of 1994 (Delforge & Behnke, 1999, p. 59). A short while later, in July 1994, CAHEA was dissolved and became the Commission on Accreditation of Allied Health Education Programs (CAAHEP) and was the new accrediting body. Four years after the first 2 programs were accredited by CAHEA, CAAHEP had approved 82 entry-level programs with additional programs being reviewed in the fall of 1998. This marked the completion of the transition away from the NATA to CAAHEP accreditation of entry-level athletic training education programs. CAAHEP and the JRC-AT, a committee on accreditation under CAAHEP, continued to serve as the accreditation body until June 30, 2006. At that time the JRC-AT became independent from CAAHEP and changed its name to Commission on Accreditation of Athletic Training Education

(CAATE). CAATE continues to operate as the accreditation body for Athletic Training Education as of this publication.

As of 2017, CAATE had accredited more than 360 professional entry-level athletic training programs with the vast majority of them being accredited at the baccalaureate level. The professional education required as an athletic trainer in 2017 focused on providing patient care in five domains of clinical practice. The domains were prevention; clinical evaluation and diagnosis; immediate and emergency care; treatment and rehabilitation; and organization and professional health and well-being. Table 3 shows subject matter that must be included in formal instruction for an athletic training student.

Table 3

Required Formal Instruction in Athletic Training Programs

Subject Matter
Evidence-based Practice
Prevention and Health Promotion
Clinical Examination and Diagnosis
Acute Care of Injury and Illness
Therapeutic Interventions
Psychosocial Strategies and Referral
Healthcare Administration
Professional Development and Responsibility

Additionally, students were required to apply their knowledge through extensive clinical integration. This came in the form of providing healthcare to patients while being supervised and mentored by a trained preceptor. The students learned by using the didactic portion of their education and applying it to real life patients. Students in the athletic training program were required to obtain a minimum of two years of clinical integration.

In December of 2013, a committee of athletic trainers presented a white paper to the National Athletic Trainers' Association Board of Directors titled, Professional Education in Athletic Training: An Examination of the Professional Degree Level. This paper detailed 11 key findings and ended in a recommendation that the athletic training professional education should occur at the master's degree level.

The findings were based on several aspects that could be considered positive reasons to change. The positive reasons included considerations on degree of other healthcare professionals and gaining recognition within the healthcare community. It was noted that many peer healthcare fields are currently or working toward providing their professional education at the master's degree level or higher. This can be seen in Table 4.

Table 4

Minimum Degree Requirements

Profession	Minimum Degree Required
Occupational Therapy	Master's Degree
Physical Therapy	Doctorate Degree
Speech & Language Pathology	Master's Degree
Nursing	Associate's Degree
Registered Dietician	Bachelor's Degree
Physician Assistant	Bachelor's Degree (mandate all programs at the master's degree level by 2020)

Although, professional education was left up to each individual profession, the perceived lack of education could have a negative effect for athletic training in the evolving healthcare field. Additionally, the degree change could increase retention of athletic trainers, allow for the creation of a strong foundation in health-related basic sciences during undergraduate studies, increase employment settings and compensation,

increase the selection of more qualified students, and help facilitate inter-professional education.

Entry-level Athletic Training Education was currently being offered at both the bachelor and post-bachelor degree level. However, on May 20, 2015 the Strategic Alliance announced that the professional degree must be at the master's degree level. In September 2015 CAATE approved a change that required Athletic Training Programs to only offer the entry-level degree at the master's degree level. CAATE also put a timeline in place stating "Baccalaureate programs may not admit, enroll, or matriculate students into the athletic training program after the start of the fall 2022 term" (CAATE, 2015b, para 5). Several other competencies and standards changed because of the degree level change including standard 2 that mandated the entry-level professional degree be offered only as a master's degree. If athletic training education programs did not meet this standard they would have to close their program.

The degree change was not without potential problems. Pitney (2012) expressed concerns about what could happen when the AT profession moves to the entry-level master's degree. Pitney (2012) had three main concerns that included: lack of qualified faculty, negative economic impact on the athletic training students, and lastly the economic impact on faculty because of the reduction of athletic training programs (Pitney, 2012, p. 5).

The lack of qualified faculty came from the notion that most institutions of higher education required faculty members to have earned a degree one level higher than they were teaching. This would require that athletic training faculty have earned a doctorate degree to teach at the master's level. This was supported by the fact that the Higher

Learning Commission (HLC) stated that qualified instructors were those that possessed an academic degree that was both relevant and at least one level above the level they taught unless they taught in a terminal degree program (Higher Learning Commission, 2016). The HLC was one of six regional post-secondary education accreditors in the United States. The lack of qualified faculty was partially illustrated in the 2014-2015 CAATE Analytic Report. The report documented that out of 372 professional athletic training degree programs 63.2% of Athletic Training program directors held an academic doctorate degree and is shown in Figure 1 (CAATE, 2015a, p. 18)

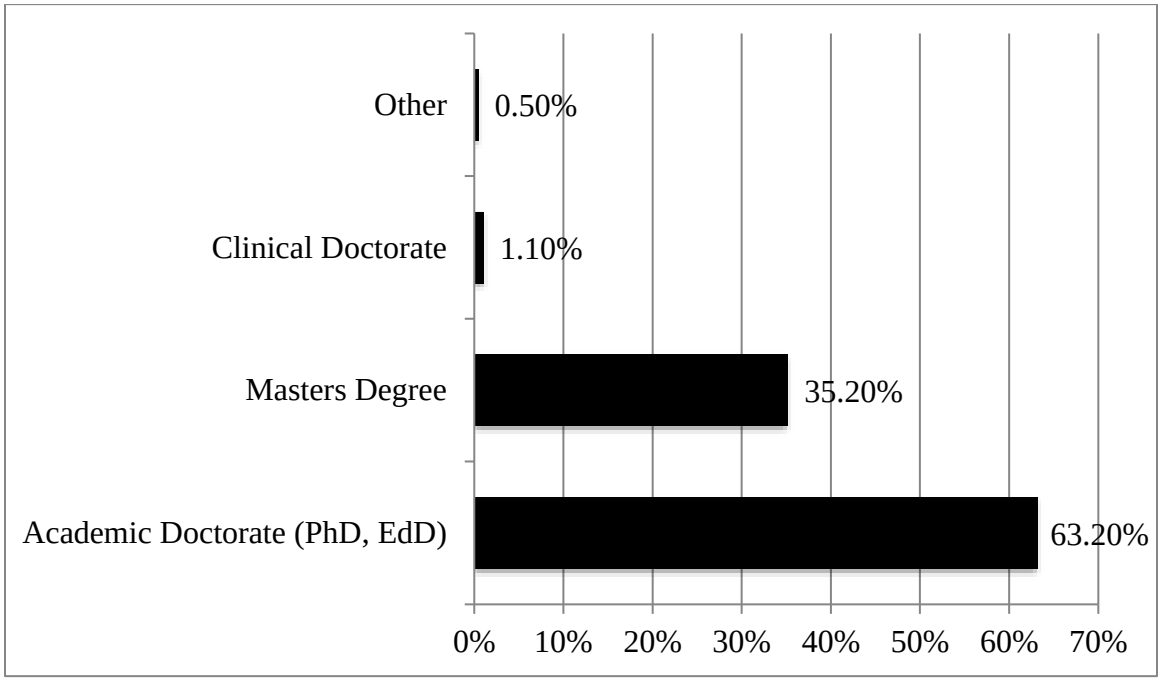

Figure 1. Program director highest earned degree adopted from CAATE analytic report 2014-2015.

Based on HLC's required faculty qualifications and the documented number of athletic training program directors with an academic doctoral degree it could be assumed that there was a shortage of qualified faculty in the athletic training profession.

The second concern Pitney (2012) mentioned was the concern that the required degree change would have a negative economic impact on students. The move to the master's degree would require students to spend five to seven years in school to be eligible to take the BOC examination. As students attended school for a longer time frame, many will incur an increase in student loan debt. According to the National Center for Education Statistics, undergraduate students between the ages of 18-24 who were in their fourth year of college or above had an average student loan debt of $26,400 in 2011-2012 (Kena et al., 2016, p. 251). It can be assumed that the students who took out student loans to obtain an undergraduate degree would also need to take out loans to earn a graduate degree in athletic training placing them further in debt forcing them to carry that debt for a longer period of time. This could potentially be offset if a master's degree in athletic training increased earnings compared with other peer healthcare professions. For instance, according to the United States Department of Labor, the median salary in 2015 for athletic trainers was $44,670, occupational therapists was $80,150, orthotists and prosthetists was $64,430, and physical therapists was $84,020 (United States Department of Labor, 2015, para. 4).

Pitney (2012) expressed concern over the impact on the faculty at institutions that did not grant graduate degrees. The outcomes for these faculty members would be limited to potentially teaching in another program at the institution if qualified, relocate to teach at an institution that offered the entry-level master's degree, or possibly move from higher education into a clinical athletic trainer position. While this has likely happened to some athletic training educators, the CAATE has seen a growth in professional programs during the 2014-2015 year (CAATE, 2015a). CAATE accredited

375 professional programs in 2014-2015 an increase of seven additional programs from the previous year in addition to 24 institutions that had submitted an application showing interest in starting a new professional program (CAATE, 2015a, p. 4).

Additionally, CAATE stated that starting in February 2017 athletic training programs that were on probation and had a first time pass rate below 50% would remain non-compliant and accreditation would be withdrawn (CAATE, 2016a, p. 2). The analytic report mentioned above required an analysis of the previously submitted action plan, the programs current pass rate, as well as any progress toward gaining compliance, as well as a projection of the following year's anticipated exam outcomes (CAATE, 2016a). The action plan was the second part of the probation status that needed to be completed. The action plan must include all of the components of Standard 13.

The Commission on Accreditation of Athletic Training Education (CAATE) must accredit athletic training education programs if the athletic training program desired the graduate to be eligible for certification through the BOC examination. Accreditation was a voluntary process that the sponsoring institution agreed to be subjected to and was assessed against the Standards for Accreditation of Professional Athletic Training Programs developed by the CAATE (2015c). Initial accreditation involved a three-step process. This process included a self-evaluation in the form of a self-study, a peer review of the self-study through a site visit to confirm accuracy, and lastly a final recommendation to CAATE (2015c) by the review committee. Institutions needed to work closely with CAATE and allow ample time for the entire process to play out. Normally, the accreditation process took a minimum of 12 months with a maximum of 24 months (CAATE, 2015c, p. 13).

The first step in the accreditation process was completion of a self-study. The self-study was the main component of a comprehensive review of the program offered by an institution. The self-study was considered the foundation of the peer review process. The report required details on every aspect of the program and included program sponsorship, outcomes, personnel, program delivery, health and safety, financial resources, facilities and instructional resources, operational policies and fair practices, program description and requirements, student records, and distance learning when appropriate (CAATE, 2015c). All aspects of the program needed to function when the self-study was submitted (CAATE, 2015c).

The second component of the accreditation process was described as the site visit. Peer evaluators conducted the site visit with the goal of validating the information contained within the self-study report (CAATE, 2015c). During the site visit, evaluators used the review criteria known as 'Professional Standards' and comprehensively reviewed both the didactic and the clinical aspects of the educational program. The site visit lasted approximately three days. Once the site visit was completed, the institution received a site visit report approximately one week after the visit. The final report came from the CAATE approximately six to eight weeks after the conclusion of the site visit (CAATE, 2015c, p. 11).

A response from the program was common in the form of a rejoinder. The rejoinder must address "Errors, misinterpretations, clarifications, recommendations, and/or deficiencies, and any non-compliances" noted by the site visit team (CAATE, 2015, p. 11). If no deficiencies were noted, then the program would accept the site visit

report as the report was received. Once CAATE (2015) received the rejoinder the review team evaluated the rejoinder to determine if the program met the standards.

Once the rejoinder had been submitted, CAATE (2015) reviewed the site visit report, the rejoinder, and all supporting documentation to determine an accreditation status. In a programs' initial bid to become accredited they could be awarded a maximum of five years of accreditation (CAATE, 2015, p. 12). If the accreditation was a continuing accreditation the program could be awarded up to ten years of re-accreditation by CAATE. The CAATE would determine the actual accreditation length awarded and notify the program.

Domains of Athletic Training

As mentioned earlier, there were five domains that had been identified by the BOC that encompassed the roles of an athletic trainer. A panel of experts appointed by the BOC helped produce updated domains through a document called Practice Analysis, 7th Edition (Henderson, 2015). The domains can be seen in Table 5.

Table 5

Domains from Practice Analysis, 7th Edition

Domain	Name
I	Injury and Illness Prevention and Wellness Promotion
II	Examination, Assessment and Diagnosis
III	Immediate and Emergency Care
IV	Therapeutic Intervention
V	Healthcare Administration and Professional Responsibility

Note. Adapted from "The 2015 athletic trainer practice analysis study," by J. Henderson, 2015, p. 88.

These domains took effect in April 2017 for BOC exam candidates (Henderson, 2015). These new domains were slightly different from the previous role delineation study/practice analysis, 6th edition. In the 6th edition the domains were known as: 1)

injury/illness prevention and wellness protection; 2) clinical evaluation and diagnosis; 3) immediate and emergency care; 4) treatment and rehabilitation; and 5) organizational and professional health and well-being (Johnson, 2010). The 6th edition was in effect for BOC examination candidates from April 2011 through February 2017. Each of the Practice Analysis, 7th Edition domains have been further broken down into tasks. These tasks defined roles in each domain that an entry-level athletic trainer must be able to perform (Henderson, 2015).

The first domain, injury and illness prevention and wellness promotion was extremely important and could be considered the cornerstone of the athletic trainer's role (Henderson, 2015). The overarching idea behind domain 1 was stated as "Promoting healthy lifestyle behaviors with effective education and communication to enhance wellness and minimize the risk of injury and illness" (Henderson, 2015, p. 14). If an athletic trainer could prevent injury and illness then there was not a need to perform tasks within other domains such as first aid or rehabilitation (Prentice, 2014). Ways that an athletic trainer could minimize injury or illness may include performing pre-participation physical examinations, monitoring environmental conditions and making recommendations to promote safe participation, ensuring that the athlete had appropriate training and conditioning, selecting and maintaining properly fitted protective equipment, and making sure the athlete was making appropriate nutrition choices for both participation and maintaining a healthy lifestyle (Prentice, 2014). As mentioned earlier each domain was broken into tasks, domain 1 identified 6 task statements and are presented in Table 6.

Table 6

Tasks in Domain 1

Task	Name
1	Implement plans to aid in risk reduction using currently accepted and applicable guidelines.
2	Educate individuals and stakeholders about the appropriate use of personal equipment.
3	Minimize the risk of injury and illness by monitoring and implementing plans to comply with regulatory requirements and standard operating procedures for physical environments and equipment.
4	Facilitate personal and group safety by monitoring and responding to environmental conditions (e.g. weather, surfaces, client work setting).
5	Optimize wellness (e.g. social, emotional, spiritual, environmental, occupational, intellectual, physical) for individuals and groups.

Note. Adapted from "The 2015 athletic trainer practice analysis study," by J. Henderson, 2015, p. 79.

The second domain, examination, assessment and diagnosis were important as well and had been overwhelmingly identified as work a newly certified athletic trainer must perform (Henderson, 2015). The idea behind this domain was "Implementing systematic, evidence-based examinations and assessments to formulate valid clinical diagnosis and determine patients' plan of care" (Henderson, 2015, p. 25). In the second domain the athletic trainer was expected to follow an evidence-based clinical decision-making process (Henderson, 2015). Evidence-based medicine was not just about identifying research but included clinical expertise, clinical experience, current best practices, and patient values (Starkey & Brown, 2015). Often the athletic trainer was the first line of care for the athlete and must be skilled in injury recognition, evaluation, and

diagnosis. Once a diagnosis had been made the athletic trainer must be able to appropriately refer the athlete for additional care when needed (Prentice, 2014). There were five tasks under domain 2 and they can be seen in Table 7.

Table 7

Tasks in Domain 2

Task	Name
1	Obtain an individual's history through observation, interview and review of relevant records to assess injuries and illnesses and to identify comorbidities.
2	Perform a physical examination that includes diagnostic testing to formulate differential diagnosis.
3	Formulate a clinical diagnosis by interpreting the history and the physical examination to determine the appropriate course of action.
4	Interpret signs and symptoms of injuries, illnesses or other health-related conditions that require referral using medical history and physical examination to ensure appropriate care.
5	Educate patients and appropriate stakeholders about clinical findings, prognosis and plan of care to optimize outcomes and encourage compliance.

Note. Adapted from "The 2015 athletic trainer practice analysis study," by J. Henderson, 2015, p. 81.

These tasks helped define the knowledge and skills the entry-level athletic trainer must possess in domain 2.

Immediate and emergency care was the third domain recognized in the Practice Analysis, 7th edition (Henderson, 2015). In domain three, athletic trainers must "Integrate best practices in immediate and emergency care for optimal outcomes" (Henderson, 2015, p. 83). Often the athletic trainer provided the first line of healthcare,

as they were typically onsite to provide immediate emergency care to their patients. Henderson (2015) identified 4 tasks in domain 3 and the tasks can be seen in Table 8.

Table 8

Tasks in Domain 3

Task	Name
1	Establish, review and/or revise emergency action plans to guide appropriate and unified response to events and optimize outcomes.
2	Triage to determine whether conditions, injuries, or illnesses are life threatening.
3	Implement appropriate emergency and immediate care procedures to reduce the risk of morbidity and mortality.
4	Interpret signs and symptoms of injuries, illnesses or other health-related conditions that require referral using medical history and physical examination to ensure appropriate care.
5	Educate patients and appropriate stakeholders about clinical findings, prognosis and plan of care to optimize outcomes and encourage compliance.

Note. Adapted from "The 2015 athletic trainer practice analysis study," by J. Henderson, 2015, p. 83.

When performance data was collected regarding newly certified athletic trainers, these tasks were identified as skills that more than 75% of the athletic trainers performed during the athletic trainers first six months (Henderson, 2015, p. 83).

Domain 4, therapeutic interventions were the next domain identified in the Practice Analysis, 7th Edition. Therapeutic interventions were defined as "Reconditioning injuries, illnesses and general medical conditions to promote optimal activity level based on core concepts using applications of therapeutic exercise, modality devices, pharmacology and manual therapy techniques" (Henderson, 2015, p. 84). In the therapeutic interventions domain there were 7 tasks. These tasks can be seen in Table 9.

Table 9

Tasks in Domain 4

Task	Name
1	Optimize patient outcomes by developing, evaluating and updating the plan of care.
2	Educate patients and appropriate stakeholders using pertinent information to optimize treatment and rehabilitation outcomes.
3	Administer therapeutic exercises to patients using appropriate techniques and procedures to aid recovery to optimal function
4	Administer therapeutic devices to patients using appropriate techniques and procedures to aid recovery to optimal function.
5	Administer manual techniques to patients using appropriate methods and procedures to aid recovery to optimal function.
6	Administer therapeutic interventions for general medical conditions to aid recovery to optimal function.
7	Determine patients' functional status using appropriate techniques and standards to return to optimal activity level

Note. Adapted from "The 2015 athletic trainer practice analysis study," by J. Henderson, 2015, p. 84-85.

In Practice Analysis 7, survey participants overwhelmingly indicated that newly certified athletic trainers performed all 7 tasks in this domain within their first six months.

Domain 5 was identified in the Practice Analysis, 7th edition as healthcare administration and professional responsibility (Henderson, 2015). This was the final domain in the practice analysis and further explains that athletic trainers, as healthcare providers, needed to use best practices in developing policies, procedures, and basic

business practices to promote optimal patient care (Henderson, 2015). The tasks identified in domain 5 can be seen in Table 10.

Table 10

Tasks in Domain 5

Task	Name
1	Evaluate organizational, personal, and stakeholder outcomes.
2	Develop policy, procedure and strategy to address risk and meet organizational needs.
3	Practice within local, state and national regulations
4	Use established documentation procedures to ensure best practices.

Note. Adapted from "The 2015 athletic trainer practice analysis study," by J. Henderson, 2015, p. 87.

The tasks identified within domain 5 were not typically tasks that athletic trainers thought about or were engaged in on a daily basis. This did not diminish the fact that newly certified athletic trainers performed these tasks within six months of certification.

Clinical Education

Clinical education in healthcare education had been around since the beginning of time. Clinical practice had always been at the heart of students' medical education and was so important in training the novice healthcare provider and helping them become a competent practitioner (Weidner & Henning, 2002). This experience had been seen in healthcare fields such as physician, nursing, physical therapy, and athletic training to name a few. In the mid-1970's athletic training clinical education began and required a minimum of 600 – 800 hours supervised by a certified athletic trainer (Weidner & Henning, 2002). Initially clinical education was not very structured as the student was typically seen as another worker (Weidner & Henning, 2002). In 2017 the clinical

experience was much more structured as most professions were using a trained clinical preceptor. A clinical preceptor or preceptor had been defined by CAATE as "A certified/licensed professional who teaches and/or evaluates students in a clinical setting using an actual patient base" (CAATE, 2017, p. 14). Even though athletic training had developed a more structured clinical experience it was perceived by entry-level certified athletic trainers that just over half of their professional education development came from their clinical education (Weidner & Henning, 2002). This was contrasted by clinical education in physical therapy that had been perceived to be around 23% - 30% of their total education (Weidner & Henning, 2002, p. 222).

Certification

Certification as an athletic trainer became a "hot" topic of discussion in the early 1960's. What the people in the profession noticed was that the best-qualified athletic trainers were exiting the field because of unfavorable work conditions and/or financial reasons. Members of the profession began to fear that if a standard of competence were not developed it would be overrun by unqualified individuals. More and more athletic trainers recognized that it was more about whom you knew than what you knew. In 1962, the NATA Board asked the Professional Advancement Committee to begin looking into a professional certification. This was the beginning step to move athletic training from a trade to a profession. The idea of a certification exam was ground breaking for the profession. The committee knew that they would have some opposition so they asked for input from the membership. According to McLean, "We got great cooperation from the entire membership. I don't think I got one questionnaire back that was violently negative" (as cited in Ebel, 1999, p 36). This defused a potential problem and was

followed by the current membership being "grandfathered" in so they would not have to take the exam (Ebel, 1999). At that time the NATA Board authorized the American Health Association's Professional Examination Service to develop a certification examination. This exam contained 150 multiple choice questions and included oral and practical sections. Many of the early questions were not as specific to athletic training as the committee wanted, as they had to borrow questions from allied health professions. These questions did test the knowledge of anatomy and physiology. The first certification examination was administered to 28 candidates, in August 1970 in Waco, Texas (Ebel, 1999, p. 37). The BOC exam changed formats in 2007 to a computer-based delivery system. Not only did the delivery change but also the exam changed by eliminating the oral section of the examination.

Job Settings

The athletic trainer provided healthcare to a wide range of patients in a variety of practice settings. As of this writing the athletic trainer has many more job opportunities that lie outside the normal college, university, or secondary school athletic clinics (Haff & Triplett, 2016; NATA, 2009; Prentice, 2014; Wright, Barker, Bennett, & Deere, 2013). Athletic trainers worked in settings that could be categorized as clinics and hospitals, industrial or occupational, corporate, colleges or universities, secondary schools, professional sports, amateur or recreational sports, performing arts, military, law enforcement, government, and health fitness clubs (NATA, n.d.; Prentice, 2014). These job settings continued to expand and grow as athletic trainers no longer treated just the athlete but instead they were concerned with treating the physically active (NATA, n.d.; Prentice, 2014; Wright et al., 2013).

Clinics and Hospitals

According to Prentice (2014), more athletic trainers worked in clinics and hospitals than any other setting. Prentice (2014) stated that approximately 40% of certified athletic trainers worked in the clinic and hospital setting. Often times these athletic trainers were contracted to provide practice coverage or game coverage to local high schools or small colleges (Prentice, 2014; Pryor et al., 2015; Wright et al., 2013). Other athletic trainers employed in the clinic and/or hospital setting worked in an outpatient rehabilitation clinic providing patient care or worked as an administrator (Pfeiffer, Mangus, & Trowbridge, 2015; Prentice, 2014). Some athletic trainers hired by a hospital worked within a physician's office and had been called physician extenders (Prentice, 2014). The term physician extender had become popular in the 1980's. The physician extender worked in an office that treated patients of all backgrounds and ages (Prentice, 2014). These athletic trainers could not provide care to just the physically active but were shown to provide a great benefit to the physician because of the athletic trainers' educational preparation in a variety of domains (Prentice, 2014). In January 2016, the NATA Committee on Professional Advancement made a recommendation to the NATA Board of Directors to eliminate the use of the term physician extender to describe an athletic trainer who works in a physician's office. The committee stated that the title should be athletic trainer in a physician's office. This served two purposes; the term physician extender did not identify what the athletic trainer really did and it didn't adequately describe the credentials held by the health care providers in this position. The term athletic trainer in a physician's office is now considered the appropriate title for that position.

Industrial or Occupational

The addition of athletic trainers in the industrial or occupational setting was becoming more common in 2017. Many of these employers were hiring athletic trainers to oversee the fitness and injury rehabilitation programs for their employees (Prentice, 2014; Wright et al., 2013). The athletic trainer working in this setting needed a strong knowledge of biomechanics, ergonomics, and the daily job tasks of the employee (Pfeiffer et al., 2015; Prentice, 2014). The athletic trainer was responsible for identifying problems at the workstation and making adjustments to the workplace to help prevent or reduce injuries (Prentice, 2014). Lastly, athletic trainers working in the industrial or occupational setting were asked to conduct wellness programs or seminars focusing on employee health (Prentice, 2014; Wright et al., 2013).

College or University

The college or university setting was a traditional employment setting for the athletic trainer. Every institution may have had a slightly different model based on size of the institution and number of student-athletes. Some institutions hired the athletic trainer as a full-time healthcare provider in the department of athletics. Others hired the athletic trainer in a split-appointment where they taught classes for part of the day and provided healthcare the remainder of the day. Lastly, the athletic trainer might have been hired full-time in academia. These individuals usually had a full teaching load and did not provide healthcare to the student-athletes. Instead, they served as a researcher or had some other administrative duty such as being a program director for an athletic training program (NATA, n.d.; Prentice, 2014).

Secondary Schools

Ideally, every secondary school would have a full-time athletic trainer working at the high school and/or middle school. In 2015, there was a benchmarking study published showing that 70% of 8,509 secondary schools responding had AT services available to the student-athletes (Pryor et al., 2015, p. 157). Full-time AT services only accounted for 37% of the responding schools while part-time AT services accounted for 31% of the responding schools (Pryor et al., 2015, p. 157). The reality was that if an athletic trainer was full-time they were likely to be employed as a teacher who may have had a reduced teaching load to provide athletic training services to the student-athletes (Pfeiffer et al., 2015; Prentice, 2014). This was not the case for all secondary settings as many had hired a full-time athletic trainer. Another way a secondary school might have athletic training services was by using a graduate assistant athletic trainer from a nearby college or university (Pfeiffer et al., 2015; Prentice, 2014). This was beneficial to both the school and the graduate assistant but might have kept the school from hiring a full-time athletic trainer (Prentice, 2014). Some school districts hired an athletic trainer who was at a central location and provided care to several schools within the district (Prentice, 2014). This had benefits such as saving the school district money and disadvantages that included that fact the athletic trainer cannot provide adequate care at all locations (Prentice, 2014). It was important to note that the American Medical Association, National Athletic Trainers Association, and the American Academy of Family Physicians all supported the use of athletic trainers to provide healthcare in secondary schools. For example, in 2012 the American Academy of Family Physicians Congress of Delegates made a policy stating “The AAFP encourages high schools to have, whenever possible, a National Athletic Trainers Association (NATA)-certified or registered/licensed athletic

trainer as an integral part of the high school athletic program" (American Academy of Family Physicians, 2012, para. 1).

Professional Sports

Another job setting that an athletic trainer commonly worked was in professional sports. Regardless of the sport almost every professional team employed an athletic trainer (Prentice, 2014). These sports consisted of the common sports such as football, baseball, hockey, and basketball but also include some of the less known professional sports such as NASCAR, rodeo, and bull riding (Prentice, 2014; Wright et al., 2013). This was not an all-inclusive list of professional sports that athletic trainers were employed in but rather a few examples. These athletic trainers were responsible for just the one team and worked with a larger healthcare team. This setting could be desirable to some but also came with struggles such as high pressure to win and a lack of job stability due to the likelihood of coaching turnover (Pfeiffer et al., 2015).

Amateur Sports

Amateur sport was yet another employment setting for athletic trainers. One of the better-known amateur sport organizations is the United States Olympic Committee (Prentice, 2014). These athletic trainers usually worked at one of several Olympic training centers in the U.S. to provide healthcare for a particular sport. The national governing body for each particular sport hired an athletic trainer or a group of athletic trainers to work with the national team or developmental program (Prentice, 2014). Communities also hired athletic trainers to provide healthcare for their recreational programs. The athletic trainers may be hired full-time but more often they were hired as independent contractors (NATA, n.d.; Prentice, 2014).

Performing Arts

The performing arts were a newer employment setting for athletic trainers. Entertainment companies who hired performers in the dance and theater performance arena used athletic trainers to care for the performers and the crew. Disney, casinos, and bands, to name a few, employed athletic trainers to provide healthcare to their groups. This employment setting continued to grow as more and more companies found value in hiring athletic trainers (American Kinesiology Association, 2011; Prentice, 2014).

Military, Law Enforcement, and Government

The military, law enforcement, and government were another employment setting for athletic trainers. The military had begun seeing value in preventing injuries as well as providing healthcare services to their troops (Cruz, 2013; Prentice, 2014; Siegle, 2013). In particular, the Navy, Marines, and Army started to emphasize injury prevention (Cruz, 2013; Prentice, 2014). Many of the hired athletic trainers were civilian contractors. However, it was believed that roughly 100 athletic trainers were active duty military (Prentice, 2014). The athletic trainers commonly worked in healthcare clinics but also may have provided services in the field (Cruz, 2013; Prentice, 2014). It was theorized that jobs in this setting would continue to grow.

Law Enforcement agencies at all levels, local, state, and federal employed athletic trainers. Police, firefighters, and the FBI were several examples of where these athletic trainers may have been found. Other government agencies also employed athletic trainers and included places like NASA, the United States Senate, and the Pentagon. When returning to work these professionals needed to be in excellent physical condition

otherwise they may have had an increased chance to become re-injured or an increased chance of death (Cartwright & Pitney, 2011; Prentice, 2014).

Health and Fitness Clubs

Many jobs existed for athletic trainers in the health and fitness industry. Some of these jobs existed providing healthcare while many others were based on providing performance enhancement to clients. These clubs could be a chain, franchise, or an independent club. In clubs that were providing healthcare, the athletic trainer would commonly care for the adolescent athlete, the aging athlete, and the occupational athlete (NATA, n.d.; Prentice, 2014).

Andragogy

The term "andragogy" could be linked back to many people over the course of time. However, three main people emerged as a catalyst for andragogy. These people were Alexander Kapp, Eduard Lindeman, and Malcolm Knowles. The earliest the term can be found is when Kapp wrote about it in 1833 (Knowles et al., 2012).

Kapp was a German High School teacher who wrote about andragogy in a way that did not explain the term or theory but justified it. Andragogy was described as the necessity to have a lifelong learning outlook (Knowles et al., 2012). He went on to justify it as a practical necessity for educating adults (Reischmann, 2004) where learning happened not just from teachers, but also through experiences and self-reflection (Knowles et al., 2012). It was unclear where he got the term and if he was the one responsible for creating it. It was clear however, that the idea of adult learning was not new in Europe or America as initiatives such as reading-societies and town libraries could be traced back to 1820-1840 (Knowles et al., 2012).

Eduard Lindeman was considered one of the major philosophers of adult education in the United States. He had been recognized as the first person to use the term andragogy in the United States. In 1926 he wrote a book titled "The Meaning of Adult Education" and in it he discussed four principles of adult education. Lindeman believed that the four principles were 1) education was a life-long process, 2) adult education was non-vocational, 3) adult education should emphasis situations not subjects, and 4) adult education should place primary emphasis on learner's experiences (Lindeman, 1961).

Malcolm Knowles had been called the father of adult education in the United States due to his work not only in theory but also in the practice of Andragogy. According to Henschke, Knowles did not just want the theory and practice to be used in the practical sense but he also wanted it applied beyond academia (Henschke, 2013a). Knowles began using the term "Andragogy" in 1967 and defined it as the art and science of helping adults learn (Knowles, 1986, p. 41). Later, Knowles realized that Andragogy could be used in youth education as several elementary and secondary schools began to report that they applied andragogical concepts and achieved superior learning (Knowles, 1980). Instead, Knowles pointed out that Andragogy was another model of assumptions about learners (Knowles, 1980). It had been said that Knowles' greatest benefit provided to the theory of Andragogy was providing a "unifying idea and identity" to the term (Knowles et al., 2012, p. 339).

Andragogical Assumptions

In Knowles' earliest definitions of Andragogy he pitted the learning of children against the learning of adults. Due to this theory it was necessary to define the word "adult" before getting into the assumptions of Andragogy. The term adult had been

defined in four logical ways by Knowles (Knowles et al., 2012). One way to define an adult was biologically, "Biologically, we become adults when we reach the age at which we can reproduce" (Knowles et al., 2012, p. 64). The second way adults could be defined is in a legalist view, "Legally, we become adults when we reach the age at which the law says we can vote, get a driver's license, marry without consent, and the like" (Knowles, et al., 2012, p. 64). Third, we could define an adult as when we begin taking on social roles such as full-time employment, being a spouse, or a parent (Knowles et al., 2012). The last way we could logically define an adult was psychologically and it was probably the most reasonable definition regarding learning. The psychological definition stated, "We become adults when we arrive at a self-concept of being responsible for our own lives, of being self-directing" (Knowles et al., 2012, p. 64). With this basic understanding or definition of an adult, we can begin to discuss some basic foundations of Andragogy.

According to Knowles' adult learning theory, Andragogy was based on six assumptions of adult learners (Knowles et al., 2012). These six assumptions were also known as "model of assumptions" or "system concepts" (Merriam et al., 2007, p. 85) and were as follows:

1. Adults had a need to know. Adults had a desire to understand why they needed to learn something if they were going to get the most out of it (Knowles, 1986). An adult would invest considerable time and energy into learning something they perceived as needed (Tough, 1971).

2. Adults had a need to be self-directed. As mentioned previously, the definition most appropriate in learning for an adult was the psychological definition. This

definition worked in conjunction with the self-directed assumption of an adult. Once this self-directed approach had been reached, an adult tended to resist being told what they needed to learn (Knowles, 1986).

3. Adults needed to include their experiences. Adults had a wide range of experiences both in quantity and quality. These experiences varied from person to person and would have a couple of consequences (Knowles, 1986). Experiences created an environment where there needed to be a focus on individualized learning and a focus on group tasks (Knowles, 1986). The idea of group tasks, or peer learning, was centered on the notion that the richest resources were each other because everyone had different experiences (Knowles, 1986). Dewey supported the idea that learner experiences were important as he wrote, "There is an intimate and necessary relation between the processes of actual experience and education" (Dewey, 1938, pp. 19-20).

4. The learners' readiness to learn. Adults were more ready to learn when the subject matter applied to their real-life situations (Knowles, 1986).

5. Task-centered or subject-centered learning. This assumption built off the previous assumption of readiness to learn. Adults were task-centered and willingly organized learning around life skills or tasks (Knowles, 1986).

6. The learners' motivation was intrinsic. Some motivation for adults was extrinsic such as pay, but the, "Deepest motivation comes from intrinsic motivators such as increases in self-esteem, responsibility, creativity, and self-fulfillment" (Knowles, 1986, p. 42).

It was important to know that the assumptions had grown over time. Originally, there were four assumptions in andragogy. The last two added were the motivation to learn and the need to know (Knowles et al., 2012).

Program Design

While studying pedagogy and andragogy the reader will notice that they resulted in two very different educational models or approaches. Pedagogy focused on a model that was content driven while andragogy focused on a process design model (Knowles, 1985). These theories tended to be on opposite ends of the spectrum.

Pedagogy's content plan required the teacher to answer four basic questions. The first question was, *What content needs to be covered?* The question implied that the teacher must cover all the content that was to be learned (Knowles, 1985). The next question to be answered was, *How can this content be organized into manageable units?* The third question was, *What would be the most logical sequence in which to present these units* (Knowles, 1985)? The fourth and final question to be answered in the content plan was, *What would be the most efficient means of transmitting this content?* These questions were designed to be teacher-centered (Knowles, 1985).

The andragogical process design had seven components. Before discussing the process design, it is important to note the difference in how the teacher was viewed. In the pedagogical model the teacher was considered the content expert while andragogy views the teacher as a facilitator of learning. The andragogical model assumed that the facilitator did not have all the answers and that there were many other resources available (Knowles, 1985; Mohammed, 2010).

The first element of the process design focused on setting the climate. Climate had two elements that must be considered, physical and psychological atmosphere (Knowles, 1985). The physical climate was very obvious; it should be conducive to learning. Knowles stated that the typical classroom was the least conducive to learning because it gave off the impression that the class was going to be all about one-way communication (Knowles, 1985). Instead it was recommended that the classroom be set-up in a giant circle or several small circles (Henschke, 2013b; Knowles, 1985). This classroom was more conducive for student-centered learning.

The second element of climate was the psychological element. The psychological element was probably more important than the physical element of climate (Knowles, 1985). There were several characteristics of the psychological climate that must be considered. Psychologically, the climate must be one of mutual respect (Henschke, 2013b; Knowles, 1985). More often people who felt respected would be open to learning. If not, the learner would be more focused on the lack of respect than on learning. Another characteristic of the psychological climate was creating a climate of collaboration (Henschke, 2013b; Knowles, 1985). A third psychological climate that must be created was that of mutual trust (Henschke, 2013b; Knowles, 1985). People tended to learn more from people they trusted than those that they distrusted (Knowles, 1985). Covey, an American writer about trust, said, “Trust accelerates learning, nothing engages people more than trust” (as cited in Husar, 2014, para. 16). A climate of supportiveness was another characteristic of psychological climate characteristics (Henschke, 2013b; Knowles, 1985). One must recognize that people learned better when they felt supported and not judged or threatened by an environment. A climate of

openness and authenticity was the fifth psychological climate characteristic. This openness and authenticity allowed people to be themselves. Knowles stated that when people were themselves they were, "More likely to be willing to examine new ideas and risk new behaviors" (Knowles, 1985, p. 16). The final two psychological climate characteristics were to create a climate of pleasure and a climate of humanness (Henschke, 2013b; Knowles, 1985). Each one of these psychological climates were important in creating an environment for learning.

The second element of the process design was focusing on involving the learner in mutual planning (Henschke, 2013b; Knowles, 1985). There were many strategies one could use to get learners to engage in mutual planning. People were more committed to any decision they were involved in making. The commitment also was transversely related to the amount of participation. For example, someone who put in a lot of effort in the decision would be deeply committed to the decision, but if they did not participate much in making the decision they would be less motivated (Knowles, 1985).

The next process design element consisted of involving the learners in diagnosing their own learning needs (Henschke, 2013b; Knowles, 1985). There should be a nice balance between the felt needs of the learner and the ascribed needs defined by an organization or culture. Felt needs were needs the learner was aware of (Knowles, 1985). The balance needed to be negotiated between the learner and facilitator.

The last four process design elements were formulating learning objectives, designing learning plans, carrying out learning plans, and lastly evaluating learning (Henschke, 2013b). These process design elements are discussed in more detail under designing learning contracts.

Self-Directed Learning

Self-directed learning in Andragogy had received so much attention and debate over time (Knowles et al., 2012). Self-directed learning was a core staple of andragogy and was what set it apart from pedagogy. The debate was not focused on whether or not adults engage in self-directed learning. It was a conclusion that adults did engage in self-directedness. The real questions were: 1) is self-directed learning a characteristic of adult learners, and 2) should it be the goal of adult educators to help adults become self-directed learners (Knowles et al., 2012). Additionally, there was confusion about the meaning of self-directed learning (Knowles et al., 2012). There were two basic meanings that had surfaced and they were self-teaching and personal autonomy.

The first conceptual meaning of self-directed learning was that of self-teaching (Knowles et al., 2012). This meant that a learner was capable of taking control of the learning and had techniques and mechanisms capable of engaging in this activity (Knowles et al., 2012). On the other hand, self-directed learning could mean a person who had taken on personal autonomy (Knowles et al., 2012). According to Knowles et al. (2012), autonomy meant, "Taking control of the goals and purposes of learning and assuming ownership of learning" (Knowles et al., 2012, p. 171). This allowed the learner to question or challenge everything they had perceived to learn (Knowles et al., 2012). These two meanings were relatively independent of each other, however they may overlap (Knowles et al., 2012). Adults may not have the capacity for self-directed learning in every situation (Knowles et al., 2012). For instance, a systematic review on self-directed learning in health professions conducted by Murad, Coto-Yglesias, Varkey, Prokop, and Murad (2010) found that second year medical students performed better in

self-directed dissection than first year medical students. This showed one instance of the idea that not all adults had self-directed learning capabilities in every situation.

Learners in any particular learning situation were likely to have different capabilities and/or preferences (Grow, 1991). Grow (1991) wrote about four stages in learning autonomy and stated that it was the teacher's responsibility to match styles with the student. The four stages in learning autonomy are listed in Table 11.

Table 11

Grow's Stages of Learning Autonomy

Stage	Student	Teacher	Examples
Stage 1	Dependent	Authority, coach	Coaching with immediate feedback, drill. Informational lecture. Overcoming deficiencies and resistance
Stage 2	Interested	Motivator, guide	Inspiring lecture plus guided discussion. Goal setting and learning strategies.
Stage 3	Involved	Facilitator	Discussion facilitated by teacher who participates as equal. Seminar. Group projects.
Stage 4	Self-directed	Consultant, delegator	Internship, dissertation, individual work or self-directed study group.

It was important to realize that in any learning situation learners would likely be in varying stages. For this reason, the facilitator needed to structure the experience in such

a way that it could accommodate all of these stages (Knowles et al., 2012). These stages could be applied to the continuum of pedagogy and andragogy. Those who were closer to stage 1 would likely succeed in a pedagogical environment while those closer to stage 4 would prefer andragogy.

Self-Directed Learning in the Medical field

The healthcare field was constantly changing and healthcare providers needed to become lifelong learners to keep up with the necessary skills needed to provide quality healthcare to their patients. Self-directed learning had been a method proposed to meet the needs of the healthcare professionals. Several studies had been performed regarding self-directed learning in the medical field in areas such as medical students, doctors, nurses, and other healthcare professionals. A study by Pai, Rao, Punja, and Kamath (2014) studied the effectiveness of self-directed learning in teaching physiology to first-year medical students at Manipal University in India. They studied 237 first year medical students who were divided into two groups. All the students received a self-directed learning session but a group of students also received a one-hour lecture on the topic. Then all the students were given a 10-question test. The researchers found that there were no significant difference in test scores for the two groups (Pai et al., 2014). This signified that self-directed learning was equally effective as traditional lectures and the additional lecture with self-directed learning did not produce better results when combined (Pai et al., 2014). This implied that self-directed learning was an effective way for healthcare providers to learn. Another group of researchers performed a systematic review on the effectiveness or self-directed learning in health professions education (Murad et al., 2010). They performed an analysis on 59 studies that included medical

students, residents, doctors, nurses, and other health professionals. Within the 59 studies there were 8,011 participants. The researchers found several significant results that included: compared with traditional teaching methods, self-directed learning showed a moderate increase within the knowledge domain; learners who were involved with choosing learning resources made larger improvements within the domain of knowledge; and students who were in upper-level classes demonstrated that self-directed learning was superior to traditional methods of teaching. In yet another study, Brydges, Nair, Ma, Shanks, and Hatala (2012) researched directed self-regulated learning versus instructor-regulated learning on participants learning a procedural skill in internal medicine. The participants were postgraduate year one students at the University of British Columbia. This randomized study compared the use of directed self-regulated learning and instructor-regulated learning on a lumbar puncture simulator using easy and difficult models (Brydges et al., 2012). This study concluded that both instructor-regulated learning and directed self-regulated learning improved the student's performance in the skill immediately post performance. However, when performing a post-test three months later, the instructor-regulated learner had a decrease in performance compared to the directed self-regulated learners. This suggested that the directed self-regulated learning allowed for a long-term benefit, which may have shown deeper learning and understanding (Brydges et al., 2012). In this study self-regulated learning was defined as, "A process involving self-generated thoughts, feelings and actions that were planned" and used to obtain a goal (Brydges et al., 2012, p. 649). This definition was similar to self-directed learning and was mentioned by the researchers as such.

Measuring Self-Directedness

Within educational literature two major self-directed readiness scales had been identified. The one that had been most researched was produced by Guglielmino in 1977 known as the Self-Directed Learning Readiness Scale (SDLRS) (as cited in Fisher, King, & Tague, 2001). It had also been commonly called the Learning Preference Assessment (LPA) as a way to not create bias when used in research studies. This scale was designed to measure attitudes, skills, and characteristics that created an individual's ability to manage and direct their own learning. It consisted of 58 items that used a Likert scale of 1 to 5 for scoring. The average score for an adult was 214 indicating that they were more likely to have success in independent learning. Even though they were more likely to be successful they still showed that the learner was uncomfortable with the process. The scoring scale can be seen in Table 12.

Table 12

Self-Directed Learning Readiness

SDLRS A-Score	Readiness for self-directed learning
58-201	Below Average
202-226	Average
227-290	Above Average

Individuals who scored above average had a preference toward self-directed learning. This did not mean that the learner would never choose a structured learning environment such as lecture or traditional courses. For a learner who scored in the below average category it indicated that they would prefer a very structured learning environment. This

would indicate the current level of readiness for self-directed learning and can improve with practice.

The second self-directed readiness scale was developed by Fisher et al. in 2001 and was developed for nursing education (Williams & Brown, 2013). The scale was created in response to the need for a scale that was readily accessible and free of charge (Fisher et al., 2001) since the widely used SDLRS created by Guglielmino could be expensive for researchers. Additionally, there had been issues raised not just over cost, but validity and reliability of the SDLRS instrument created by Guglielmino (Fisher et al., 2001). The self-directed learning readiness scale for nursing education was developed into a 40-item survey and had been used in several health related disciplines (Williams & Brown, 2013). This scale was developed in such a way that nursing content specifics were removed (Williams & Brown, 2013). In developing this scale, the researchers used the Delphi technique because of its wide use in developing research scales (Fisher et al., 2001). The second stage consisted of a pilot study by distributing the scale to a convenience sample of undergraduate students. This pilot study was scored and showed a normal distribution from the sample using a 5-point Likert scale. This led the researchers to conclude that a score of 150 or greater indicated readiness for self-directedness. The resulting scale ended in a 40-item scale that had three subscales that consisted of self-management, desire for learning, and self-control (Fisher et al., 2001). Out of the 40-items, 13 pertained to the subscale self-management, 12 pertained to the desire for learning, and 15 pertained to the subscale self-control (Fisher et al., 2001). In the end it was concluded in this study that the scale appeared to be valid and should be further tested.

A study at the University of Sydney in Australia was performed using participants in a problem based medical program. The goal of the study was to examine the factorial validity to determine the factor structure of the self-directed learning readiness scale for nursing education (Henry & Ginns, 2009). The analysis extracted four components or subscales while the original study performed by Fisher et al. (2001) extracted only three subscales (Henry & Ginns, 2009). These subscales were labeled differently and because of these findings four items within the instrument were excluded (Henry & Ginns, 2009). The now 36-item SDLRSNE did show validity in measuring medical students' readiness to direct their learning (Henry & Ginns, 2009).

Another study used the SDLRSNE to measure undergraduate paramedic students' readiness for self-directed learning (Williams et al., 2013). This study had 259 participants across four Australian Universities. Overall, this study suggested that paramedic students at the four institutions had adequate levels of self-directed readiness (Williams et al., 2013). Interestingly, this study also showed that as student ages increased, so did the overall mean score of the SDLRSNE (Williams, et al., 2013). This supported work done by Smedley, who had previously established a similar finding when studying undergraduate nursing students (Williams, et al., 2013).

Self-Directed Learning in Athletic Training

The use of self-directed learning had been suggested several times in athletic training journals. In 1998, Pitney discussed the idea of using an alternative approach to continuing education for certified athletic trainers. The current state of continuing education was one based on mandatory attendance at conferences, seminars, and workshops and was thought to help create competence in healthcare (Pitney, 1998).

While mandatory continuing education went against the most basic principles of adult education, the idea of life-long learning had merit as healthcare and technology was changing so quickly. This was why Pitney (1998) suggested an alternative approach that included preparing an optimal learning environment, identifying learning needs, allowing learners to set goals, implement specific learning strategies, and evaluating the extent of learning. As a way to help guide self-directed learning a sample-learning plan was offered by Pitney and can be seen in Table 13 (Pitney, 1998). Pitney (1998) wrote that the learner should identify what knowledge or skills would be helpful to meet clinical challenges and place that under learning goals. Learning actions were specific actions that would be initiated in order to acquire specific knowledge or skills identified as learning goals. The evidence portion of the learning contract was identified as what evidence would be demonstrated to prove that goals had been met and learning had taken place?

Table 13

Sample Learning Plan

Learning Goals	Learning Action	Evidence	Resources	Completion Date
Because so many musculoskeletal injuries are the result of cumulative stress, myofascial techniques may improve patient care delivery.	Attend myofascial release workshop and then shadow a master clinician for further instruction.	The learner (employee) will teach a 2-hour hands-on inservice to other certified athletic trainers.	Time off for workshop, money, staff mentor/master clinician to reinforce learning environment upon the learner's return.	Workshop attendance October 12-16. Inservice to be taught December 5.

Resources were the next consideration in the learning plan. Pitney (1998) stated the learning should consider what resources were necessary to implement the learning action and achieve learning goals (i.e., finances, mentors)? Lastly, the completion date should be specified by the learner.

The recommendation was presented as an alternative to current practices as it may have been a more effective strategy for adults than the mandatory set-up. Additionally, this may have helped promote self-directed learning in the allied healthcare field of athletic training (Pitney, 1998). Doherty-Restrepo, Hughes, Del Rossi, and Pitney (2009) reviewed research studies that looked at continuing education effectiveness. Much of their focus was on adult learning theory and lifelong self-directed learning. They argued that the process of continuing education was pedagogical in nature and that the process should reflect an educational format that was conducive to adult learning (Doherty-Restrepo et al., 2009). There was very little evidence to support the standard in athletic training that accumulating continuing education hours resulted in maintaining clinical effectiveness (Doherty-Restrepo et al., 2009). It was recommended that the process become andragogical in nature to promote self-directed learning and learner-centered strategies (Doherty-Restrepo et al., 2009).

Beginning January 1, 2016 through December 31, 2017 the BOC conducted a pilot study titled AT Portfolio Pilot Study that reflected the adult learning process. The pilot study had approximately 530 participants and was started to see if the AT Portfolio was helpful in maintaining athletic trainer competence. As mentioned previously, athletic trainers in 2017 must collect continuing education units that fit within certain categories designated by the BOC and left little room for flexibility of learning. The

BOC spoke about the current system and stated healthcare professions were moving away from collecting continuing education units (CEU's) based on cost and location to one of continuous learning. The continuous learning was based on a system of self-directed learning that included an 11-step process that must be completed in order. The first step was a self-assessment that was five questions long that focused on the last three years of practice as an athletic trainer. The self-assessment was followed by a needs assessment using the PDNA that asked about the domains of athletic training and the tasks in each. The third step was considered an objective assessment where the athletic trainer took a 75-question self-assessment exam that was produced by content writers of the BOC certification exam. The scoring system designated scores below 65% as weak and scores of 85% or higher as strong. A learning needs analysis was the fourth step of the AT Portfolio. The learning needs analysis asked athletic trainers to take steps 1-3 into consideration and answer three questions. The next step was an action plan development module. In the action plan athletic trainers were asked to develop three to five smart goals. For those not familiar with smart goals, the BOC provided a template that focused on statements of "I will", "my", "in", "to" and "by". An example of a smart goal might read like "I will develop my knowledge in recognition and treatment of exertion heat illness to make better clinical decisions by August 1, 2017". Once three to five smart goals were developed, the participant could move on to step 6, acting and recording activities. Step six required the most time commitment as the athletic trainer had to collect 50 CEU without the category restrictions. In addition, the activity ideally would line up with the smart goals, but the continuing education task was not required to. Once the learning occurred the activities were recorded into the AT Portfolio. Step seven

consisted of answering three questions that reflected on the action plan and outcome of the learning activities. Step eight of the AT Portfolio Pilot Study involved performing a needs re-assessment by taking another SAE exam. In step nine the athletic trainer focused on objective re-assessment while step 10 was basic confirmation statements about other requirements such as emergency cardiac care verification. The last step was a summative assessment about the pilot study (Board of Certification Inc., 2015).

Learning Styles

Much research in education had focused on the concept of "learning styles." Many authors had attempted to qualify the idea that teaching to students' learning styles could improve learning outcomes. The concept was simple, instructional methods consistent with identified learning styles would be employed in the classroom therefore improving student-learning outcomes. This concept could also be beneficial to the student. Students who understood their learning preferences could use learning techniques that enhanced their learning (Romanelli, Bird, & Ryan, 2009). Literature had identified several instruments to assess learning styles but two predominately had been used in recent research and include the Visual-Auditory-Kinesthetic (VAK) Learning Styles inventory and the Kolb Learning Styles inventory (Galbraith, 2004; Newton, 2015).

There were three major contributors to experiential learning theory that included John Dewey, Kurt Lewin, and Jean Piaget. Each contributor shared common characteristics that had come to define experiential learning. David Kolb introduced a learning theory known as experiential learning theory (ELT) as a result of his idea that individuals learned through the learner's experiences (Thon & Hansen, 2015). The

experiential learning model was a learning theory that offered an approach to lifelong learning. This learning theory was grounded in social psychology, philosophy, and cognitive psychology (Kolb, 2015) while creating a link between education, work, and personal development where real-world experiences strengthened learning. Kolb (2015) described experiential learning as a method that, "Pictures the workplace as a learning environment that can enhance and supplement formal education" (p. 4). Kolb also described the process as being systematic and cyclical.

Based on ELT, Kolb (2015) suggested that students had learning styles that could be identified through an instrument he created called the Learning Style Inventory (LSI). The LSI development was guided by four objectives that included first constructing a test that people would respond to similar to a learning situation. Second, it was in a self-description format. Third, the creation of an instrument that would prove to be valid. Fourth, it would be a test that would be brief and straight-forward (Kolb, 2015). The final instrument created was a nine-item questionnaire that asked respondents to rank-order four words in a way that best described the respondent's learning style. One word in each item corresponded with one of the four learning modes known as concrete experiences (CE), reflective observation (RO), abstract conceptualization (AC), and active experimentation (AE). The LSI not only measured a person's learning mode but also measured whether the person preferred abstractness to concreteness (AC-CE) and whether they preferred action to reflection (AE-RO) (Kolb, 2015).

The learning modes discussed by Kolb were known as CE, RO, AC, and AE. Concrete experience (CE) learning mode was defined as emphasizing feeling as opposed to thinking. Kolb described individuals with this orientation as, "Someone who values

relating to people and being involved in real situations, and has an open-minded approach to life" (Kolb, 2015, p. 105). Reflective observation (RO) learning mode emphasized understanding as opposed to practical application. People with this orientation were described as people who, "Value patience, impartiality, and considered, thoughtful judgment" (Kolb, 2015, p. 105). Another learning mode discussed by Kolb was abstract conceptualization (AC). Abstract conceptualization was a mode that was oriented toward using logic, ideas, and concepts that emphasized thinking over feeling. People with this orientation valued, "Precision, the rigor and discipline of analyzing ideas, and the aesthetic quality of a neat conceptual system" (Kolb, 2015, p. 105). The last orientation discussed was known as active experimentation (AE) and focused on influencing people and creating change. This orientation had a tendency to use practical application as opposed to reflective understanding. People with this orientation enjoyed getting things accomplished and were good at it (Kolb, 2015).

Learning styles in healthcare education had been a point of research over the years. Nursing, physical therapy, and athletic training education had studied the role of learning styles in education curriculum. In 2015, Thon and Hansen studied preferred learning styles of undergraduate and graduate athletic training students. The study looked at 429 students from CAATE accredited professional undergraduate athletic training programs, and 69 students from CAATE accredited professional graduate athletic training programs. Thon and Hansen used the Marshall and Merritt Student Learning Style Questionnaire (LSQ). The questionnaire was based on Kolb's experiential learning theory. The results showed that the diverger learning style was the preferred learning style of undergraduate and graduate athletic training students. In 2011,

Ristori, Eberman, Tripp, and Kaminski also investigated athletic training student learning styles using a modified version of Kolb's Learning Style Inventory (Ristori, et al., 2011). The study consisted of 23 athletic training students and 13 approved clinical instructors (ACI). A side note, the term ACI was abandoned by the profession and changed to preceptor. The ACI's completed a modified LSI questionnaire designed to obtain their perceptions of athletic training students learning styles. The athletic training students then completed the LSI and compared the results to the ACI's perceptions. The study found that the athletic training students who participated had a divergence learning style. The study also found that ACI's were able to identify the students' learning styles. However, the identification of learning styles by the preceptor was not beneficial to the relationship (Ristori et al., 2011). Other researchers have suggested that athletic training students did not have a preferred learning style.

In a 2002 study by Stradley, Buckley, Kaminski, Horodyski, Fleming, and Janelle, the researchers concluded that undergraduate athletic training students demonstrated a wide range in learning styles. The study had 193 total participants and 188 of those participants completed the LSI. The LSI showed a distribution of learning styles that was considered equal across the four. Of the 188 participants who completed the LSI 29.3% were considered accommodators, 19.7% were divergers, 21.8% were convergers, and 29.3% were assimilators (Stradley et al., 2002, p. S-143). This was not the only study that suggested that athletic training students did not have a preferred learning style or that the learning styles were not consistent across studies.

In 2000, Coker's study suggested that the preferred learning style for athletic training students in the classroom setting was that of assimilators. Meanwhile, the

predominant learning style for the same athletic training students in the clinical setting was that of convergers (Coker, 2000, p. 443). Coker's study had 26 participants who took the LSI two times. While taking the LSI the participants were instructed to think about learning something new in the classroom or the clinical setting. The participants then took the LSI a second time and were asked to think about the other setting. The study showed that ATS learning styles changed based on setting. When comparing this study to the studies mentioned above it was again seen that there was not a consistent learning style for the athletic training student.

While studies had shown that learning styles existed, Newton (2015) performed a database search of the term learning styles in an attempt to understand if and why the myth of learning styles existed. The term learning styles was searched in both PubMed and the ERIC databases. The researcher narrowed the search to include only peer reviewed articles and higher education. Newton found 109 articles that met the inclusion criteria and concluded that learning styles did not work, yet the research literature was full of articles that promoted the use of learning styles (Newton, 2015). Other learning methods may need to be used to maximize student learning if learning styles truly did not exist.

Learning Contracts

In the broadest terms, according to Merriam-Webster dictionary, the word contract is defined as a legal agreement between people, companies, and parties (Contract, n.d.). This seems out of context when thinking about learning contracts in education or the work force. For that reason, some people may refer to learning contracts as learning plans or learning agreements instead of using the word contract. They may

even be called a study plan. Learning contracts in the realm of andragogy are typically a plan that guided self-directed learning. Said another way, "Contract learning is an alternative way of structuring a learning experience" (Knowles, 1986, p. 39). Another definition was provided by Anderson, Boud, and Sampson (1996) as they defined learning contracts as, "A document used to assist in the planning of learning" (p. 15). These contracts usually had several components involved that include: learning objectives, learning resources and strategies, the date of accomplishment, evidence presented to demonstrate the objectives had been met, and how the evidence would be judged or evaluated. If used in an academic setting the learning contract may also include the grade being contracted for (Knowles, 1986, p. 38). It should be noted that learning contracts had been shown to be a great tool for self-directed learning but it should be advised that, "The ability to write contracts is a learned skill, and facilitators must spend considerable time helping students to focus on realistic and manageable activities" (Brookfield, 1986, p. 81).

Learning contracts had been made between the learner and the facilitator, other learners and himself or herself, the learner and the instructor or mentor, or even the learner and a group. The options for which the contract can be made was limitless and could be used in a wide variety of settings. Most commonly, learning contracts were found in higher education (Knowles, 1986, p. 42) but had been used in government agencies, business, and professional development. Healthcare education had been another area where learning contracts had been used and researched. Nursing, for instance, had been seen in the literature frequently associated with learning contracts. Dix and Hughes in 2004 listed learning contracts as a strategy to help adult learners

studying to be nurses. Several researchers had studied using learning contracts in clinical education (Chan & Wai-tong, 2000; Rye, 2008). Chan and Wai-tong in 2000 used an action research approach to study 47 third-year nursing students in Hong Kong. Learning contracts were implemented as the tool of choice. The study had three phases that included design, implementation, and evaluation of the effectiveness of contract learning. The evaluation component was done in two ways. The first evaluation method was by use of the Perceived Benefits of Contract Learning questionnaire developed by Cheng. The second method was by randomly selecting 20% of the students and performing semi-structured interviews. Several themes were identified in the results and broken into benefits and difficulties. The benefits of using learning contracts were: an increase in autonomy, motivation to learn, individualized learning, sharing, and learning effectiveness. Difficulties were also noted and included: limited time in clinical placement, lack of learning contract knowledge, and students' learning attitudes.

Rye (2008) also performed an action research study that investigated the use of learning contracts in respiratory care clinical education. This study consisted of three phases that included planning and contract making, implementing the learning contract, and evaluating the effectiveness of contract learning with 24 senior students in the baccalaureate respiratory care program at the University of Arkansas. After final grades had been submitted, all 24 students were surveyed using a questionnaire modeled after the "Perceived Benefits of Contract Learning questionnaire" developed by Cheng. Of the 24 students surveyed, 21 responded and returned the questionnaire. The results showed that the students had a positive experience with using learning contracts in their clinical rotation. This was evident in the fact that 95% of the respondents agreed that using the

learning contracts during their internship facilitated their ability to apply their knowledge to practice and 100% agreed that the learning contract improved their clinical skills (Rye, 2008, p. 1477).

In yet another example of using learning contracts in healthcare, Ramli, Joseph, and Lee (2013) studied the experiences of Malaysian physiotherapy students and their use of learning contracts and reflective diaries. The study's main focus was to answer, "How the students perceive using clinical education tools such as learning contracts and a reflective diary during their clinical placements" (Ramli et al., 2013, para. 2). The sample studied included 26 final year physiotherapy students who were placed at a government hospital. This was a qualitative study that produced four common themes with learning contracts, while six themes were analyzed in the reflective diaries. The four common themes that were recognized in the learning contracts included: applying theory to practice, improving communication skills, self-development, and adapting to the clinical environment (Ramli et al., 2013, para. 8). These themes were identified as being self-directed by the students just like other learning contract studies. The results also focused on the notion that the learning contracts helped the physiotherapy students improve their skills as a clinician. Overall, the study showed that the learning contracts and reflective diaries were beneficial education tools for physiotherapy students in Malaysia.

Stephenson and Laycock wrote about the educational function of learning contracts in a book titled *Using Learning Contracts in Higher Education*. In that book, the author discussed two main functions of learning contracts. The first function was identified as learning contracts provided a, "Mechanism for managing the great variety of

learning activities negotiated between students and others" (Stephenson & Laycock, 2002, p. 17). The second function was the idea that the processes of developing and completing learning contracts provided valuable learning experiences. Stephenson and Laycock (2002) went on to describe five ways using learning contracts had educational benefits for students. The educational benefits of learning contracts included helping students recognize and clarify the roles of different stakeholders in their learning. Another educational benefit was providing opportunities for students to gain a sense of ownership of their learning. A third educational benefit was raising the quality of students' learning experiences by providing an opportunity for students to clarify learning goals, reflect on learning, and provide input in how performance would be assessed. The fourth educational benefit was that of collaboration. Students were able to collaborate with other students, teachers, or employers on topics directly related to the student's education or jobs. Lastly, helping students develop useful skills and build confidence (Stephenson & Laycock, 2002). Anderson et al. (1996) provided details on learners' experiences of learning contracts. The students perceived both advantages and disadvantages. Perceived advantages included: learning was of interest or relevant to the learner's workplace, the learner was responsible for learning, learning contracts were flexible, the process developed various skills, there was no pressure from grades, motivation was high, learning took place at own pace, and the process reflected individual difference in learning needs (Anderson et al., 1996). Using learning contracts also had perceived disadvantages from students and most of them centered around the lack of familiarity with the process. The disadvantages included: time required for negotiation, difficulty finding a topic, the perception of being isolated, lacking in formal

guidelines, a difficulty in understanding the concept initially, and a need for greater self-discipline. Often, fewer disadvantages were mentioned compared to advantages (Anderson et al., 1996). It was suggested that one way to increase familiarity with learning contracts was to introduce learning contracts in great detail through workshops. Another suggestion was to provide the students with examples of learning contracts for them to review. Lastly, the students suggested that more time be dedicated to working on learning contracts with other students so they could share knowledge gained with each other (Anderson et al., 1996).

Learning contracts were explored in an architectural design studio at the Universiti Kebangsaan Malaysia (UKM) as a way to move architecture students from passive learners to interactive learner (Hassanpour, Che-Ani, Usman, Johar, & Tawil, 2015). The authors wrote that they were prompted to use learning contracts in the architectural design studio because, "Results of other studies in other fields have confirmed the positive impact of learning contract on students' learning needs, confidence, and motivation" (Hassanpour et al., 2015, p. 1). The study participants consisted of 24 second-year architectural students at UKM. During the first week of studio the students and instructors conducted a briefing session to familiarize everyone with learning contracts. Samples were given to all to guide the students' own development of their learning contract. During the initial phase of development, the students were asked to develop their own learning goals. The learning contract consisted of learning objectives, learning strategies and resources, evidence of accomplishment, and means of validating the evidence. The students also stated criteria for assessment and the value of each criterion. Lastly, the learning contracts were reviewed by the

instructors to ensure congruency with course objectives and requirements. These learning contracts closely resembled learning contract designs discussed by Malcolm Knowles. The UKM students in the study had regular discussions about their learning progress as well as participated in a questionnaire and survey. The major findings of the questionnaire used in the study revealed that 60% of the students believed that their interest in the subject and enjoyment of learning increased due to the use of learning contracts (Hassanpour et al., 2015, p. 5). Additionally, 38% of students strongly agreed, and 33% agreed that they learned thoroughly and permanently by using learning contracts (Hassanpour et al., 2015, p. 5). Lastly, Hassanpour et al. (2015) reported 84% of the students agreed that the learning contract increased their responsibility in the subject. Students were also interviewed about their participation in the learning contract study. Students identified several advantages and disadvantages. Advantages reported by the students included increased motivation, individualized learning, and increased learning effectiveness (Hassanpour et al., 2015). In addition, the students asserted that the degree of involved increased as well as a feeling of close communication between themselves and instructors alike. The students also reported disadvantages that included: lack of time, lack of information to arrange the learning contract, and lack of experience and knowledge using learning contracts. It was also noted that students felt anxious and confused as they were worried about correctly writing the learning contract (Hassanpour et al., 2015). Generally speaking, the students were positive about the use of learning contracts and preferred to learn using them compared to conventional methods.

A case study by Bone (2014) looked at using learning contracts to introduce research projects to undergraduate business students at Charles Sturt University (Bone,

2014). The participants were senior business students enrolled in a management class titled *Leadership Issues.* The course was designed to introduce students to the concepts of leadership. The students had never used learning contracts prior to this class and were guided through the process in three stages that occurred early in the semester that left approximately eight to nine weeks to carry out the contract. The stages consisted of: stage one the proposal; stage two that included the learning action, analysis and evaluation, and reflections on learning; and stage three the final report (Bone, 2014, p. 124). Students who participated in the case study had many positive things to say such as, "After I got my head around the concept of a learning contract and setting my own learning guidelines, I really found this subject to be completely relevant to my own personal life and learning" (Bone, 2014, p. 127). Another student stated, "This assessment forced me to go further than most other assessments and thus I feel like I have a deeper understanding of the subject matter and the research process" (Bone, 2014, p. 127). The other participants mentioned similar statements of satisfaction and some offered advice for future students with the main points being, "Start early" and, "This is not an assessment you can do at the last minute" (Bone, 2014, p. 128). Overall, the case study introduced students to a method of learning that promoted active learning and successfully introduced students to the research process. The active learning method was also noted as being capable of transferring over to the workplace.

Higher education was not the only place that learning contracts had been used. In a 2004 case study in London, several acute care London hospitals and the London district general hospitals used learning contracts to effectively manage doctors' poor performance (Lubitsh & Shaw, 2004). The medical directors were concerned about the

traditional methods of dealing with poor performance of their physicians and stated that the processes in place were expensive and created a culture of blame instead of change. The learning contracts aimed to address complex behavioral issues while providing the physicians with a process for development. The learning contract process started by having the medical director identify the behavior problems such as interpersonal difficulties, lack of awareness of behavior, and cross disciplinary communication. The medical director and physician then discussed the appropriateness of the learning contract as it related to the behavioral concern. If both agreed that a learning contract was appropriate then there was a meeting between the medical director, physician, and a clinical psychologist. These meetings were designed to create mutual agreement on goals, tasks, or outcomes. The clinical psychologist's role was to create a supportive environment that encouraged a positive relationship between the medical director and the physician. The next step created a safe environment and began the diagnostic stage. The clinical psychologist created an environment where the physician could speak freely in a confidential manner that would not be shared with their employer. In addition, the diagnostic stage began with a Myers Briggs Type Indicator and a Fundamental Interpersonal Relations Orientation to help gain awareness of preferences at work. To complement the psychological tests a 360-degree feedback process was introduced where the physician received feedback from peers, subordinates, nurses, managers, and administrators. The next step in this case study was the feedback meeting. The doctor received feedback from the psychological tests and worked with the psychologist to identify strengths and areas for improvement. Once this was completed an action plan was created and required the physician to focus on the behaviors back in the workplace.

Step five of the learning contract was implementation and review meetings. The final step was step six, the evaluation of outcomes. In step six, the physician had a comprehensive evaluation that included another 360-degree feedback report that occurred six to 12 months after the baseline. This was compared to the baseline to identify areas of improvement and further desired changes (Lubitsh & Shaw, 2004). Results of this case study were analyzed in a qualitative manner and suggested the learning contract method saved the medical director's time, increased physicians' performance, and prevented costly, difficult disciplinary procedures (Lubitsh & Shaw, 2004). One of the doctors responded, "I have appreciated the fact that the Trust was willing to invest in my personal development through a learning contract instead of applying a disciplinary procedure. It has been a good use of time for everyone involved" (Lubitsh & Shaw, 2004, p. 185)

Designing Learning Contracts

When using and designing learning contracts it was important to know that there was not just one right way. Creating a learning contract was a process between the learner and a helper, mentor, teacher, or peers and was extremely flexible for that reason (Anderson et al., 1996; Galbraith, 2004; Knowles, 1980). Every process could be different based on the needs and desires of the learner (Anderson et al., 1996; Galbraith, 2004; Knowles, 1986, p. 43). Designing a learning contract can be broken into nine steps and include: diagnosing learning needs, specifying learning objectives, specifying learning resources and strategies, completion dates, specifying evidence of accomplishments, specifying how evidence was validated, contract review with peers, carrying out the contract, and evaluating learning (Fedeli, Giampaolo, & Coryell, 2013;

Knowles, 1980). It was not uncommon for the learner to get overwhelmed with designing a learning contract. The contract must be viewed as a means to an end and not the end project (Knowles, 1980).

Diagnosing learning needs was as simple as defining the gap of where the learner was and where the learner wanted to be (Anderson et al., 1996; Knowles, 1980). The learner may have been aware of several gaps in their athletic training education but they may have wanted to take advantage of some of the resources that were available to help diagnose competency deficits. Some of these tools included the BOC self-assessment exams, ACES Preparatory workshop, and the Study Guide for the BOC Exam. In addition to these resources a candidate could reference the 2012 Professional Standards and the 5th edition competencies both listed on the Commission on Accreditation of Athletic Training Education website. Lastly, athletic training students may have wanted to reference the Role Delineation Study/Practice Analysis from the Board of Certification for the athletic trainer website.

Once a learner had diagnosed their learning needs they should have then begun to specify learning objectives. Each one of the learning needs diagnosed in step one should have become a learning objective. These objectives would go in column one "Learning Objectives" of the learning contract and should describe what will be learned (Anderson et al., 1996; Knowles, 1980). An example can be seen in Appendix A.

Step three was all about specifying the learning resources and strategies. This belonged in the second column of the learning contract and was titled "Learning Sources and Strategies." Here it was described how the learner would go about meeting each

objective from column one (Anderson et al., 1996; Knowles, 1980). An example of the learning strategies or tactics can be seen in Appendix A.

Column three of the learning contract incorporated a time component. In this column it should specify the target date of completion (Knowles, 1980). Every learning objective should have a target date of completion and the date did not need to match one another. This column had been implemented as a self-disciplining device to enable scheduling time wisely (Knowles, 1980). An example for the timeline can be seen in Appendix A.

After completing column three, the learner should move over to the next column titled "Evidence of Accomplishment of Objectives". This was the fifth step in the process of creating a learning contract. In this step the learner should be focused on the evidence needed to "prove" each objective had been achieved (Anderson et al., 1996; Knowles, 1980). An example of evidence can be seen in Appendix A.

Criteria and means for validating evidence belong in the next column (Anderson et al, 1996; Knowles, 1980). Again this should be done for every learning objective the learner had defined. First, it specified the criteria the evidence would be judged on. The criteria would be different for each type of learning objective (Knowles, 1980). Then the participants determined the means by which the evidence would be judged (Knowles, 1980). This was an important step in the process. Knowles stated, "One of the actions that helps to differentiate distinguished from adequate performance in self-directed learning is the wisdom with which a learner selects his or her validators" (Anderson et al., 1996; Knowles et al., 2012, p. 216). An example of validation criterion can be seen in Appendix A.

With steps one through six completed, the learner would want to have the drafted learning contract reviewed. Friends, supervisors, professors, or content experts could review the learning contract draft (Anderson et al., 1996; Knowles, 1980). The reviewer or reviewers would want to provide feedback and may want to consider asking questions to themselves such as: are the learning objectives clear and realistic, do the learning strategies seem reasonable and appropriate, and are the means for validating the evidence clear and convincing.

Step eight was the act of carrying out the learning contract. As the learner worked through the learning contract they should remain aware that they might run into different thoughts or notions that may change. It was acceptable to make changes to the learning contract, as the learner's needs changed (Anderson et al., 1996; Knowles, 1980).

The final step was evaluating learning once the learner had completed the learning contract. Depending on the setting of the learning contract, the learner could have the same person or people from step six give assurance of learning. In a classroom setting it would likely be the class professor (Anderson et al., 1996; Knowles, 1980). An example of learning contracts can be found in both Appendix A and Appendix B.

Summary

Athletic Training relatively speaking, was a young profession that had encountered tremendous change during the past few years prior to this writing. These changes created an older student who brought more life experiences into the classroom. In addition to more experience the learners had brought a self-directed learning mentality to the classroom that may not have been appropriate for a pedagogical approach. Instead, the learners had been seen as adults who could thrive in an andragogical approach. In the

andragogical approach the use of learning contracts provided a tool to promote desired self-directed learning. Research based on the use of learning contracts had been conducted in educational and non-educational environments providing an insight into advantages and disadvantages using learning contracts.

Chapter Three: Methodology

Introduction

The purpose of this study was to explore the application of learning contracts in preparation for the athletic training certification examination. The goal of this study was to provide information that would contribute to student and institutional success on first time pass rates of the BOC examination. The researcher used a mixed methods study to gather a more complete understanding of the research problem. According to Fraenkel, Wallen, and Hyun (2015), using qualitative and quantitative methods in a single research study allowed the researcher to gain a more complete understanding of the research problem than did using either method alone. Qualitative data collected in this study focused on the development, application, and perceived usefulness of learning contracts while preparing for the BOC certification examination. Quantitative data collected focused on perceived self-directed readiness, usefulness of learning contracts, BOC Self-Assessment examination scores, and the BOC certification examination.

Theoretical Framework

The framework of this study was based on the adult learning theory called andragogy. Andragogy in short was an adult learning theory that focused on the idea that adults were self-directed learners. The assumption that adult learners had a need to be self-directed was one that Knowles (1986) described as a must have skill in order to be a lifelong learner. Self-directed learning had been defined as, “Taking control of the goals and purposes of learning and assuming ownership of learning” (Knowles et al., 2012, p. 171). In the healthcare field it had been recognized that healthcare professions needed to be responsible for their own learning to keep up with continuing education needs. Thus,

the researcher used this framework to research self-directness in studying for the BOC examination. Figure 2 is a model of self-directed learning known as the Garrison Model (Merriam et al., 2007).

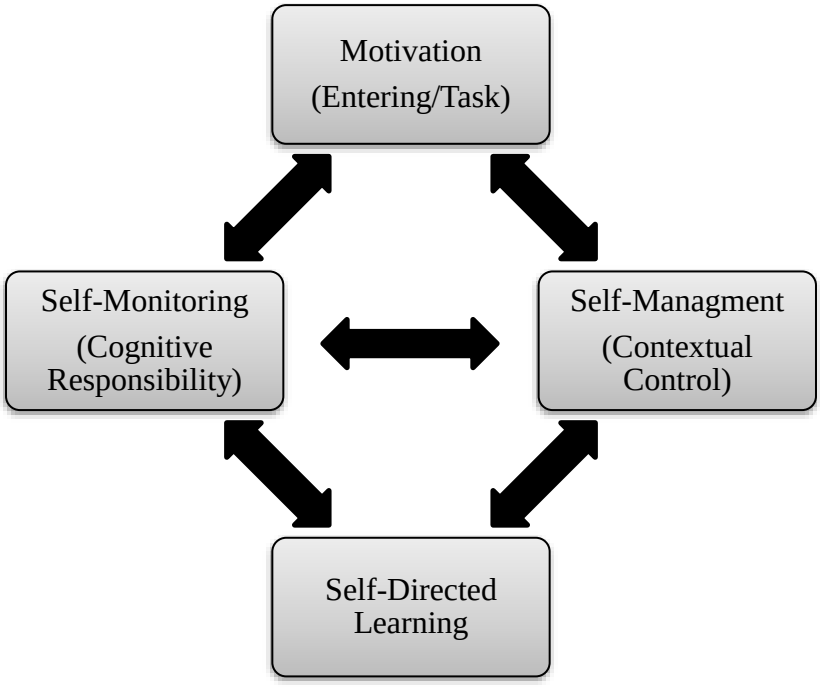

Figure 2. Dimensions of self-directed learning, Garrison's model.

The Garrison model was one of three non-linear interactive models proposed. Garrison's model was the most recent proposed multidimensional model and was grounded in the collaborative constructivist perspective (Merriam et al., 2007). This model looked at the dimensions of motivation, self-monitoring, and self-management as a way to approach self-directed learning (Merriam et al., 2007). However, a more linear approach proposed by Tough (1971) and Knowles (1975) was used in this research study. The process of using learning contracts to guide direct learning was the framework to the linear approach of self-directed learning suggested by Knowles.

Rationale

The rationale for this study focused on the need to find best practices to assist students in being successful when taking the BOC certification examination following completion of their Athletic Training degree program or in their last semester of completion. In 2017, there was little information in the research literature describing effective teaching strategies that could guarantee first-time passing rates on the BOC examination. Additionally, the NATA Research and Education Foundation was looking for answers to the following question: "What are efficient and effective education methods (model practices) in AT education?" This research contributed to the body of knowledge related to adult learning strategies, self-directed learning and the application of learning contracts.

Research Question and Null Hypotheses

Following a comprehensive review of the literature, the researcher identified that the use of learning contracts to promote self-directed learning had been studied in other healthcare professions but little information was available for learning contract use in athletic training. Additionally, the researcher recognized that athletic training lacked best practice research on preparation techniques used for BOC examination success. The research question was designed to address these concerns and focused on the following research question: What is the relationship between the use of learning contracts and successful preparation for the BOC as measured by passing rates on the BOC exam?

The study also focused on six research null hypotheses:

NH1: There is no difference in scores for Exam Preparedness, when viewing students who use learning contracts and SAEs compared to students who use SAEs without a learning contract.

NH2: There is no difference in scores for Self-Directed Learning Readiness when viewing students who use learning contracts and SAEs compared to students who use SAEs without a learning contract.

NH3: There is no difference in first-time pass rates on the BOC examination, when viewing students who use learning contracts and SAEs compared to students who use SAEs without a learning contract.

NH4: There is no difference in first-time pass rates on the BOC examination, when comparing the three-year national average passing rates to the pass rates of students who used learning contracts and SAEs or the SAE only group.

NH5: There is no difference in scores for Self-Assessment Examinations and BOC Scores when comparing students who use learning contracts and students who choose not to.

NH6: There is no relationship of Grade Point Average to success on the BOC examination regardless of participation in SAEs or a student-self-developed learning contract.

Study Population

The population of this study was limited to senior undergraduate athletic training students who planned to take the BOC examination in the spring of 2017. More specifically, the senior athletic training students attended colleges or universities in Illinois and Missouri. These colleges or universities were further narrowed by distance

from the researcher. Each school was within 4.5 hours of driving time from the researcher. The researcher emailed the Athletic Training program directors of the participating schools. The program directors were asked to share a participant recruiting letter with their senior athletic training students. Participants self-selected by emailing the researcher that they would like to participate in the research study and met the criteria of being a senior athletic training student taking the BOC exam in the spring of 2017. Participants volunteering for the study were able to self-select to the learning contract group (experimental) or the non-learning contract group (control). The experimental group consisted of 29 participants who attended a seminar group session on effective learning contracts. The average age of participants in the experimental group was 22.14 with a standard deviation of 1.83 years. The experimental group participants were from three different universities. The participant's ages ranged from 21-29 years old. Of the 29 participants, 17 participants (58.62%) were female and 12 participants (41.38%) were male. These percentage breakdowns of female to male participants were similar to the student enrollment profile for CAATE accredited athletic training programs during the 2014-2015 school year and can be seen in Figure 3 (CAATE, 2015a, p. 13).

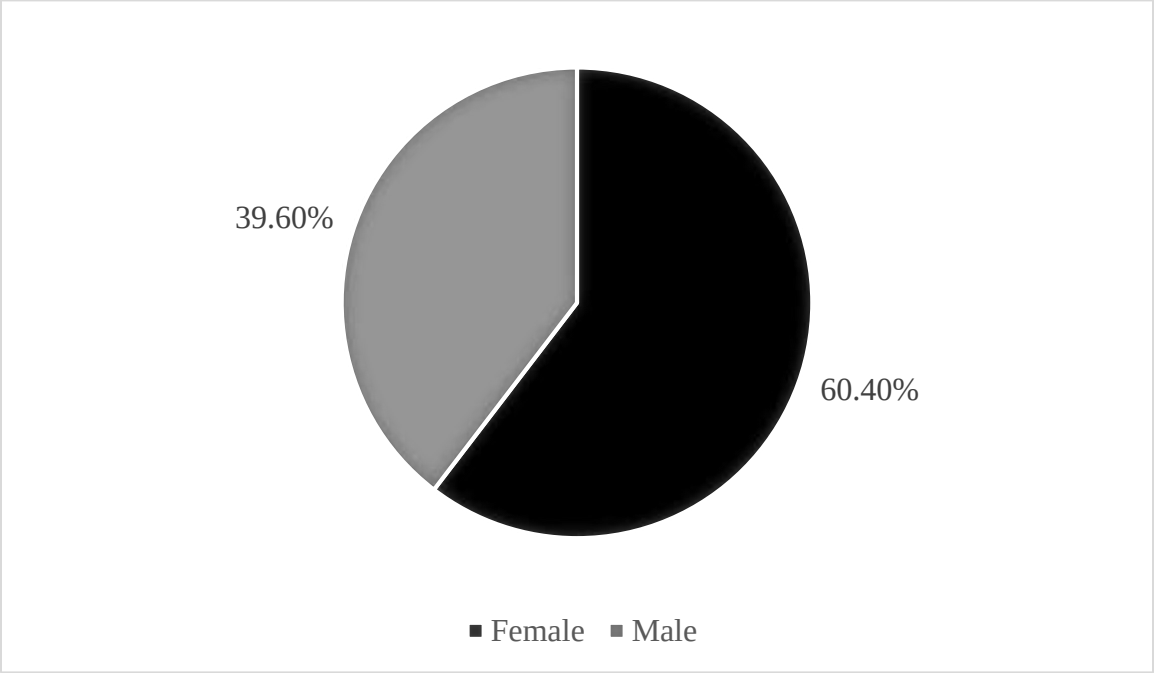

Figure 3. Enrollment by sex in CAATE accredited programs 2014-2015.

The control group consisted of 30 senior athletic training students who took the BOC exam in the spring of 2017. These participants volunteered from 10 different universities and ranged in age from 21-29 years of age. The 30 participants consisted of 20 females (66.67%) and 10 males (33.33%) with a mean age of 21.67 years of age and a standard deviation of 1.47 years.

Relationship to Participants

The principal investigator was a faculty member at Lindenwood University and taught within the Lindenwood University CAATE accredited athletic training program. Participants in this study included senior athletic training students from CAATE accredited athletic training programs in Illinois and Missouri. Some of the participants were Lindenwood University senior athletic training students who took the BOC exam in the spring of 2017.

Research Setting

The research took place at a variety of settings in the states of Illinois and Missouri. The learning contract group participated in a workshop at one of two local universities. The learning contract participants did not have to attend both workshops as they were identical but were required to attend one. The participants took the surveys and SAE's in undisclosed locations. The participants however were affiliated with a CAATE accredited undergraduate athletic training program at a university in Illinois or Missouri. The participants also took the BOC exam that was administered at an approved Castle Inc. testing site that could have been anywhere in the United States. Lastly, a focus group met at Lindenwood University in St. Charles, Missouri to discuss participation in the study.

Research Instrumentation

The framework of this study focused on self-directed learning of senior athletic training students and the use of learning contracts to prepare for the BOC examination. Several scales had been developed and used in research to measure self-directedness of students. The self-directed learning readiness scale for nursing education (SDLRSNE) used in this study was developed by Fisher et al. in 2001 as a tool to measure self-directed learning readiness of nursing students and can be seen in Appendix C (Fisher et al., 2001). Permission was obtained to use the scale and can be found seen in Appendix D. The SDLRSNE was a 40-item survey distributed across three factors. The factors were self-management, desire for learning, and self-control (Fisher & King, 2010). The survey used a five-point Likert scale where one indicated strongly disagree and five indicated strongly agree. Anyone scoring 150 or above on the SDLRSNE was said to be

ready for self-directed learning (Fisher et al., 2001, p. 520). To prevent responder bias, the scale rephrased four items into negatively worded items. This required the scoring scale to be reversed on these questions. Participants were asked to answer each item based on how each item reflected their own characteristics. The SDLSNE had the nursing specific content removed to allow the scale to be used by other professions (Williams & Brown, 2013). In a study in 2010, Fisher and King validated the scale but recommended that further investigation occur regarding the factor validity. Overall scale reliability for the 40-item Self-Directed Learning Readiness Scale was .907 which is in line with past uses of the research instrument (Fisher & King, 2010; Fisher et al., 2001).

Another instrument used in this research study was learning contracts. Knowles wrote about designing learning contracts in 1980 and broke the process down into nine steps. These steps included: diagnosing learning needs, specifying learning objectives, specifying learning resources and strategies, completion dates, specifying evidence of accomplishments, specifying how evidence is validated, contract review with peers, carrying out the contract, and evaluating learning (Knowles, 1980). These steps were incorporated into the participant's design of their own learning contracts. An example of a learning contract can be seen in Appendix A as well as a research participant's learning contract in Appendix B. Learning contracts had been used in other healthcare professions as an instrument that promoted self-directed learning. In 2000, Chan and Wai-tong studied nursing students use of learning contracts and found benefits of using learning contracts were an increase in autonomy, motivation to learn, individualized learning, sharing, and learning effectiveness (Chan & Wai-tong, 2000).

Table 14

Reliability Analysis for Self-Directed Learning Survey

Question	Item-Total Correlation	Alpha if Item Deleted
I solve problems using a plan.	.379	.906
I prioritize my work.	.428	.905
I do not manage my time well.	.363	.907
I have good management skills.	.350	.906
I set strict time-frames.	.460	.905
I prefer to plan my own learning.	.448	.905
I am systematic in my learning.	.492	.904
I am able to focus on a problem.	.395	.906
I need to know why.	.401	.905
I critically evaluate new ideas.	.342	.906
I prefer to set my own learning goals.	.559	.903
I learn from my mistakes.	.318	.906
I am open to new ideas.	.338	.906
When presented with a problem I cannot resolve, I will ask for assistance.	.249	.907
I am responsible.	.609	.903
I like to evaluate what I do.	.437	.905
I have high personal expectations.	.615	.903
I have high personal standards.	.609	.904
I have high beliefs in my abilities.	.483	.904
I am aware of my own limitations.	.266	.907

Table 14 continued.

I am confident in my ability to search out information.	.455	.905
I do not enjoy studying.	.324	.908
I have a need to learn.	.325	.906
I enjoy a challenge.	.607	.903
I want to learn new information.	.611	.904
I enjoy learning new information.	.437	.905
I set specific times for my study.	.479	.905
I am self-disciplined.	.584	.903
I like to gather the facts before I make a decision.	.535	.904
I am disorganized.	.481	.904
I am logical.	.414	.905
I am methodical.	.541	.904
I evaluate my own performance.	.404	.905
I prefer to set my own criteria on which to evaluate my performance.	.280	.907
I am responsible for my own decisions/actions.	.203	.907
I can be trusted to pursue my own learning.	.661	.902
I can find out information for myself.	.537	.904
I like to make decisions for myself.	.424	.905
I prefer to set my own goals.	.372	.906
I am not in control of my life.	.221	.909

Once the learner implemented the learning contract, the researcher explored the benefits of the learning contract by using a modified version of the Perceived Benefits of

Contract Learning questionnaire developed by Cheng in 1997. This instrument is included in Appendix E. The perceived benefits of contract learning questionnaire were 22 questions that were divided into four sub-scales. The subscales were the ability to use learning contracts, effects on student autonomy in learning, effects on student motivation in learning, and effects on applying theory to practice (Chan & Wai-tong, 2000). In the original questionnaire, students were asked to rate each item on a five-point Likert scale from one to five (1 = strongly agree to 5 = strongly disagree). The researcher used the one to five scoring scale but reversed it (1 = strongly disagree to 5 = strongly agree). The purpose of reversing the scoring was to align a higher score to the more favorable response.

Self-assessment exams were used as another research instrument. This instrument was a 75-question test that represented the type of questions and content on the BOC exam. There were several different types of questions that included multiple-choice, multi-select, drag-and-drop, hot spot, and focused testlets. Content experts who were responsible for developing the BOC exam also wrote the SAE exam questions. The SAE questions would never appear on the BOC exam even though the BOC content experts wrote the questions. The goals of the SAE were to assist in determining potential domain strengths and weaknesses by providing brief diagnostic information such as percentage correct for each domain. Sample SAE questions can be found in Appendix F and a sample of the results page can be seen in Appendix G.

The BOC examination was the final research instrument. The BOC exam consisted of 175 questions that included scored and experimental questions that were not scored. The exam was a computer-based exam that was scored by a professional testing

service known as Castle. Candidates had a maximum of 4 hours to complete the exam and needed to score 500 out of 800 to receive a passing score. The questions on the BOC exam were written by content experts and consisted of the following types of questions: multiple choice, multi select, drag and drop, hot spot, and focused testlets. Focused testlets have been defined as, "A 5-item focused testlet consisting of a scenario followed by 5 key/critical questions related to that scenario. The questions can include any of the previously described item types" (Board of Certification, 2017, p. 21). The content experts based their questions on what had been defined as current entry-level knowledge, skills, and abilities that were required for certified athletic trainers. The Practice Analysis, 7th Edition, had defined this content. The point value of each question was determined by a weight assigned to each domain as well as the number of questions in the content category (Board of Certification, 2017). Table 15 shows the weight of each domain by displaying the percentage of questions in each domain that was on the exam.

Table 15

Practice Analysis, 7th Edition BOC Exam Content

Domains for Exam Questions	% of Questions on Exam
Injury and Illness Prevention and Wellness Promotion	19.8%
Examination, Assessment and Diagnosis	24.3%
Immediate and Emergency Care	15.5%
Therapeutic Intervention	27.4%
Healthcare Administration and Professional Responsibility	13.0%

Domain four, Therapeutic Interventions had the most content with just over 27% of the questions relating to that domain. Domain two, Examination, Assessment and Diagnosis was a close second making up 24.3% of the questions.

As mentioned above, the vast majority of participants took the BOC exam based on Practice Analysis, 7th Edition. However, five participants took the January – February 2017 BOC exam. This examination was based on Practice Analysis, 6th Edition and was in effect from April 2011 through the February 2017 BOC exam. Table 16 shows the weight of each domain for the participants who took the BOC exam during the January – February window (Johnson, 2010).

Table 16

Practice Analysis, 6th Edition BOC Exam Content

Domains for Exam Questions	% of Questions on Exam
Injury and Illness Prevention and Wellness Protection	25%
Clinical Evaluation and Diagnosis	22%
Immediate and Emergency Care	19%
Treatment and Rehabilitation	22%
Organizational and Professional Health and Well-Being	12%

Threats to Internal Validity

Table 17 provided data that summarized the threats to valid inference. All of the threat tests were conducted and controlled as well as possible. Table 17 represented a complete listing of the threats to internal validity assessed.

Table 17

Threats to Internal Validity

Threats	Controlled	Explanation
History	No	Participants may have been exposed to Learning Contracts in academic training
Maturation	Yes	Respondents were all seniors in the process of graduation
Testing	Partially	Study participants were asked to self-report answers to questions
Instrumentation	Yes	Same survey tool was used with all participants and schools
Statistical Regression	Yes	All participants were athletic students within an AT program
Selection Bias	No	Participants were invited by convenience sample method to be a part of the study
Morality	Partially	Study participants were invited but not forced to complete surveys
Casual Time Order	Yes	Data was collected within timely data collection window as defined by research proposal
Diffusion	No	Participants were all Athletic Trainers or students seeking AT certification through NATABOC
Demoralization	Yes	Participants did not experience any negative treatment or treated unfairly

Table 17 continued.

Compensatory Rivalry	No	Not relevant to the study
Compensation	Yes	Neither group was provided compensation for participation

Time Line

Participant recruitment began on September 1, 2016. This was the beginning of the fall semester for many colleges and universities. The researcher emailed undergraduate athletic training program directors and asked for their help in recruiting participants. The program directors then contacted their students to inform them about the research study and how to volunteer to participate if they wished. The senior athletic training students who volunteered to participate self-selected the group they wanted to participate in. The groups consisted of the experimental group who participated in a workshop on learning contracts, took a self-assessment exam (SAE), and participated in a questionnaire. The control group participated in SAE's and questionnaires only. The experimental group participated in a workshop in October of 2016. The workshop was three to four hours in length. At the conclusion of the workshop, all students completed a comprehensive learning contract to use as a self-directed study instrument in preparation to take the BOC examination. The control group was sent a voucher code to take a SAE during the fall 2016 semester. The students took the SAEs before the end of the fall semester. In January 2017, all the participants were emailed another voucher code for them to take another SAE exam. The participants were reminded which SAE they took first and were instructed to take a different SAE. Prior to the participant taking the BOC

exam the participant completed the second SAE regardless of the group they participated in. The BOC exam dates fell in three windows that included January 28th – February 11th, March 25th – April 8th, and May 27th – June 10th. The experimental group also took a survey called Perceived Benefits of Contract Learning during the spring semester before they took the BOC exam. A focus group of five students met May 3, 2017 to discuss the use of the learning contract.

Data Collection

Senior athletic training students were invited to participate in a fall workshop on BOC exam preparation (See Appendix H for example of invitation letter). Students who participated in this workshop had the opportunity to take a SAE provided by the BOC, Inc. free of charge and participated in a seminar on learning contracts (See Appendix I for BOC approval letter). Quantitative data was collected from obtaining a copy of the participants' SAE. At the conclusion of the workshop, students submitted a copy of their personalized learning contract to the researcher. Each student also retained a copy of his or her respective learning contract. This qualitative data was translated for common themes by using a process known as coding. Coding had been defined as the analytical process through which data was broken down to form a theory (Fraenkel et al., 2015). Additionally, participants in the workshop group (experimental group) completed a paper questionnaire used to measure their current level of self-directed learning readiness and were collected at the beginning of the workshop.

The majority of the remaining data was collected electronically and participants were recruited via email (see Appendix J for example of invitation letter). The control group completed the self-directed learning readiness scale through a survey program

called Qualtrics. These participants were then sent an email with a BOC voucher code that gave them access to a SAE. Once the participants completed the SAE the participant emailed the researcher a pdf copy of the results page.

The experimental group was emailed a modified version of the perceived benefits of contract learning questionnaire in January 2017. The questionnaire was developed in Google forms and a link was emailed to the participants. This survey tool allowed the participants to take the questionnaire and submit the results directly to the researcher.

In early January 2017, the researcher emailed all study participants another BOC voucher. The emailed asked the participants not to take the exact same SAE they took in the fall of 2016 as the BOC had four versions available. In the same email the researcher reminded the participant which SAE they took in the fall semester. All study participants took a SAE in the spring of 2017 prior to taking the BOC examination. All the participants emailed the researcher a pdf copy of the results page.

Another data point collected via email from the participants was BOC examination scores that the participant received from their program administrator through the CAATE e-accreditation website. The students did not have access to their scores so they had to ask a program administrator to look on the CAATE e-accreditation website. Along with the scores the participant reported to the researcher through email that they passed or failed the BOC examination.

The researcher also performed focus group interviews with volunteer participants in May of 2017. The focus group consisted of five participants from the experimental group. The researcher audio recorded the interview session then transcribed the data. The transcription was then coded into common themes.

Data Analysis Procedures

Data was analyzed using Statistical Package for the Social Sciences (23.0). In order to address the research hypothesis, a series of comparative independent sample *t*-tests were used to determine whether differences existed between groups. The comparison groups included 29 students who participated in the Learning Contract training program and 31 students who self-selected to a control group. Data was captured through a number of self-report surveys and then exported into an SPSS 23.0 (Statistical Package for the Social Sciences) file. The file was data cleaned using a basic frequency analysis. After running a descriptive statistics analysis for general categorical data, a series of independent samples *t*-tests were run for the purpose of answering the three null hypotheses. For the Exam Preparedness Survey, measuring "perceptions of exam readiness," a seven-point Likert scale was used. This allowed a series of independent *t*-tests to be calculated in order to compare mean scores for both the experimental 'learning contract' group and a self-selected control group. For the Self-Directed Learning Survey, measuring the extent to which a student was self-motivated to learn, a five-point Likert scale was utilized. A series of independent sample *t*-tests were run to determine whether any statistically significant differences were to be found between the two groups. A correlational analysis was run to determine whether a significant relationship existed between scores on the BOC examination and college grade point average. Finally, a reliability analysis was conducted for both the Exam Preparedness Scale and the Self-Directed Learning Readiness Scale.

Summary

This was an exploratory study examining the utility of learning contracts as a self-directed learning tool suitable for assisting students achieve success on the BOC certification examination. All of the subjects completed the "Exam Preparedness Survey" and the "Self-Directed Learning Survey." Students also were able to complete two "Self-Administered Evaluations" (SAEs) which were designed as personal assessment tools for prospective examination candidates. The control group participated only in the SAEs part of the study, whereas the experimental group was exposed to a learning-contract education session in the months prior to taking the certification examination. The hypotheses tested was that students who participated in the learning contract training and implementation were more likely to experience higher first-time pass rates than a peer group who did not.

Higher numbers on the Likert-scale survey questions (Exam Preparedness Survey and Self-Directed Learning Survey) were indicative of agreement with the question at hand; lower numbers represented disagreement to the question at hand. The outcomes of this study were designed to determine if using learning contracts as a self-directed learning tool significantly increased the chance of athletic training students passing the BOC examination at the first attempt. There was a need for investigation in to what self-directed learning strategies are most useful in assisting student athletic trainers in passing the BOC examination. First-time pass rates also had a significant impact on whether a school could maintain their accreditation through CAATE. The intent of this study was to make recommendations regarding the further use of various self-directed learning tools with an emphasis on structured learning contracts.

Chapter Four: Results

Introduction

The following section presents the results of the data analysis on the impact of utilizing learning contracts as a self-directed learning tool designed to assist students with successful completion of the BOC examination. Data was captured through a number of self-report surveys and then exported into an SPSS 23.0 (Statistical Package for the Social Sciences) file. The file was data cleaned using a basic frequency analysis. After running a descriptive statistics analysis for general categorical data, a series of independent samples *t*-tests were run for the purpose of answering the three null hypotheses. For the Exam Preparedness Survey (see Appendix K), measuring "perceptions of exam readiness," a seven-point Likert scale was used. This allowed a series of independent *t*-tests to be calculated in order to compare mean scores for both the experimental 'learning contract' group and a self-selected control group. For the Self-Directed Learning Survey, measuring the extent to which a student was self-motivated to learn, a five-point Likert scale was utilized. A series of independent sample *t*-tests were run to determine whether any statistically significant differences were to be found between the two groups.

Analysis

The analysis is presented in sequential format following each null hypothesis. Qualitative data were coded into themes using an EXCEL format. The themes that emerged from analyzing the data included: diagnosis of learning needs, organization, and planning.

Table 18

Frequency Analysis for Select Group Variables

Variable	Frequency	Percent	3-Year BOC Pass Rate %
School Affiliation			
Contract Experimental Group			
Lindenwood University	13	44.8*	80.0
McKendree University	11	37.9	42.0
Lindenwood Belleville	4	13.8*	80.0
University of Missouri	1	3.4	91.0
Non-Contract Control Group			
Milliken University	8	25.8	71.0
University of Missouri	6	19.4	91.0
North Central University	6	19.4	90.0
William Woods University	3	9.7	18.0
Lindenwood University	2	6.5	80.0
Western Illinois University	2	6.5	85.0
Central Methodist University	1	3.2	75.0
Culver Stockton College	1	3.2	61.0
Missouri Valley College	1	3.2	71.0
Northern Illinois University	1	3.2	68.0
Participating BOC Test-Taking Dates			
Contract Experimental Group			
April 2017	13	44.8	
March 2017	8	27.6	
May 2017	3	10.3	
January 2017	3	10.3	
May 2017	2	6.9	
Non-Contract Control Group			
March 2017	19	61.3	
May 2017	7	22.6	
January 2017	5	16.1	

Table 18 shows the frequency distribution for colleges represented in the study and the corresponding test dates chosen by the students participating in the study. The average age of students in the experimental group was 22.14 with a standard deviation of 1.82. The average age of students in the control group was 21.68 with a standard deviation of 1.45. Average Grade Point Average (GPA) scores for students were 3.52 for the experimental group and 3.36 for the control group. *It must be noted that Lindenwood University and Lindenwood University-Belleville are a single program across two campuses therefore, the pass rates are not reported separately by CAATE.

NH1: There is no difference in scores for Exam Preparedness, when viewing students who use learning contracts and SAEs compared to students who use SAEs without a learning contract.

Table 19

Descriptive Statistics Analysis for Exam Preparedness Survey Questions

Questions	Contract Grp.		Control Grp.	
	$\bar{x}$	s	$\bar{x}$	s
I consider myself well-prepared to pass the BOC exam.	3.62	1.08	4.26	1.48
I am confident in my ability to pass the BOC exam.	4.79	1.43	4.65	1.78
Participation in clinical experiences have prepared me to pass the BOC exam.	5.21	.98	5.45	1.17
Interactions with preceptors have prepared me to pass the BOC exam.	5.17	.85	5.65	1.05
Traditional lectures have prepared me to pass the BOC exam.	4.66	1.34	5.35	1.14
Engagement in hands-on lab experiences have prepared me to pass the BOC exam.	5.28	1.00	6.07	.73
Senior capstone experience or oral practical has prepared me to pass the BOC exam.	5.14	1.19	4.94	1.18
Learning contracts are an effective tool in helping to prepare for the BOC exam.	4.90	.98	4.61	.88
Self-assessment exams are an effective tool in helping to prepare for the BOC exam.	5.62	.78	5.87	.96
Study guides are an effective tool in preparing for the BOC exam.	6.17	.80	6.32	.54
Attending workshops and seminars are an effective tool in preparing for the BOC exam.	5.90	.98	5.39	1.20

Table 19 continued.

Self-directed learning is important in preparing for the BOC exam.	5.79	.98	5.55	.99
Teacher-directed learning is important in preparing for the BOC exam.	5.83	.93	6.03	.66
I am highly motivated to pass the BOC exam.	6.62	.73	6.45	1.09
I plan on pursuing a career in the field of Athletic Training.	5.76	1.70	5.97	1.60
I believe I have the practical knowledge required to pass the BOC exam.	5.62	.98	5.87	.88
I believe I have the theoretical knowledge required to pass the BOC exam.	5.38	.98	5.45	1.03
My academic performance in the class-room has prepared me to pass the BOC exam.	5.38	.86	5.52	1.09
I believe I will pass the BOC examination at the first attempt.	5.83	.89	5.16	1.57
I am committed to studying hard to pass the BOC exam.	6.48	.91	6.39	.80

Table 20

Independent Samples T-Test for Exam Preparedness Survey Questions Comparing Contract Group versus Non-Contract Control Group

Question	t	df	Sig.
Traditional lectures have prepared me to pass the BOC exam.	-2.178	58	.033*
Engagement in hands-on lab experiences have prepared me to pass the BOC exam.	-3.518	58	.001***
I believe I will pass the BOC examination at the first attempt.	2.001	58	.050*

*p<.05; **p<.01; ***p<.001

Of the 20 questions asked on the Exam Preparedness Survey, three of them suggested a statistically significant difference between the two groups. Questions five and six related to perceptions of traditional lectures and hands-on experiences preparing the student well to pass the BOC showed significantly higher scores for the non-contract group. Conversely, overall belief in the ability to pass the BOC examination at the first attempt was scored higher for the contract group (Mean of 5.83) when compared to the control group (Mean of 5.16). Scores for these questions were relatively similar for both groups. This suggested a similarity in how students perceived their competence and preparedness to take the BOC certification exam. A notable question was question one on the survey that asked, "I consider myself well prepared to pass the BOC exam." Both groups scored the lowest for this question out of the 20 questions on the scale (Contract Group = 3.62; Control Group = 4.26). The final two questions on the Self-Preparedness Survey were 10-point rating scale items. On a scale of 1 to 10, participants were asked to rate (1) their commitment to Athletic Training, (Contract Group = 8.73; Control Group = 8.55) and (2) their commitment to self-directed learning (Contract Group = 7.93; Control Group = 7.48). No statistically significant differences were found between the two groups for these two items therefore the researcher failed to reject the null hypothesis.

NH2: There is no difference in scores for Self-Directed Learning Readiness when viewing students who use learning contracts and SAEs compared to students who use SAEs without a learning contract.

Table 21

Descriptive Statistics Analysis for Self-Directed Learning Readiness Scale Questions

Questions	Contract Grp.		Control Grp.	
	$\bar{x}$	s	$\bar{x}$	s
I solve problems using a plan.	3.86	.79	4.10	.54
I prioritize my work.	4.38	.76	4.77	.43
I do not manage my time well.	3.52	1.12	3.84	1.04
I have good management skills.	4.07	.84	4.16	.58
I set strict time-frames.	3.35	.86	3.42	.96
I prefer to plan my own learning.	3.41	.95	3.26	.99
I am systematic in my learning.	3.52	.83	3.97	.80
I am able to focus on a problem.	4.03	.73	4.32	.70
I need to know why.	4.14	.79	4.55	.62
I critically evaluate new ideas.	3.90	.67	4.00	.73
I prefer to set my own learning goals.	3.66	.77	4.00	.73
I learn from my mistakes.	4.59	.57	4.84	.37
I am open to new ideas.	4.48	.63	4.77	.49
When presented with a problem I cannot resolve, I will ask for assistance.	4.62	.56	4.48	.68
I am responsible.	4.62	.56	4.68	.65
I like to evaluate what I do.	4.17	.60	4.32	.75
I have high personal expectations.	4.62	.49	4.55	.72

Table 21 continued.

I have high personal standards.	4.62	.49	4.74	.63
I have high beliefs in my abilities.	4.28	.75	4.19	.83
I am aware of my own limitations.	4.10	.62	4.39	.49
I am confident in my ability to search out information.	3.90	.77	4.48	.63
I do not enjoy studying.	2.79	1.15	2.84	1.21
I have a need to learn.	4.14	.74	4.16	.82
I enjoy a challenge.	4.38	.76	4.29	.74
I want to learn new information.	4.45	.63	4.74	.44
I enjoy learning new information.	4.66	.55	4.61	.49
I set specific times for my study.	3.59	1.02	3.16	1.04
I am self-disciplined.	4.00	.85	4.06	.93
I like to gather the facts before I make a decision.	4.10	.72	4.32	.75
I am disorganized.	3.62	1.01	4.03	.98
I am logical.	3.93	.70	4.23	.72
I am methodical.	3.79	.62	3.97	.55
I evaluate my own performance.	3.69	.76	4.32	.70
I prefer to set my own criteria on which to evaluate my performance.	3.28	.84	3.84	.86
I am responsible for my own decisions/actions.	4.69	.47	4.87	.34
I can be trusted to pursue my own learning	4.07	.70	4.35	.66

Table 21 continued.

I can find out information for myself.	4.17	.66	4.45	.77
I like to make decisions for myself.	4.45	.78	4.48	.77
I prefer to set my own goals.	4.17	.80	4.48	.67
I am not in control of my life.	4.00	1.13	4.52	1.00

Table 22

Independent Samples T-Test for Self-Directed Learning Readiness Scale Questions Comparing Contract Group Versus Non-Contract Control Group

Question	t	df	Sig.
I prioritize my work.	-2.468	58	.017*
I am systematic in my learning.	-2.148	58	.036*
I need to know why.	-2.242	58	.029*
I learn from my mistakes.	-2.047	58	.045*
I am open to new ideas.	-1.989	58	.050*
I am aware of my own limitations.	-1.968	58	.050*
I am confident in my ability to search out information.	-3.247	58	.002**
I want to learn new information.	-2.093	58	.041*
I evaluate my own performance.	-3.352	58	.001***
I prefer to set my own criteria on which to evaluate my performance.	-2.561	58	.013*

*p<.05; **p<.01; ***p<.001

The SAE only group had a higher mean SDLRS total score (x= 171.60, s= 10.65) compared to the learning contract group (x= 166.75, s= 15.15). The researcher failed to reject the null hypothesis because these scores were not statistically significant and indicated that both groups were fit to use self-directed learning techniques (t= -1.171, df=

38, p= .249). A correlation analysis was run to determine the relationship of scores on the Exam Preparedness Survey and the Self-Directed Learning Readiness Scale. For all 40 participants the Pearson Correlation was .530*** (p<.000). The correlation for learning contract group was .375 and for the SAE only control group .716.

NH3: There is no difference in first-time pass rates on the BOC examination, when viewing students who use learning contracts and SAEs compared to students who use SAEs without a learning contract.

Table 23

Passing Rates on the BOC Examination for Study Participants

Group	N	1st Time Pass	%
Learning Contract Students	20	18	90%
SAE Only Control Group	20	17	85%*

*After data analysis window ended (August 1st) two more students from the SAE Only Control Group completed the BOC Examination. Both of these students failed the exam which would move the % pass rate for the control group to 77%.

NH4: There is no difference in first-time pass rates on the BOC examination, when comparing the three-year national average passing rates to the pass rates of students who used learning contracts and SAEs or the SAE only group.

Table 24

Passing Rates on the BOC Examination for Study Participants Versus Three-Year National Average Passing Rates

Group	N	1st Time Pass	%
Learning Contract Students	20	18	90%
SAE Only Control Students	20	17	85%
3-Year National Average			81%

Table 24 continued.	
2015-2016	81%
2014-2015	78%
2013-2014	77%
2012-2013	78%
2011-2012	77%

*After data analysis window ended (August 1st) two more students from the SAE Only Control Group completed the BOC Examination. Both of these students failed the exam which would move the % pass rate for the control group to 77%.

H5: There is no difference in scores for Self-Assessment Examinations and BOC scores when comparing students who use learning contracts and students who choose not to.

Table 25

Descriptive Statistics for Mean Scores of Self-Assessment Examinations and Final BOC Examination for Learning Contract Group and SAE Only Group

Examination	N	Mean	Standard Deviation
Pre-Study Self-Assessment Score			
Learning Contract Students	29	59.64	9.58
SAE Only Control Students	30	57.86	7.12
Post-Study Self-Assessment Score			
Learning Contract Students	24	67.49	10.89
SAE Only Control Students	27	60.71	7.53
BOC Examination			
Learning Contract Students	20	76.61	6.59
SAE Only Control Students	20	74.60	6.09

The mean scores in the table are based on percent correct in each one of the five domains of athletic training. The five domains included domain I injury and illness prevention and wellness promotion, domain II examination, assessment and diagnosis,

domain III immediate and emergency care, domain IV therapeutic intervention, and domain V healthcare administration and professional responsibility.

Table 26

Independent Samples T-Test Comparing Learning Contract Students to Control Group for Self-Assessment Examinations and Final BOC Examination

Variable	t	df	Sig. (2-tailed)
Pre-Study Self-Assessment Examination	.812	57	.323
Post-Study Self-Assessment Examination	2.608	49	.012*
BOC Examination	1.002	38	.420

*p<.05; **p<.01; ***p<.001

Of the three examinations/assessments the students took only one of the three demonstrated a statistically significant difference. For the Post-Study Self-Assessment Examination, the learning contract cohort scored statistically higher (Mean of 67.49) when compared to the SAE-only group (60.71).

Table 27

Paired Sample T-Tests for Self-Assessment Examinations & BOC Examination Based upon Group Membership

Examination	N	Mean	Std. Dev.
Pre-Study SAE & Post-Study SAE			
Treatment Group (Pre-SAE)	24	61.17	8.73
Treatment Group (Post-SAE)	24	67.49	10.89*
Control Group (Pre-SAE)	27	58.93	6.65
Control Group (Post-SAE)	27	60.71	7.53

Table 27 continued.

Pre-study SAE & BOC Examination			
Treatment Group (Pre-SAE)	20	62.65	8.69
Treatment Group (BOC)	20	76.61	6.59**
Control Group (Pre-SAE)	20	59.45	7.30
Control Group (BOC)	20	74.60	6.09***
Post-Study SAE & BOC Examination			
Treatment Group (Post-SAE)	20	68.88	11.26
Treatment Group (BOC)	20	76.61	6.59**
Control Group (Post-SAE)	20	62.43	7.75
Control Group (BOC)	20	74.69	6.09***

*p<.05; **p<.01; ***p<.001

Table 27 presents the paired sample *t*-test analysis looking at statistical differences between the three sittings of the athletic training assessments. The Learning Contract Group experienced a statistically significant jump in scores from the Pre-Study SAE to the Post-Study SAE (t= -2.631, df=23, p = .015), the Pre-Study SAE to the BOC Examination (t=-9.853, df=19, p=.000) and the Post-Study SAE to the BOC Examination (t=-3.310, df=19, p=.004).

Additionally, the SAE only control group also experienced a statistically significant jump in scores between the Pre-Study SAE and the final BOC Examination (t=-7.863, df=19, p=.000) and the Post-Study SAE and BOC Examination (t=-5.658, df=19, p=.000).

Overall, 18 out of 20 (90%) "learning contract" participants earned a first-time passing score on the BOC final examination. The control group (SAE-only group) had 17 of 20 (85%) earn the first-time passing score.

H6: There is no relationship of Grade point average to success on the BOC examination regardless of participation in SAEs or a student-self-developed learning contract.

Table 28

Correlation Analysis for GPA and BOC Raw Score

Variable	GPA	BOC Raw Score
GPA		
Pearson Correlation	1	0.481
Sig. (2-tailed)		0.002**
N	60	40
BOC Raw Score		
Pearson Correlation	0.481	1
Sig. (2-tailed)	0.002**	
N	40	40

Note. *p < .05; **p < .01; ***p < .001.

There was a statistically significant positive Pearson Correlation coefficient calculated and determined by SPSS between Grade Point Average and score on the BOC examination (.481). This would suggest that GPA can be used as an effective predictor for higher scores on the final BOC examination (Babbie, 1992). Based on this finding the researcher rejected the null hypothesis.

Qualitative Results

What is your understanding of what a learning contract is?

The focus group generally summarized that a learning contract was a tool for organizing, planning, creating accountability, and studying. One participant stated a learning contract was, 'Organizing information and prioritizing whatever I need to study first or whatever I have to work on. It was a huge help for me because I was like Wow, where do I start and it helped me to organize.' Another participant stated the learning contract, 'Helped me schedule out when to study. The test we took (SAE) helped me to focus on what to study more instead of studying things I already knew because that would be a waste of time.' A third focus group participant stated that the, 'SAE provided a needs analysis' that was used to help in the planning phase when creating the learning contract. One of the students discussed accountability and stated, 'Gives you a sense of accountability. It is out in front of you and shows that I need to do this or spend more time doing something else. Contract provided the accountability because it was written down.' The last student stated that the learning contract, 'Helped me in all the ways mentioned already. It showed where I was strong and weak and used it to try to improve weaknesses in the clinic as well.'

In what ways if any, did you find using learning contracts to be useful?

Five of the six focus group participants expressed that the learning contract helped them diagnose their learning gaps. These five students agreed that the learning contract, 'Helped me to know what I didn't know.' The other participant agreed also and stated 'The mental game to approach the test. This test depends on future and success. The learning contract also helped make myself sure of what I need to know.'

Describe your overall experience with the self-directed learning tool, Learning contracts.

The focus group participants all had positive feedback regarding the learning contract. Multiple students stated the SAEs made a huge difference and the learning contract helped in breaking down how to study. Another student was more specific regarding what they put on the learning contract and stated,

> I put NATA position statements on the learning contract and mapping them out on learning contract was helpful. We went over them in class but it was helpful to go back as I was able to retain info better. If I didn't put it on the learning contract I don't think I would have gone back to read them.

How has the use of learning contracts contributed to you preparing for the BOC exam?

The focus group agreed that learning contracts helped them prepare for the BOC exam by planning out, 'Reading the introduction to athletic training book, front to back.' Another student stated again that it helped with, 'Reading position statements.'

Describe your overall satisfaction with the facilitators of the in-person training on learning contracts.

The focus group described a positive level of satisfaction with one student stating, 'I couldn't write my own learning contract without having the self-assessment exam.' A second student mentioned that they, 'Couldn't make a learning contract on my own and the guidance was useful. Being told the reason why backed up why we were doing it.' Another student was supportive and said, 'It was hard for me to get an approach to study for the BOC exam. There is way too much information. Feeling out a way to study was

hard, I would read and highlight. I need more training on how to study material and found the learning contract training helpful in providing a technique to study.' Lastly, one of the students was skeptical of the learning contract and stated, 'At first I was like this isn't going to work for me but after going through it and sticking to it I found how it could be useful. If the student isn't committed to the learning contract it wouldn't be useful.'

Describe the struggles you encountered while using learning contracts.

The focus group described many struggles while using the learning contract. The group stated things like, 'It was hard to stick to what I wrote' and, 'The timeline. I said I was going to read something daily and I didn't stick to that every week. Sometimes I had to take a few days off.' A third student stated, 'I set unrealistic expectation for myself.' Another student stated, 'I found it hard because I would be reading about sections I didn't know and would find more information about things I didn't know. But then I would get behind on how I wanted to progress in my reading.' The focus group facilitator asked the student after that answer, 'Did spending the extra time in those areas help you on the BOC exam?' The participant answered, 'Yes and No. Reading the intro book was the best thing I did I felt over prepared going into the exam. I thought the test was easy.' Three of the other focus group members voiced that reading the intro book was the best thing they did to study. A fifth participant also expressed confidence after taking the exam. They stated, 'I felt confident coming out of the exam as well. When reading questions, I had a few that I felt I needed to use process of elimination but majority felt like I read the answer and knew it, that's the correct answer.'

Describe any other methods you used to study for the BOC exam that were not part of your learning contract.

Participants described several other methods for studying for the BOC exam. One student said, 'The last 3 years prepared me. That allowed me to focus on areas I felt I was lacking.' As mentioned previously by participants another student said, 'Reading the introduction to athletic training book.' Clinical Experiences were often stated as a way participants learned and studied over time. One students stated, 'Applying knowledge to the clinical setting.' Another student said, 'Covering practices. Being a senior AT student for football was a huge benefit for me. I had a few major injuries during that rotation and was involved in the management of those. Clinical experience was beneficial.' A third student stated,

> Taking things away from the clinical setting. A lot of times if I was doing rehab projects, I would research things like why aren't they progressing or why are they lacking in an area. Then I would apply answers I have found to their rehabs. Being able to find information on your own was important.

Students appeared to agree on the aspect that clinical experience was important. The focus group facilitator followed up by asking, 'What specifically about clinicals stayed with you for taking the BOC exam?' Three students responded. One stated, 'Evaluations of injuries. I need to know condition and create a differential diagnosis.' A second student said, 'History of injuries, mechanisms, signs and symptoms for guiding evaluation.' The final students stated, 'Sometimes theory is different than actual findings.'

In what ways has your thoughts regarding self-directed learning changed?

Participants answered this question in a variety of ways. One student stated, 'Do your research first. Have a base of knowledge. Don't just ask a question to your preceptor, have a base knowledge.' A second participant said, 'Depends on situation, sometimes I am just passive.' Four of the participants spoke about motivating factors to be self-directed learners. One participant said, 'You have to be self-motivated learning because you are taking care of people's life. You never know. It's scary and fascinating at the same time. You have to know it. It's a responsibility.' Another participant used competition within their cohort as motivation and said, 'It is so on the individual. I had competition because I didn't want to be second best.' One participant's motivation was money. They stated, 'It's a $335 test. That was a motivator also. Money talks. Passing the test is also going to propel you into your professional career.' Lastly, a participant used the idea of patient care as a motivator to use self-directed learning. They stated, 'For me it doesn't make sense for me to spend 4 years in school and not pass. How can I tell someone I am here to care for you but I didn't pass my exam? That idea drove me crazy.'

Are learning contracts something you would implement in the future? Why or why not?

The participants all stated they would use learning contracts again if they had a tool to help diagnose their learning needs. One participants said, 'Yes, with another tool or instrument to diagnose needs.' Another participant said something similar, 'If I had quantitative results, yes. If I had something else to compare or have a baseline to start with.' A third participant echoed the baseline statement and said, 'Feedback to be able to set a plan really helped. The first SAE helped set the baseline. If I didn't have that it is a

huge task. It's like the Great Wall of China, really huge. But the first SAE created that baseline.'

Why did you agree to participate in this study?

Students agreed to participate in the study for a variety of reasons. One student stated, 'It was an opportunity to structure my thoughts' while another said, 'To kick start my studying.' A third student said, 'It was a perfect opportunity to know what I was facing.' Two participants mentioned the SAE portion of the study. They said, 'To have access to free tests (SAE) and helping another professional out by donating time to someone else' and 'It was a good chance to start studying and take 2 SAE's to see if studying is paying off.' The last participant stated, 'Our profession is growing and for it to grow we need to support those who are trying to help it grow.'

In what ways can learning contracts be incorporated into an athletic training curriculum?

Participants provided suggestions as to where athletic training programs could use learning contracts. One participant said, 'For undergraduate course work you could map it out by test.' Another said, 'It could be used as a good motivation tool or provide somewhere to start.' A third student provided another specific recommendation and said, 'In my senior seminar class we could have made learning contracts based on using the practice test book. No one structured it that way.' Another student gave a specific recommendation based on their program requirements. She said, 'I could have used it for studying for the senior oral practical exam.' Lastly, a student made a recommendation based on a hands-on class opposed to a more tradition class, 'Definitely for hands on oral practical but not for pharmacology or organization and administration.'

Could learning contracts be incorporated into clinical experiences?

Focus group participants did not think it would be a good idea to have learning contracts in their learning experiences. One student stated, 'I don't think it would have been beneficial for me. I was overloaded with classes and clinical rotation. I liked having it at the end.' Another student said something similar, 'I liked it as a study tool instead of a learning tool.' The next participant said, 'I wouldn't have done it as a sophomore. I was overwhelmed at that time and would have seen it as extra work.' Along a similar thought process another student mentioned, 'It could be helpful if applied after the second year. I didn't have enough experience to know what I need to know.' A fifth student said, 'Maybe you could implement it into the master's degree but clinicals take up a ton of time.' The last student gave a suggestion that was not based on clinical experience and said, 'If you used it after your Junior oral practical you could create a learning contract for the senior op by writing a plan for areas you struggled.'

Did you finish your learning contract?

The majority of the focus group did not finish the learning contract that they had created. One out of the five did complete the learning contract. One participant said, 'No, I stuck with it until the last month before exam.' Another student said something similar, 'I followed it until the month before my scheduled date and then panicked and tried to study things I didn't know.' A third similar comment was, 'I stuck with it until the last two weeks. Then went back to minor details.' The final response to the questions was, 'No, I wasn't detailed enough in the beginning. I didn't know how to start the process of studying in the beginning.'

Summary

The data collected provided an inclusive view of the use of learning contracts and its application to preparation for the BOC examination. According to the data the following results were produced:

1. Both the learning contract group and the self-assessment examination group had overall similarities in perceived BOC examination preparedness.
2. There was no statistical difference in the self-directed learning readiness scale however, the self-assessment examination only group did have a higher mean total score.
3. No statistical difference was found in first time BOC examination pass rates. There was some evidence to suggest that if the N was higher the learning contract group would have a statistically significant higher pass rate than the self-assessment examination group.
4. The first time pass rates between the self-assessment examination group and the three-year national average were similar. The SAE only group passed at a rate of 85% while past three-year national average was 81%. Meanwhile, the learning contract group had a first time pass rate of 90%.
5. Both groups participated in pre-test SAEs and post-test SAEs. The groups scored similar on the pre-test. However, the learning contract group scored statistically higher on the post-test when compared to the

SAE only group (Learning Contract Mean = 67.49, SAE only Mean = 60.71).

6. A Pearson Correlation coefficient suggested that a higher grade point average at the bachelor's level was an effective predictor for higher BOC examination scores.

Qualitative data showed support for the use of learning contracts and offered some insight into why the learning contract group had more success in areas. Themes were identified using an Excel format to interpret the qualitative data and included learning contracts were useful in diagnosing learning needs, organizing, and planning. In addition, the qualitative data suggested that self-assessment examination were a useful instrument in preparing for the BOC examination.

Chapter Five: Summary and Discussion

This study was a mixed methods study that focused on athletic training BOC examination candidates and a self-directed learning tool known as learning contracts. The study focused on the following research question: What is the relationship between the use of learning contracts and successful preparation for the BOC as measured by first-time passing rates on the BOC exam?

The study also focused on six research null hypotheses:

NH1: There is no difference in scores for Exam Preparedness, when viewing students who use learning contracts and SAEs compared to students who use SAEs without a learning contract.

NH2: There is no difference in scores for Self-Directed Learning Readiness when viewing students who use learning contracts and SAEs compared to students who use SAEs without a learning contract.

NH3: There is no difference in first-time pass rates on the BOC examination, when viewing students who use learning contracts and SAEs compared to students who use SAEs without a learning contract.

NH4: There is no difference in first-time pass rates on the BOC examination, when comparing the three-year national average passing rates to the pass rates of students who used learning contracts and SAEs or the SAE only group.

NH5: There is no difference in scores for Self-Assessment Examinations and BOC scores when comparing students who use learning contracts and students who choose not to.

H6: There is no relationship of Grade Point Average to success on the BOC examination regardless of participation in SAEs or a student-self-developed learning contract.

Summary of Findings

Research Question

What is the relationship between the use of learning contracts and successful preparation for the BOC as measured by passing rates on the BOC exam?

Quantitatively, the data showed that the participants who participated in the learning contracts and SAE group passed the BOC at a rate of 90%. The SAE only group also passed at a high rate of 85%. The pass rates were not significantly different; however qualitative data would support the notion that learning contracts helped BOC examination candidates prepare for the BOC examination. The vast majority of the focus group participants agreed that learning contracts helped them diagnose their learning needs, helped them organize, and create a study plan for a task that seemed large and overwhelming.

Null Hypothesis One

NH1: There is no difference in scores for Exam Preparedness, when viewing students who use learning contracts and SAEs compared to students who use SAEs without a learning contract.

There is not enough evidence to reject the null hypothesis. Table 19 and Table 20 presented data that indicates that there is not a significant difference in BOC exam preparedness. There were two questions that were statistically, significantly higher for the non-learning contract group, questions 4 and 5. One question was statistically

significant in favor of the learning contract group, question 20. However, overall both groups felt unprepared to take the BOC certification examination.

Null Hypothesis Two

NH2: There is no difference in scores for Self-Directed Learning Readiness when viewing students who use learning contracts and SAEs compared to students who use SAEs without a learning contract.

There was not enough evidence to reject the null hypothesis. Data obtained in Table 21 and Table 22 indicated that there was no difference in the self-directed readiness of the participants. As identified in previous studies by Fisher et al. (2001) a score above 150 indicates a readiness towards self-directed learning. Both the learning contract group and the SAE only group had mean scores above 150 providing evidence that they were good candidates for self-directed learning techniques.

Null Hypothesis Three

NH3: There is no difference in first-time pass rates on the BOC examination, when viewing students who use learning contracts and SAEs compared to students who use SAEs without a learning contract.

Based on the data obtained in Table 23, there is not enough evidence to reject null hypothesis 3. Both groups passed the BOC examination at a rate above the national average while the learning contract and SAE group passed at a slightly higher rate of ninety percent compared to eighty-five percent for the SAE only group. The passing rate however was not significantly different.

Null Hypothesis Four

NH4: There is no difference in first-time pass rates on the BOC examination, when comparing the three-year national average passing rates to the pass rates of students who used learning contracts and SAEs or the SAE only group.

There is evidence to reject the null hypothesis for the learning contract and SAE group only. The pass rates on the BOC examination for the previous three-years were reported by CAATE (2016b) and showed that the national pass-rate for the previous three-year period for first time test takers was 81% for all undergraduate professional athletic training programs (para 2). The SAE only group had a first time pass rate of 85% while the learning contract and SAE group had a 90% first time pass rate. In addition, the athletic training programs that had participants in the study had an average three-year pass rate of 68%.

Null Hypothesis Five

NH5: There is no difference in scores for Self-Assessment Examinations and BOC Scores when comparing students who use learning contracts and students who choose not to.

There is support to reject null hypothesis five. Table 25 provided data to show that of the three examinations/assessments the students took only one of the three demonstrated a statistically significant difference. For the Post-Study Self-Assessment Examination, the learning contract cohort scored statistically higher (Mean of 67.49) when compared to the SAE-only group (60.71). In addition, after the data analysis window ended (August 1st) two more students from the SAE Only Control Group completed the BOC Examination and reported whether they passed or failed. Both of these students failed the exam which would move the percent pass rate for the control

group to 77% indicating a significant statistical difference would be present compared to the 90% passing rate of the learning contract group.

Null Hypothesis Six

NH6: There is no relationship of Grade Point Average to success on the BOC examination regardless of participation in SAEs or a student-self-developed learning contract.

There is support to reject null hypothesis six. Table 28 indicates there was a statistically significant positive Pearson Correlation coefficient calculated and determined by SPSS between Grade Point Average and score on the BOC examination (.481). This would suggest that GPA can be used as an effective predictor for higher scores on the final BOC examination.

Practical Implications

Self-directed learning and the use of learning contracts is worth exploring more in athletic training education. Self-directed learning is a skill that must be effectively used by healthcare providers to stay current in the ever changing medical landscape. The learning contract is a useful, proven instrument (Dix & Hughes, 2004; Murad et al., 2010; Pai et al., 2014) to help healthcare students develop self-directed learning skills. In addition, if the number of participants were larger the researcher believes that the learning contract and SAE group would have produced significantly higher scores on the BOC exam than the SAE group only. The researcher also believes that the BOC examination pass rate would have been statistically higher for the group utilizing learning contracts. This belief was further verified when two participants from the SAE only group reported after the data was analyzed that their BOC examination attempt produced

a failed score. The failed scores would have lowered the SAE group's first time pass rate further.

The SAEs produced by the BOC are an effective instrument to help the students diagnose readiness and prepare them to take the BOC examination. The scores on the participants' SAE post-tests showed significant improvement over the pre-test. This would indicate that athletic training programs, or more specifically athletic training students, should use the SAEs as an instrument to diagnose readiness to pass the BOC examination. The participants of the study frequently commented that the BOC SAEs were extremely helpful for their preparation.

This study also showed that a higher GPA correlates to success on the BOC examination. This supports the use of GPA as one of the primary tools for selecting athletic training students in the admissions process. This finding is not a surprise and may lead some athletic training programs to consider not having an open admissions process if the BOC first time pass rate is of concern to them.

Lastly, the researcher developed a diagnostic tool called the Exam Preparedness Survey. This tool along with the Self-Directed Learning Readiness Scale provided data that suggested that the tools can assess readiness and preparedness for the BOC examination. The researcher suggests further exploration of the tools used to diagnose readiness and preparedness of athletic training students preparing to take the BOC examination.

Limitations

The researcher used a mixed methods study to attempt to gain a clearer insight into the use of learning contracts for BOC examination preparation. As with studies of

this nature there were several limitations to be considered. The first limitation was the number of participants. The researcher recruited participants that attended colleges and universities that were within four and half hours from the researcher. This limited the number of participants in the study causing the quantitative data to not be as generalizable to a large group of participants. In addition, the participants were a convenience sample. Essentially study participants self-selected to the treatment group and control groups. The learning contract group participated in a workshop to become familiar with learning contracts therefore, the participants that volunteered for that group traveled no more than two hours to attend the training session. The participants also self-selected the group they wanted to participate in, either the learning contract and SAE group or the SAE only group. Another limitation to the study was BOC test dates. Some participants had more time to prepare as the test takers in the study took the BOC examination in either the January/February test window, March/April test window, or the June/July test window. The researcher was aware of this limitation and could not control when a BOC examination candidate took their examination. Many of the participants originally self-reported that they would take the January/February or March/April BOC examination. Only three participants actually took the BOC examination during the January/February test date. Some of the original participants had not taken the BOC examination at the time of publication for a variety of reasons. The last limitation that the researcher was aware of was the participants were not prevented from using other resources to study or diagnose learning needs. For example, many of the participants noted that they attended the ACES workshop during the school year as a requirement of their education program.

Recommendations for Future Research

With any research study there are typically recommendations for future research. The researcher believed that a mixed method study was appropriate to investigate the topic more deeply. The learning contract has been a time-tested instrument in healthcare education yet very limited research was found regarding learning contract use in athletic training education. One of the most obvious recommendations from this study is to replicate the study with a larger number of participants. Having a larger number of participants would allow the results to be more generalizable. Another recommendation for future research would be to have a true control group within this study. It would have been potentially useful to have a group of BOC candidates who did not participate in learning contracts or SAE use as an additional control group. Additionally, using learning contracts to increase self-directed learning in clinical experiences could be another area to study. This study focused solely on the preparation for the BOC examination. Other healthcare education professionals have studied the use of learning contracts in clinical education. The studies have commonly reported positive results in self-directed learning that resulted in deeper learning.

Conclusion

Athletic training is continuing to evolve in both education requirements and in presence as a healthcare provider. Growth in both areas will inevitable draw comparisons to other healthcare education fields and their preparation. The pass rates of first time test takers on the BOC exam has traditionally been lower than first time pass rates of other healthcare provider certification examinations. Additionally, higher education is under scrutiny to provide consumers with results for the consumers' ever increasing student

loan debt. This study provided evidence of one technique, learning contracts, which can be used to increase success on the BOC examination as well as provide students with a self-directed learning technique that is beneficial throughout the professional's career in healthcare.

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Appendices

Appendix A: Learning Contract Example

Learning Objectives (What will you learn?)	**Learning Strategies/Tactics** (How will you learn it?)	**Timeline** (By when will you learn it?)	**Evidence** (How will you know you learned it?)	**Validation** (How will you know it was the right thing to do to meet your learning objective?)
Increase **knowledge** of Principles of Athletic Training textbook	-Read and outline the chapters -Design and implement a study calendar	-End of January -End of September	-Completed outline of chapters in the textbook -Study Calendar implemented	-Program Director, Clinical Coordinator, or preceptor feel the outline was appropriate -Developer of learning contract feels the study calendar is realistic, comprehensive, and workable
Develop an **understanding** of the NATA position statements	-Read and highlight position statements -Write down unfamiliar words or ideas in position statements.	-End of January	-Completed the readings and highlighted key points	-Extent to which the developer of the learning contract can confidently answer practice test questions based on NATA position statements
Acquire **skill** in BOC test taking	-Take practice tests written in BOC likeness.	- Monthly practice tests starting in September and ending in January	-Tests scores recorded for each practice test	-Increased test scores over established practice timeline.

Appendix B: Participant Learning Contract

BOC Preparation Learning Contract

Learning Objectives (What will you learn?)	Learning Strategies/Tactics (How will you learn it?)	Timeline (By when will you learn it?)	Evidence (How will you know you learned it?)	Validation (How will you know it was the right thing to do to meet your learning objective?)
Emergency care situations	Reviewing Intro to AT book	by end of December	take additional SAE, OP	varify through clinical director / Senior Sem instructor
cranial nerves, dermatomes, myotomes, reflexes	↓	↓ by Oct.	↓	↓ OP Exam
healing process	modalities book	by November	SAE,	TBOT on SAE in Jan
first aid / CPR/AED use	American Red Cross Review	by November	simulations, OP	handle mock scenario correctly
gen med understanding	review gen med book	by Dec.	simulations	review with preceptor
diagnosing injuries	review etiologies	by Nov.	mock evals	correct diagnosis

Appendix C: Self-Directed Learning Readiness Scale

SDLRS for NE

Name: _____ School: _____

Age: _____ GPA: _____ Anticipated Date for Sitting BOC Exam: _____

Please answer the following questions truthfully as to the extent to which the item describes you. Questions are on a 5-point Likert scale ranging from 1=strongly Disagree to 7=Strongly Agree. Please circle the response that best meets your personal judgment for each question.

	Strongly Disagree		Neutral		Strongly Agree
1. I solve problems using a plan.	1	2	3	4	5
2. I prioritize my work.	1	2	3	4	5
3. I do not manage my time well.	1	2	3	4	5
4. I have good management skills.	1	2	3	4	5
5. I set strict time frames.	1	2	3	4	5
6. I prefer to plan my own learning.	1	2	3	4	5
7. I am systematic in my learning.	1	2	3	4	5
8. I am able to focus on a problem.	1	2	3	4	5
9. I need to know why.	1	2	3	4	5
10. I critically evaluate new ideas.	1	2	3	4	5
11. I prefer to set my own learning goals.	1	2	3	4	5
12. I learn from my mistakes.	1	2	3	4	5
13. I am open to new ideas.	1	2	3	4	5
14. When presented with a problem I cannot resolve, I will ask for assistance.	1	2	3	4	5
15. I am responsible.	1	2	3	4	5
16. I like to evaluate what I do.	1	2	3	4	5
17. I have high personal expectations.	1	2	3	4	5
18. I have high personal standards.	1	2	3	4	5
19. I have high beliefs in my abilities.	1	2	3	4	5
20. I am aware of my own limitations.	1	2	3	4	5
21. I am confident in my ability to search out information.	1	2	3	4	5
22. I do not enjoy studying.	1	2	3	4	5
23. I have a need to learn.	1	2	3	4	5
24. I enjoy a challenge.	1	2	3	4	5
25. I want to learn new information.	1	2	3	4	5

26. I enjoy learning new information.	1	2	3	4	5
27. I set specific times for my study.	1	2	3	4	5
28. I am self-disciplined.	1	2	3	4	5
29. I like to gather the facts before I make a decision	1	2	3	4	5
30. I am disorganized.	1	2	3	4	5
31. I am logical.	1	2	3	4	5
32. I am methodical	1	2	3	4	5
33. I evaluate my own performance	1	2	3	4	5
34. I prefer to set my own criteria on which to evaluate my performance	1	2	3	4	5
35. I am responsible for my own decisions/actions	1	2	3	4	5
36. I can be trusted to pursue my own learning	1	2	3	4	5
37. I can find out information for myself	1	2	3	4	5
38. I like to make decisions for myself	1	2	3	4	5
39. I prefer to set my own goals	1	2	3	4	5
40. I am not in control of my life	1	2	3	4	5

Thank you for your participation in this survey!

Appendix D: Self-Directed Learning Readiness Scale Consent

PERMISSION TO USE THE SELF-DIRECTED LEARNING READINESS SCALE FOR NURSE EDUCATION

FROM: Murray Fisher, PhD, DipAppSc, BHSc, MHPEd.
Associate Professor
Faculty of Nursing and Midwifery
University of Sydney
murray.fisher@ sydney.edu.au

RE: Use of the **Self-Directed Learning Readiness Scale for Nurse Education**

You are free to use the Self-Directed Learning Readiness Scale for Nurse Education for your research. The instrument is copyrighted (c. 2001, Fisher, King & Tague) and may not be duplicated or copied without first submitting a signed copy of this permission form to M Fisher. Requests for any changes or alterations to the instrument should be made in writing to M Fisher. As with all revisions, the copyright will be retained by Fisher, King & Tague and must appear on the printed copies of the instrument.

By filling in your name, address, phone number, and e-mail address and signing the agreement use below and mailing it to M Fisher, you are hereby given permission to use the Self-Directed Learning Readiness Scale for Nurse Education for your research. The permission is valid only for the study named below.

Fisher, King & Tague requests that you send back the following information:

- your raw data in ASCII format for our reliability and validity bank
- copies of any changes or translations of the scale
- copies of any publications citing the use of the scale

When using the Self-Directed Learning Readiness Scale for Nurse Education you need to use the following two references:

Fisher, M., King, J. & Tague, G. (2001) Development of a self-directed learning readiness scale for nurse education. Nurse Education Today, 21(7): 516-525.

Fisher, M.J. & King, J. (2010) The Self-Directed Learning Readiness Scale for Nursing Education revisited: A confirmatory factor analysis. *Nurse Education Today,* 30(1): 44-48.

AGREEMENT TO USE THE SELF-DIRECTED LEARNING READINESS SCALE FOR NURSE EDUCATION

I agree to the above conditions for using the Self- Directed Learning Readiness Scale For Nurse Education.

Name: William E Dill II

Title:

E-mail: wdill@lindenwood.edu

Address: 2600 W. Main St., Belleville, IL 62226

Academic/business affiliation: Lindenwood University

Phone Number: 618-671-6133

Study Title:

Exploring the Application of Learning Contracts to Athletic Training Board Certification Exam Preparation

Brief Description of Study:

The proposed study is an exploratory study into the effectiveness and efficacy of using learning contracts to support success on the National Athletic Training Certification Examination. The study will have 2 groups of athletic training students preparing to take their board of certification examination. Both groups will have their self-directedness measured and take 2 self-assessment examinations prior to board certification examination. Group one however will be guided in designing a learning contract to guide self-directed learning to prepare for the board of certification examination.

Signature  Date 10/3/16

Please keep a copy of this form in your files.

Mail to:
Murray Fisher
Faculty of Nursing and Midwifery
The University of Sydney
88 Mallett St
Camperdown NSW Australia 2006

Appendix E: Perceived Benefits of Contract Learning Questionnaire

(1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree, 5 = strongly disagree)

The learning contract was easy to make.	1	2	3	4	5
It is easy to identify the appropriate objectives, resources, evidence of accomplishment, and assessment criteria.	1	2	3	4	5
I can implement what I have planned in the learning contract.	1	2	3	4	5
It is easy to get access to the relevant learning resources.	1	2	3	4	5
The instruction on using learning contracts is adequate.	1	2	3	4	5
The clinical supervisor is supportive of this process.	1	2	3	4	5
There are sufficient resources provided by the university.	1	2	3	4	5
There are sufficient resources provided by the ward.	1	2	3	4	5
I can learn deeply and permanently from the learning contract.	1	2	3	4	5
The learning contract can help me relate knowledge to practice.	1	2	3	4	5
The learning contract can help me apply knowledge to practice.	1	2	3	4	5
The learning contract can help me improve my clinical skills.	1	2	3	4	5
The learning contract has given me more confidence in my own capabilities.	1	2	3	4	5
The learning contract increases my responsibility in the subject.	1	2	3	4	5
The use of learning contracts makes learning more self-directed.					

1 2 3 4 5

The learning contract increases my control in learning.

1 2 3 4 5

The learning contract increases my autonomy in learning.

1 2 3 4 5

The learning contract increases my motivation to learn.

1 2 3 4 5

I enjoy this kind of learning method.

1 2 3 4 5

The learning contract meets my learning needs.

1 2 3 4 5

I prefer to learn in this way rather than the conventional one.

1 2 3 4 5

The learning contract increases my interest in the subject.

1 2 3 4 5

Appendix F: Sample BOC Self-Assessment Exam

1. The parents of a 16-year-old swimmer contact an athletic trainer seeking nutritional advice for the athlete's pre-event meal. What recommendations should the athletic trainer share with the parents regarding ideal pre-event meals?

Choose all that apply.

- Include foods high in carbohydrates, high in proteins, and low in fats
- Include foods high in carbohydrates, low in proteins, and low in fats
- Include foods low in carbohydrates, low in proteins, and high in fats
- Prepare meals for eating four hours prior to the competition
- Prepare meals for eating two hours prior to competition
- Prepare meals with foods that delay gastric emptying
- Prepare meals with low-glycemic index foods
- Prepare meals without diuretics foods

2. Which modality would **Best** control pain in a two-day-old Grade I (mild) lateral ankle sprain in a 25-year-old male with Raynaud's phenomenon?

Choose only one.

- Continuous 3 MHz ultrasound
- Electrical stimulation – biphasic continuous current
- Ice massage
- Paraffin bath
- Warm whirlpool (100 degrees Fahrenheit/38 degrees Celsius)

3. Weakness of which muscle is associated with a Trendelenberg gait?

Choose only one.

- Gluteus medius
- Iliopsoas
- Gluteus maximus
- Rectus femoris
- Tensor fascia lata

4. Which motions are **MOST** important to limit following a second-degree anterior talofibular ligament sprain?

Choose only one.

- Dorsiflexion and eversion
- Dorsiflexion and inversion
- Inversion and eversion
- Plantarflexion and eversion
- Plantarflexion and inversion

5. During a high school softball game, an athletic trainer notices lightning in the sky followed five seconds later by a loud clap of thunder. What action should the athletic trainer take?

Choose only one.

- The game should be temporarily canceled
- The game should be postponed, and participants and spectators should leave the field
- The game should continue unless lightning comes closer to the field
- The participants should wait in the dugout
- The participants should seek shelter under the bleachers

6. Which mode of immobilization is **MOST** appropriate when an individual sustains an open, displaced fracture of the ulna and the individual's elbow is in a flexed position?

Choose only one.

- Air splint
- Plaster cast
- Fiberglass cast
- Traction splint
- Vacuum splint

7. Which of the following is the **MOST** important reason to use ground fault circuit interrupters in athletic training facilities?

Choose only one.

- They decrease the power of an electrical modality if a current leak is detected
- They detect water overflow of a whirlpool, which prevents the electrical shock of a patient receiving treatment
- They interrupt the power and shut down an electrical modality if a current leak is detected
- They prevent athletes from turning on and adjusting the intensity of electrical modalities
- They prevent damage to the turbine of a whirlpool if the motor is turned on without water present

8. When performing a manual muscle test of the quadriceps, a fair test (3/5) would indicate that the patient can complete which of the following?

Choose only one.

- Fully extend the knee when placed in a gravity-minimized position
- Fully extend the knee against moderate resistance with pain
- Fully extend the knee against gravity with no added resistance
- Extend the knee but not throughout the complete available range of motion
- Lift at least 10% of his/her bodyweight in a knee extension exercise

9. When examining a patient with low back pain, palpation reveals a “step-off” deformity at L4/L5. What differential diagnosis should the athletic trainer suspect?

Choose only one.
- Kyphosis
- Lordosis
- Scoliosis
- Spondylolisthesis

10. Which of the following tests determines the presence of a complete tear of the posterior cruciate ligament?

Choose only one.
- Anterior drawer
- Lachman’s
- McMurray’s
- Noble’s
- Posterior drawer

11. What **PRIMARY** insurance coverage would cover professional athletes in the event of an injury within their sport?

Choose only one.
- Health maintenance organization
- Medicaid
- Medicare
- Workers compensation

12. A widening of the mortise at the talocrural joint with a disruption if the tibiofibular ligament is indicative of which of the following conditions?

Choose only one.
- Os calcis fracture
- Sustentaculum tali fracture
- Syndesmosis sprain
- Talus fracture
- Tibialis posterior tendinitis

Please us the following information to answer questions 13-17.

In mid-August, two-a-day football practices are taking place at a university. The outside temperature is 85 degrees Fahrenheit (30 degrees Celsius). The relative humidity is 67 percent. The team has completed a full-contact scrimmage. As practice comes to an end, athletes are completing conditioning activities. A few repetitions into conditioning, a make offensive lineman approaches the athletic trainer complaining of a headache, nausea, and dizziness.

13. Which of the following actions should be included in the initial management of this athlete?

Choose all that apply.

- Activate EMS
- Administer acetaminophen to the athlete
- Assess the athlete's vital signs
- Have the athlete ingest 32 ounces (0.95 liters) of a sports drink
- Move the athlete to a shaded area

14. The athletic trainer considers potential conditions that might cause the athlete's complaint. These conditions include heat exhaustion, concussion, and unrelated medical. What condition is **MOST** likely present given each individual sign/symptom noted? **Match the potential condition from the toolbar on the left to the signs/symptoms listed in the table to the right. Each of the potential conditions can be used more than once.**

Concussion	Cool, clammy skin	Epistaxi**s**
Heat exhaustion	Dehydration	Tinnitus
Other medical condition	Dyspnea	Visual distribances

15. Which of the following actions should be included as part of the concussion assessment of the athlete?

Choose all that apply.

- Ask the athlete to count backward from 100 to 0 in increments of 7
- Assess deep tendon reflexes
- Assess extraocular movement
- Assess for sharp-dull sensations
- Complete a color word test
- Complete a graded symptoms checklist
- Complete a word recall test
- Perform a physical exertion test

http://www.bocatc.org/candidates/exam-preparation-tools/sample-exam-questions

Appendix G: Self-Assessment Exam mode score example

Exam Results By Content Domain

BOC Self-Assessment Exam Results For
Ric Flair
Exam Name
SAE 1 Exam
Exam Type
Self-Assessment Exam : Test Mode
Exam Completed
06/09/2015 8:34 AM CT
Purchased Exam ID
106

Download PDF

Domain	Percentage Correct	Strength/Weakness
Injury/Illness Prevention and Wellness Protection	86.67%	Possible Strength
Clinical Evaluation and Diagnosis	72.22%	Adequate
Immediate and Emergency Care	66.67%	Adequate
Treatment and Rehabilitation	17.65%	Possible Weakness
Organizational and Professional Helath and Well-Being	20.00%	Possible Weakness

PLEASE NOTE

1. Your percentage correct represents the percentage of questions that you answered correctly within that domain.
2. Your areas of strength and weakness are based on your percentage of correct responses within each domain. A percentage of correct responses above 85% results in a "strong" designation. A percentage of correct responses below 65% results in a "weak" designation.

DISCLAIMER

While your performance on this self assessment exam illustrated areas of strength and weakness, your performance on this self assessment exam does not predict your performance on the certification exam. This self assessment exam includes questions and problems developed by the BOC using similar procedures to those used for the BOC certification exam; however, these items will never appear on a certification exam. These items are examples of the types of items included on the certification exam and are presented in the same manner as the certification exam.

Appendix H: Learning Contract Group Recruiting Email

Dear Athletic Training Program Administrator,

My name is William Dill and I am an instructor at Lindenwood University. I am conducting research on self-directed learning and the potential relationship with passing the BOC examination. I am specifically looking at using a self-directed learning tool called Learning Contracts. The title of my study is "Exploring Learning Contracts to Athletic Training Board of Certification Exam Preparation". This study has been developed in partial completion of the Educational Leadership Doctorate Program at Lindenwood University.

I am in need of participants who are senior students preparing to take the BOC examination in the Spring of 2017. To participate in this study, the student would agree to travel to Lindenwood University on October 15, 2016 to participate in a 3-4 hour seminar. Lindenwood University is located at 209 S. Kingshighway, St. Charles, MO 63301. During this seminar the student with take a BOC Self-Assessment Exam on a computer free of charge, participate in the seminar, and develop a learning contract that they will agree to use to help self-direct their preparation for the BOC exam in the Spring 2017 semester. Additionally, the participant would agree to complete surveys and a follow-up Self-Assessment Exam. The follow-up self-assessment exam would be taken in early January. The participant would not need to travel for the follow-up exam as it can easily be taken on any computer with internet access. Again, this Self-Assessment examination would be free to the participant. Enclosed in this letter you will also find the tentative schedule for the October 15, 2016 seminar.

Participation in this study is completely voluntary. No personal information will be published in this study. Any personal information such as BOC scores and grade point averages will be protected and destroyed at the end of the study.

Interested participants should email William Dill at wdill@lindenwood.edu or call William Dill at 618-671-6133. Confirmation of participation is required by October 3, 2016. Thank-you in advance for your time and consideration to participate in this study.

Sincerely,

William Dill, MS, ATC, CSCS

William Dill, MS, ATC, CSCS

Doctoral Student at Lindenwood University

wdill@lindenwood.edu

618-671-6133

Learning Contracts Workshop

	Check-in the Field House see 19 on campus map
1:00PM - 1:05PM	Welcome – Introduction
1:05PM - 1:30PM	Living Lecture - Video and recent test takers share experiences
1:35PM - 2:20PM	Head to Computer lab for SAE (75 question test), print results when done
2:20PM - 2:30PM	10 minute Break
2:30PM - 2:40PM	Self-Directed Learning
2:40PM - 2:50PM	Tools to guide self-directed learning
2:50PM - 3:05PM	Self-Directed Learning Questionnaire
3:05PM - 3:55PM	Nuts and Bolts of Learning Contracts
3:55PM - 4:00PM	5 minute Break
	Begin developing your learning contract based on SAE etc
4:00PM - 4:20PM	Individualized time
4:20PM - 4:35PM	Then as a group
	Discussion
4:35PM - 4:45PM	What are you struggling with
4:45PM - 4:50PM	Share = volunteers
	Turn-in LC
4:50PM - 5:00PM	Expectations moving forward

Lindenwood University
209 S. Kingshighway
St. Charles, MO 63301

Appendix I: BOC, Inc SAE Approval Letter

From: Chad Kinart
To: Dill, William
Cc: Shannon Leftwich; Chad Kinart; Nathan Burns
Subject: RE: Question
Date: Monday, November 23, 2015 1:25:51 PM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png
image006.png
image007.png

Bill,

Hello! We would love to provide you 120 SAEs for your dissertation provided we receive acknowledgement within your final report and can receive/review a copy of the final report prior to being published.

Thanks,

CEUs are due this year! See your BOC Central™ profile for details and deadlines. | www.bocatc.org/boccentral
How did I do? Tell me in 30 seconds at www.bocatc.org/tellme

Chad Kinart, MS, ATC | BOC | Exam Development Manager
(402) 559-0091 x121 direct | (877) 262-3926 toll-free | (402) 561-0598 fax
1415 Harney St, Ste 200, Omaha, NE 68102

Appendix J: SAE Only Group Recruiting Email

Dear Athletic Training Program Administrator,

My name is William Dill and I am an instructor at Lindenwood University. I am conducting research on self-directed learning and the potential relationship with passing the BOC examination. I am specifically looking at using a self-directed learning tool called Learning Contracts. The title of my study is "Exploring Learning Contracts to Athletic Training Board of Certification Exam Preparation". This study has been developed in partial completion of the Educational Leadership Doctorate Program at Lindenwood University.

I am in need of participants who are senior students preparing to take the BOC examination in the Spring of 2017. To participate in this study, the student would agree to participate in a survey, take a free BOC Self-Assessment Examination test in October, take a repeat free BOC Self-Assessment Examination test in January, and take the BOC certification examination during the Spring 2017 semester. The participant will report pass/fail scores to the researcher.

Participation in this study is completely voluntary. No personal information will be published in this study. Any personal information such as BOC scores and grade point averages will be protected and destroyed at the end of the study.

Interested participants should email William Dill at wdill@lindenwood.edu or call William Dill at 618-671-6133. Confirmation of participation is required by October 28, 2016. Thank-you in advance for your time and consideration to participate in this study.

Sincerely,

William Dill, MS, ATC, CSCS

William Dill, MS, ATC, CSCS

Doctoral Student at Lindenwood University

wdill@lindenwood.edu

618-671-6133

Appendix K: Exam Preparedness Survey

Exam Preparedness Survey

Name: _____ School: _____

Age: _____ GPA: _____ Anticipated Date for Sitting BOC Exam: _____

Please answer the following questions truthfully as to general personal opinions towards self-directed learning and exam preparedness. Questions are on a 7-point Likert scale ranging from 1=strongly Disagree to 7=Strongly Agree. Please circle the response that best meets your personal judgment for each question.

	Strongly Disagree			Neutral			Strongly Agree
1. I consider myself well-prepared to pass the BOC exam.	1	2	3	4	5	6	7
2. I am confident in my ability to pass the BOC exam.	1	2	3	4	5	6	7
3. Participation in clinical experiences have prepared me to pass the BOC exam.	1	2	3	4	5	6	7
4. Interactions with preceptors have prepared me to pass the BOC exam.	1	2	3	4	5	6	7
5. Traditional lectures have prepared me to pass the BOC exam.	1	2	3	4	5	6	7
6. Engagement in hands-on lab experiences have prepared me to pass the BOC exam.	1	2	3	4	5	6	7
7. Senior capstone experience or oral practical has prepared me to pass the BOC exam.	1	2	3	4	5	6	7
8. Learning contracts are an effective tool in helping to prepare for the BOC exam.	1	2	3	4	5	6	7
9. Self-assessment exams are an effective tool in helping to prepare for the BOC exam.	1	2	3	4	5	6	7
10. Study guides are an effective tool in preparing for the BOC exam.	1	2	3	4	5	6	7
11. Attending workshops and seminars are an effective tool in preparing for the BOC exam.	1	2	3	4	5	6	7
12. Self-directed learning is important in preparing for the BOC exam.	1	2	3	4	5	6	7
13. Teacher-directed learning is important in preparing for the BOC exam.	1	2	3	4	5	6	7
14. I am highly motivated to pass the BOC exam.	1	2	3	4	5	6	7
15. I plan on pursuing a career in the field of Athletic Training.	1	2	3	4	5	6	7
16. I believe I have the practical knowledge required to pass the BOC exam.	1	2	3	4	5	6	7
17. I believe I have the theoretical knowledge required to pass the BOC exam.	1	2	3	4	5	6	7
18. My academic performance in the class-room has prepared me to pass the BOC exam.	1	2	3	4	5	6	7
19. I believe I will pass the BOC examination at the first attempt.	1	2	3	4	5	6	7
20. I am committed to studying hard to pass the BOC exam.	1	2	3	4	5	6	7

On a scale of 1 to 10 (1 being low and 10 being high) how would you rate your commitment to athletic training? 1 2 3 4 5 6 7 8 9 10

On a scale of 1 to 10 (1 being low and 10 being high) how would you rate your commitment to self-directed learning? 1 2 3 4 5 6 7 8 9 10

Thank you for your participation in this survey!

Vitae

William Dill, M.S., ATC, CSCS

EDUCATION

Doctorate of Educational Leadership with emphasis in Andragogy
Lindenwood University, St. Charles, MO
Anticipated Graduation: Fall 2017

Masters of Business Administration
McKendree University, Lebanon, IL
Anticipated Graduation: N/A

Masters of Science in Recreation and Sport Science with emphasis in Athletic Training
The Ohio University, Athens, OH
June 2004

Bachelor of Science in Athletic Training, minor in Health Education
McKendree College, Lebanon, IL
December 2002

PROFESSIONAL EXPERIENCE

Clinical Education Coordinator, Athletic Training, Instructor of Athletic Training, School of Health Sciences June 2017-Present
Lindenwood University, St. Charles, MO

- Instructor for Introduction to Athletic Training both online and in-person, Introduction to Athletic Training Lab, Principles of Rehabilitation, Care and Prevention of Athletic Injuries, Care and Prevention Lab, Therapeutic Exercise and Rehabilitation, Therapeutic Exercise and Rehabilitation Lab
- Developed online curriculum for Organization and Administration taking it from in-person to online.
- Recruit, train, evaluate, and engage preceptors for the Lindenwood University Athletic Training Program
- Manage social media platforms for Lindenwood University Athletic Training Program
- Engage students to develop research and present at the university and state/national conferences
- Manage a student learner driven research agenda
- Advise 45+ students in the athletic training program
- Recruit potential athletic training majors
- Serve on University committees

Chair, Department of Athletic Training, Assistant Program Director, Assistant Clinical Education Coordinator, Instructor of Athletic Training June 2015-June 2017
Lindenwood University – Belleville, IL

- Manage the Athletic Training Program for the Lindenwood University - Belleville campus and directly collaborate with Program Director in St. Charles.
- Scheduling of semester class offerings and responsible for reporting class book orders.
- Recruit and hire adjunct professors as needed.
- Conduct preceptor training for Belleville campus preceptors.
- Advise Athletic Training Students at Lindenwood University - Belleville campus. Currently advise 46 students.
- Obtain clinical site placements of athletic training students who are enrolled in Integrated Experience.
- Lindenwood University – Belleville Athletic Training site coordinator for Lindenwood University CAATE site visit (next site visit scheduled for 2018-2019).

- Prepare Lindenwood University – Belleville CAATE documents for Lindenwood University Athletic Training Program Director to include in CAATE self-study.
- Lindenwood University – Belleville Athletic Training Association club sponsor (LUBATA).
- Involvement in recruiting athletic training students.
- Instructor for Assessment of Athletic Injuries Lower Body, Assessment of Athletic Injuries Lower Body Lab, Assessment of Athletic Injuries Upper Body, Assessment of Athletic Injuries Upper Body Lab, First Aid/CPR/Sport Injuries, Current Topics, J-Term class ACES/BOC prep, Principles of Rehabilitation, Care and Prevention of Athletic Injuries, Care and Prevention Lab, Therapeutic Exercise and Rehabilitation, and Exercise Science Internship.

Head Athletic Trainer September 2010-June 2015
Lindenwood University – Belleville, Belleville, IL

- Managed the day-to-day operations of two Athletic Training Clinics.
- Supervised and mentored Assistant Athletic Trainers (3) and graduate assistant athletic trainers (7).
- Grew staff from 2 graduate assistants to (3) full-time assistants and (7) graduate assistants.
- Student-Athlete population grew from 200 in 2010 to 1000 in 2014. The number of sports grew from 12 to 32 in that same time period.
- Recruited and hired certified athletic trainer graduate assistants.
- Controlled inventory, purchasing, and approving payment of supplies.
- Coordinated physician care and developed relationship with local physician and hospital that lead to a team physician status.
- Developed and maintained policies and procedures including but not limited to EAP's, Concussion Protocols, Policies and Procedure Manual, etc.
- Primary Athletic Trainer for football ('12-'15), men's and women's soccer ('10-'12), men's basketball ('10-'12), and men's lacrosse ('11-'12).
- Developed and administered the 2+2 Athletic Training Curriculum and Exercise Science program for the Belleville campus under the Accreditation of our St. Charles, MO campus. This eventually led to 4-year program in both programs.
- Developed and maintained an off-site clinical rotation with Saint Louis Universities Master's of Athletic Training Program. Under my tenure 22 MSAT students rotated through as of January 2015.
- Preceptor Saint Louis University Athletic Training Program.

Adjunct Professor August 2012-June 2015
Lindenwood University – Belleville, Belleville, IL

- Adjunct Professor in the CAATE accredited Athletic Training Program.
- Preceptor for Lindenwood University ATP.
- Classes Taught Included; Introduction to Athletic Training, Introduction to Athletic Training Lab, Kinesiology of Physical Education, Clinical Experience I, Assessment of Athletic Injuries Lower Body, Assessment of Athletic Injuries Lower Body Lab, Clinical Experience II, Assessment of Athletic Injuries Upper Body, Assessment of Athletic Injuries Upper Body Lab, First Aid/CPR/Sport Injuries, Medical Terminology, Football Experience, Therapeutic Exercise and Rehabilitation, and J-Term classes Introduction to Strength and Conditioning, Special Topics: Evidence-based medicine in Athletic Training.
- Advisor for Athletic Training and Exercise Science (2012-2014) majors at Lindenwood University – Belleville campus. Advised 60 students in Athletic Training major and 40 students in Exercise Science major each semester.
- Obtained integrated experience locations for future placement of athletic training students who needed to take Integrated Experience that began in August 2015.
- Lindenwood University – Belleville Athletic Training site coordinator for Lindenwood University CAATE site visit February 9-12, 2014. Site visit lead to re-accreditation with next site visit scheduled for 2018-2019.
- Prepared Lindenwood University – Belleville CAATE documents for Lindenwood University Athletic Training Program Director to include in CAATE self-study.
- Lindenwood University – Belleville Athletic Training Association club sponsor.

Athletic Trainer August 2016-Present
Memorial Hospital, Belleville, IL

- Part-time as needed athletic trainer.
- Provided care to Belleville West High School football and boys soccer teams during full-time athletic trainer's maternity leave.
- Provide athletic training services as needed to high schools contracted with Memorial Hospital, which have included Belleville East girls' volleyball tournament and Althoff Catholic High School Football Playoff game.

NFL ATC Concussion/Injury Spotter August 2014-May 2016
St. Louis NFL Market

- Secondary Spotter for the St. Louis, MO market.
- Observed, reported, and notified team medical personnel of potential player injuries from the Injury Video Review Booth.
- Tracked all potential injuries and team communications in a standard NFL ATC Spotter game report.
- Position was eliminated when the market team moved locations.

Assistant Athletic Trainer August 2004-May 2010
McKendree University, Lebanon, IL

- Assisted Head Athletic Trainer with coverage of 20 sports both men's and women's.
- Assisted Head Athletic Trainer in providing healthcare for approximately 420 student-athletes.
- Assisted Head Athletic Trainer in coordinating pre-participation physicals for 420 student-athletes.
- Assisted Head Athletic Trainer with maintenance of budget and inventory.
- Maintained student-athlete records.
- Assisted Head Athletic Trainer with insurance billing for athletic injuries.
- Assistant Athletic Trainer for men's football ('04 –'10) and women's basketball ('07 –'08).
- Primary Athletic Trainer for men's wrestling ('04 –'10) and men's baseball ('04 –'10).
- Designed strength and conditioning programs for wrestling, softball, and baseball teams.
- Supervision of Athletic Training Student as an approved clinical instructor.
- Other duties sssigned by the Head Athletic Trainer.

Associate Professor August 2004-May 2010
McKendree University, Lebanon, IL

- Associate Professor in the CAATE Athletic Training Education Program.
- Approved Clinical Supervisor for McKendree College CAATE Athletic Training Education Program.
- Classes taught included; Directed Observation, Evaluation and Assessment Clinical I, Evaluation and Assessment Clinical II, Evaluation and Assessment I Teaching Practicum, Concepts of Resistance Training, and CPR/AED/First Aid for the Professional Rescuer.
- Participated in CAATE site visit that lead to re-accreditation.

Athletic Trainer
Monroe Physical Therapy and Sports Medicine Aug 2005 – Nov 2008

- Provided high school football game coverage for the following high schools Red Bud 2008, Freeburg 2007, Columbia/Dupo 2006, and Dupo 2005.
- Evaluated injured athletes for both football and cheerleading.
- Provided pre-game care including taping, stretching, and bracing.
- Provided first aid to injured student-athletes and determined status to return to games.
- Provided recommendations based on environmental conditions ie. lightning and heat.
- Performed evaluations and treatments of student-athletes in clinic.

Athletic Trainer January 2005-Present
U.S. Youth Soccer Region II Olympic Development Program

- Region 2 Camp Head Athletic Trainer 2009-2012. Covered games and practices for over 1500 soccer players over 13 days. Ages ranged from U12-U18.

- Athletic Trainer for 2016 Interregional, Casa Grande, FL.
- Athletic Trainer for 2015 Interregional, Bradenton, FL.
- Athletic Trainer for 2014 Interregional, Casa Grande, AZ.
- Athletic Trainer for 2011 Interregional, Chula Vista, CA.
- Athletic Trainer for 2009 Interregional, Orlando, FL.
- Athletic Trainer for ’94 Age Group International Tour, Italy 2008.
- Athletic Trainer for ’90 Age Group International Tour, Costa Rica 2007.
- Athletic Trainer for ’91 Age Group International Tour, Argentina 2006.
- Athletic Trainer for 2006 Disney Interregional, responsible for ’90, ’92, and ’93 age groups (53 athletes).
- Athletic Trainer for ’87 Age Group International Tour, Portugal and Spain 2005.
- Athletic Trainer for ’88 Age Group International Tour, Spain 2004.
- Provided game and practice coverage for ’87, ’88, ’90, ’92, ’93, ‘94 Age Groups.
- Responsible for healthcare of 18 soccer players for international soccer trips.
- Provided support to team administrator in regards to safety and management of soccer team.
- Athletic Trainer for ’88 Age Group Chicago Fire MLS Tour 2005.
- Responsible for healthcare of 31 soccer players for Chicago Fire MLS Tour.
- Team administrator for ’88 Age Group Chicago Fire MLS Tour 2005.

Graduate Assistant Certified Athletic Trainer June 2003-June 2004
The Ohio University, Athens, OH

- Athletic Trainer for Division III Marietta College women’s soccer.
- Provided game and practice coverage for women’s soccer.
- Clinical Supervisor for Marietta College Student Athletic Trainers.
- Approved Clinical Instructor for The Ohio University’s Undergraduate Athletic Training Education Program.
- Teaching Assistant for The Ohio University’s Undergraduate Athletic Training Education Program.
- Research Assistant for The Ohio University’s Athletic Training Education Program.

High School Outreach Head Certified Athletic Trainer Feb. 2003-June 2003
Monroe Physical Therapy & Sports Medicine/ Waterloo High School, Waterloo, IL

- Provided game coverage for wrestling, boy’s basketball, and girl’s basketball.
- Provided first aid to high school student-athletes.
- Evaluated injured student-athletes.
- Performed rehabilitation to high school student-athletes at Physical Therapy Clinic.

RELATED EXPERIENCE

Athletic Trainer February 2015, 2016
Professional Bull Riders (PBR) Bass Pro Chute Out, St. Louis, MO

- Assisted tour’s AT’s in preventative and emergent care for professional bull riders.
- Arranged for Lindenwood University – Belleville Athletic Training Students to gain experience in providing care for PBR event.

Head Athletic Trainer April 2013 – April 2015
National Women’s Lacrosse League National Championships, Belleville, IL

- Host site for the 2013, 2014, and 2015 NWLL Championships.
- Provided coverage of 8 women’s lacrosse teams practices and games.
- Coordinated care for student-athletes participating in the Championships.
- Coordinated team physician care/availability for the Championships.
- Provided injury evaluation, prevention, treatment and rehabilitation for student-athletes.
- Communicated injuries and care to the coaches of the student-athletes.

Head Athletic Trainer March 2013
National Collegiate Wrestling Association Conference Championships, Belleville, IL
- Host site for the 2013 NCWA Great Lakes Conference Championships.
- Provided care for 6 mats and 23 teams during Championships.
- Coordinated care for student-athletes participating in the Championships.
- Coordinated team physician care/availability for the Championships.
- Provided injury evaluation, prevention, treatment and rehabilitation for student-athletes.
- Communicated injuries and care to the coaches of the student-athletes.

Head Athletic Trainer Nov 2007-April 2014
U.S. Youth Soccer Region II Olympic Development Program
- Assigned Certified Athletic Trainers to international events.
- Assigned Certified Athletic Trainers for U.S. events.
- Maintained contact information for Certified Athletic Trainers.
- Maintained medical kits for travel both within the U.S. and internationally.

Special Olympics Fall 2006
McKendree College, Lebanon, IL
- Assisted with set-up and design for Special Olympic Pre-Participation Physical Exams.
- Administer Pre-Participation Physical Exams.
- Coordinated volunteers to administer Pre-Participation Physical Exams.

Volunteer Athletic Trainer March 2005
NCAA Division I Wrestling Championships, St. Louis, MO
- Provided coverage for NCAA Division I Wrestling Championships.
- Assisted physicians in providing healthcare for NCAA Division I Wrestlers.
- Coordinated Athletic Training Student coverage of practices for NCAA Division I Wrestling Championships.

Volunteer Assistant Athletic Trainer August 2003-Nov. 2003
Columbus Crew, Columbus, OH
- Assisted Certified Athletic Trainer with day-to-day operations of athletic training clinic.
- Provided practice and game coverage for professional soccer team.
- Assisted in injury evaluation, prevention, and rehabilitation for professional soccer athletes.
- Interacted with Team Physicians, Chiropractor, Massage Therapist, and other Allied Health Professionals to provide high level care to the athletes.
- Assisted Head Athletic Trainer with Student Athletic Trainer supervision.

Physical Therapist Aide December 2002-June 2003
Monroe Physical Therapy & Sports Medicine, Waterloo, IL
- Carried full patient load of 18 patients daily.
- Assisted Physical Therapist with manual therapy.
- Prescribed and monitored patient rehabilitation exercises.
- Worked closely with patient's doctors and case managers.
- Maintained up-to-date medical records and rehabilitation notes of current patients.

Exercise Specialist May 1999-August 2008
The Training Room, Health and Fitness Center, Columbia, Waterloo, and Freeburg, IL
- Prescribed workouts to general population, high school, and college athletes.
- Performed physical assessments of health club members via body fat measurements, cardiovascular testing, strength testing, and flexibility testing.
- Supervised high school volunteers and fitness technicians.
- Maintained up-to-date files on current members.
- Designed and opened fitness center in Freeburg, IL October 2006.

RESEARCH

Dill, WE. *Exploring the Application of Learning Contracts to Athletic Training Board Certification Exam Preparation.* In progress.

Dill, WE, Herington, KM, Grieshaber, D. *Medial Meniscus Posterior Root Avulsion in the Male Athlete: A Case Study Report.* In progress.

Dill, WE, Seegmiller, JG. *Coarctation of Aorta in a Female Collegiate Soccer Player: A Case Report.* June 2004.

Hustedde, KM, Dill, WE. *The Effects of the use of a Mouthguard on Force Production*. June 2004.

ACTIVITIES/AWARDS

NAIA Athletic Trainer of the Year	Sept 2015
Southwest Conference Spine Management CEU Event Host	Aug 2015
NATA Doctoral Jeff Snedecker Memorial Scholarship	June 2015
Hope Christian Church Life Group Leader	Mar 2014 – June 2017
SIATA Last Chance CEU Event Coordinator	Dec 2013
SIATA Last Chance CEU Event Presenter "The Troublesome Psoas"	Dec 2013
Fellowship of Christian Athletes Coaches Huddle Leader	Aug 2013 – May 2015
National Athletic Trainers Association Grassroots Star of Week	Mar 2013
American Red Cross Lifesaver Community Award	Dec 4, 2009
Fellowship of Christian Athletes Coaches Huddle	Aug 2007 – June 2017
Hope Christian Church	Aug 2005 – June 2017

MEMBERSHIPS/COMMITEES

Lindenwood – Belleville Advising Committee	Oct 2016 – June 2017
NAIA Drug Testing and Education Committee	Oct 2016 – June 2017
Lindenwood – Belleville Recruitment Event Planning Committee	Sept 2016 – June 2017
Lindenwood University Promotions Committee	Sept 2016 – June 2017
IHSA Sports Medicine Advisory Committee	Dec 2015 – June 2017
Lindenwood University Faculty Council	Jun 2015 – June 2017
NAIA Council for Student-Athletes Committee	May 2015 – June 2017
Illinois Athletic Trainers Association Region 4 Representative	Nov 2014 – June 2017
Illinois Athletic Trainers Association BOD member	Nov 2014 – June 2017
NAIA Athletic Training Education Committee Chair	Jun 2014 – June 2017
Illinois Athletic Trainers Association Young Professionals Committee	Oct. 2011 – Mar 2012
Clinical Education Advisory Committee for the SLU ATEP	Mar 2011 - May 2015
National Strength and Condition Association Member	Mar 2004 – August 2012
Illinois Athletic Trainer Association Member	Dec 2002 - Present
Great Lakes Athletic Trainer Association Member	Dec 2002 - Present
National Athletic Training Association Member	Dec 2002 - Present

CERTIFICATIONS/LICENSURES/ACCREDITATIONS

Missouri Licensed Athletic Trainer	Jul 2015 - Present
American Red Cross Oxygen Administration Certification	Aug 2014 – Present
Preceptor Lindenwood University Athletic Training Program	Jul 2012 - Present
Preceptor Saint Louis University Athletic Training Program	Jul 2011- 2016
Graston M1 Accreditation	Jul 2011- Present
American Red Cross Bloodbourne Pathogens Instructor	May 2005 - Present
American Red Cross First Aid Instructor Certification	May 2005 - Present
Certified Strength and Conditioning Specialist	May 2004 - Present
American Red Cross CPR/AED Pro. Rescuer Instructor Certification	Mar 2004 - Present
American Red Cross CPR/AED Professional Rescuer Certification	Mar 2004 - Present
American Red Cross First Aid Certification	Feb 2004 - Present
Automated External Defibrillator Certification	Mar 2004 - Present
Ohio Licensed Athletic Trainer	Jun 2003 - June 2004
Illinois Licensed Athletic Trainer	Feb 2003 - Present
BOC Certification	Feb 2003 - Present