

Illinois State University

ISU ReD: Research and eData

---

Theses and Dissertations

---

12-1-2021

## Athletic Training Clinical Education Assessments: An Exploration of the AT Milestones

Chelsey Bruns

*Illinois State University*, [chelsey.b.myers@gmail.com](mailto:chelsey.b.myers@gmail.com)

Follow this and additional works at: <https://ir.library.illinoisstate.edu/etd>

---

### Recommended Citation

Bruns, Chelsey, "Athletic Training Clinical Education Assessments: An Exploration of the AT Milestones" (2021). *Theses and Dissertations*. 1518.

<https://ir.library.illinoisstate.edu/etd/1518>

This Dissertation is brought to you for free and open access by ISU ReD: Research and eData. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of ISU ReD: Research and eData. For more information, please contact [ISUREd@ilstu.edu](mailto:ISUREd@ilstu.edu).

ATHLETIC TRAINING CLINICAL EDUCATION ASSESSMENTS:  
AN EXPLORATION OF THE AT MILESTONES

CHELSEY BRUNS

86 Pages

Athletic training is an evolving and growing allied health profession. With recent changes in educational degree requirements and standards, many athletic training programs are reviewing current assessments. The AT Milestones project was developed to provide programs with a guide for student assessment within athletic training education programs (ATEPs). While these Milestones have slowly been implemented into select ATEPs, there is currently no published empirical research on the application of the AT Milestones in athletic training education. The purpose of this study was to examine athletic training educators' perceptions of current clinical evaluations, and program evaluations' alignment to the principles of the AT Milestones. The survey had a response rate of 13.2%. Overall, faculty including program directors and clinical coordinators were satisfied or very satisfied with their current clinical evaluations. The majority of respondents reported that they had a general understanding of the AT Milestones (50%). Programs seeking accreditation or in good standing were more likely to have made or are planning to make revisions to clinical evaluations and were more likely to implement the AT Milestones than those programs voluntarily withdrawing. The average AT Milestones Alignment Criteria Score (ATMACS) among the participating institutions was 55%, indicating an average alignment with the AT Milestones. This research seeks to contribute to the limited literature base

on clinical assessments in athletic training and serve as a guide for administrators in developing clinical evaluations that best fit the needs of their respective programs.

**KEYWORDS:** athletic training, education, clinical evaluations, AT Milestones

ATHLETIC TRAINING CLINICAL EDUCATION ASSESSMENTS:  
AN EXPLORATION OF THE AT MILESTONES

CHELSEY BRUNS

A Dissertation Submitted in Partial  
Fulfillment of the Requirements  
for the Degree of

DOCTOR OF EDUCATION

School of Teaching and Learning

ILLINOIS STATE UNIVERSITY

2022

Copyright 2022 Chelsey Bruns

ATHLETIC TRAINING CLINICAL EDUCATION ASSESSMENTS:  
AN EXPLORATION OF THE AT MILESTONES

CHELSEY BRUNS

COMMITTEE MEMBERS:

Steven B. Mertens, Chair

Allison Antink- Meyer

Jay Percell

Justin Stanek

## ACKNOWLEDGMENTS

I want to dedicate this dissertation my family and friends. Thank you for your continued support and unwavering faith in me. This life is a blessing, and I am thankful every day to share it with you. I would like to express my sincere gratitude to Illinois State University for helping me fulfill a lifelong dream in earning a doctorate degree. I would like to thank both the Teaching and Learning Program and the Athletic Training Department for giving me the opportunity to grow as a student and professional during my time at the university. To my committee, Dr. Steven Mertens, Dr. Allison Antink-Meyer, Dr. Jay Percell, and Dr. Justin Stanek, I am beyond grateful for your mentorship and continued support. To my fellow cohort students, thank you for sharing this once and a lifetime experience with me, may we all find our purpose and get to work. To my loving partner Scott, thank you for challenging me, balancing me, and reminding me of my strengths... and for explaining education lingo to me the whole first year ☺ To my Kali girl, we've been together through it all, our daily walks feed my soul and keep me going every day. Most of all, I am beyond grateful to Dr. Steven Mertens, my chair, for his guidance, crazy organizational skills, SPSS wizardry, and continued confidence in me. In times of self-doubt, you reminded me of my capabilities and gave me direction. Thank- you.

“The future belongs to those who believe in the beauty of their dreams”

- Eleanor Roosevelt

C.B.

## CONTENTS

	Page
ACKNOWLEDGMENTS	i
TABLES	iv
FIGURES	v
CHAPTER I: INTRODUCTION	1
CHAPTER II: REVIEW OF LITERATURE	6
Theoretical Background	10
The Milestones	12
Assessment in Athletic Training Clinical Education	15
Milestones: The Potential Impact	22
Statement of Problem	28
CHAPTER III: METHODOLOGY	29
Research Questions	29
Hypotheses	29
Research Design	30
Participants	33
Instrumentation	34
Questionnaire Design	36
Pilot Testing	39
Data Analysis	40
Quantitative Data Analysis	41
Qualitative Data Analysis	43



Data Merging	47
Significance of Study	47
CHAPTER IV: RESULTS	49
Research Questions	49
Data Results	49
Research Question 1	50
Research Question 2	56
CHAPTER V: DISCUSSION	58
Limitations	63
Recommendations for Future Research	64
Conclusions	65
REFERENCES	67
APPENDIX A: AT MILESTONES QUESTIONNAIRE	77
APPENDIX B: PARTICIPANT CONSENT FORM	80
APPENDIX C: VALUE RECORDED RESPONSES	82
APPENDIX D: BENEFITS AND DRAWBACKS RECORDED RESPONSES	84
APPENDIX E: AT MILESTONES ALIGNMENT CRITERIA SCORE	86

## TABLES

Table	Page
1. CAATE 2020 Standards: Core Competencies	8
2. CAATE 2020 Core Competency Standards Examples	9
3. General Description of the AT Milestones Levels (Holmboe et al. 2016)	13
4. Table of Specifications for Survey Instrument	37
5. Procedures and Data Analyses Crosswalk Table	41
6. AT Milestones Criteria List	46
7. Demographics of the Study Participants	49
8. Information Reported as Most Valuable in Clinical Evaluation Assessments	53
9. Benefits and Drawbacks of Using a Milestones-based Assessment	56
10. AT Milestones Alignment Criteria Score – ATMACS	57

## FIGURES

Figure	Page
1. Program Assessment Loop (Kahanov & Eberman, 2010)	16
2. Overall Satisfaction of Current Clinical Evaluations	51
3. Program Status Influence on Assessment Revision Plans	52
4. Participant Role Influence on AT Milestones Understanding	54
5. Program Status Influence on Use of AT Milestones	55

## CHAPTER I: INTRODUCTION

Athletic training is a rapidly growing and evolving allied health profession. Having been compared to the Swiss army knife of healthcare, athletic trainers have the ability to work in a variety of settings and diverse populations (National Athletic Trainers' Association, n.d.).

Athletic trainers take courses in general medical conditions, emergency medicine, in addition to the evaluation and treatment of orthopedic injuries. As health care professionals, ATs have a broad knowledge of the medical field allowing them to be versatile in employment settings and working with unique patient populations. While historically athletic trainers have predominantly been seen working with athletic populations, more recently athletic trainers have established opportunities working alongside physicians in hospital settings, in factories as industrial athletic trainers, and behind the scenes in performing arts. Because of the wide variety of patient populations, it is important for students to be exposed to immersive experiences through clinical practice.

Like many healthcare professions, athletic training requires students to participate in practical experiences as a component of their academic program. Clinical education seeks to integrate didactic knowledge with professional preparation through practical application of skills (Edler et al., 2017). Athletic training education encompasses a wide variety of domains that can be practiced and refined by students in the clinical setting. Currently, athletic training education is addressing changes in standards and degree requirements to enhance coalition with other allied health professions and gain recognition (Perrin, 2015).

In 2015, the governing bodies in athletic training announced the decision to move all future athletic training education to the graduate level, effective after the fall 2022 semester (CAATE, 2018). This decision requires programs to have implemented and transitioned from a

bachelor's degree to a professional master's degree in athletic training (MAT). Athletic training education at the graduate level calls for a higher degree of critical thinking for the purpose of progressing the profession forward (Geisler & Lazenby, 2009). As athletic training changes with the growing demands in healthcare, educational programs have adapted to meet those needs. However, it is still unclear if the current assessments being used in clinical education are what is best for the profession moving forward. The degree change offers athletic training education programs with the opportunity to explore new clinical education evaluation and assessment measures.

As athletic training education transitions to a graduate program, there is a need to review current evaluation methods used in clinical education. In recent years a group has begun working collaboratively with educational programs to develop the Athletic Training (AT) Milestones Project. This working group was made up by academics in athletic training education including program directors, residency managers, and clinical coordinators. The AT Milestones were designed to enhance and facilitate assessment of students and residents during their participation in athletic training education programs (Athletic Training Milestones Project, n.d.). Currently, the AT Milestones have been implemented in a few select athletic training residency programs nationally (Athletic Training Milestones Project, n.d.). However, there is limited research on the application of those Milestones in athletic training clinical education.

Within the profession, there are multiple national stakeholders that have an influence on both assessments and program accreditation (Cavallario et al., 2018; Moffit et al., 2016). The Commission on Accreditation of Athletic Training Education (CAATE) and the Board of Certification (BOC) have mandated that accredited programs provide evidence to support student outcomes along with data to maintain compliance with standards (CAATE, 2018). The *CAATE*

*2020 Standards Guide* (2018) address the need to evaluate students through the use of formative and summative assessments (CAATE, 2018). The guide has indicated that each program should have an assessment plan that includes collecting information on the quality of instruction (didactic and clinical), quality of clinical education, student learning, and overall program effectiveness (CAATE, 2018 p. 38). While CAATE requires programs to have an assessment plan, currently there is no required standardized clinical education assessment instrument (CAATE, 2018).

Previous research has criticized clinical evaluations instruments for being an unreliable method of assessing student performance and proficiency during clinical education (E. S. Holmboe et al., 2010; Thompson et al., 2014; Turnbull et al., 2000). Clinical evaluation instruments are at risk for measurement errors that are a result of leniency-bias, lack of framework, training, and score inflation (Pangaro & ten Cate, 2013). Previous research by Ambegaonkar et al. (2012) investigated the relationship between student and clinical instructor ratings using an athletic training performance assessment. The findings indicated that clinical instructors may overestimate performance of athletic training students regarding overall performance and the assigned clinical grade. Schilling (2012) noted that the purpose of summative clinical assessments is meant to ensure that students have achieved an acceptable, pre-determined level of competence in the necessary domains before completion of the program. However, creating quality instruments that are feasible and reliable for measuring competence can be challenging (Schilling, 2012).

Clinical evaluation instrument research in athletic training continues to be limited. The AT Milestones project seeks to provide programs with a more comprehensive guide to assessment development. Research on Milestones-based assessments from graduate medical

education shows promise (Dzara et al., 2019; Friedman et al., 2014; Gardner et al., 2015; Kuo et al., 2015). In 2015, the Accreditation Council of Graduate Medical Education (ACGME) began implementing Milestones-based evaluations into all accredited medical residency programs (E. Holmboe et al., 2016).

Several studies have compared traditional and milestones-based evaluation instruments in medical residency programs. Findings from Friedman et al. (2014), Gardner et al. (2015), and Kuo et al. (2015) found that Milestones-based assessments provided more detailed and valuable feedback for students by providing specific content areas for competency development. Additionally, the Milestones-based assessments showed greater differentiation in scores among classes of residents, and were able to reduce the ceiling effect in assessment (Friedman et al., 2014). While many residency programs saw a benefit in transitioning to Milestones-based evaluations, many programs faced challenges. Dzara et al. (2019) reported that program leaders, while seeing the potential benefit of the Milestones, were frustrated in attempting to adapt and implement them into practice. As athletic training education transitions to the graduate degree, many programs adopting the AT Milestones will likely face similar challenges.

The purpose of this study was to examine athletic training educators' perceptions of current clinical evaluation assessments, and program evaluations' alignment to the AT Milestones. This study used a mixed methods research design to evaluate the perceptions of athletic training faculty about current clinical evaluation assessments and the AT Milestones, as well as evaluate how current clinical evaluations align with the AT Milestones.

Participants in this study were athletic training education program directors (PDs) and clinical education coordinators (CECs). These faculty members are in the most appropriate positions to have knowledge of current clinical evaluations, changes in program assessments, and

an understanding of the AT Milestones project. For this investigation, a questionnaire was developed and distributed to the athletic training program faculty across the country for participation. The questionnaire included close-ended and open-ended questions to facilitate an understanding of the respondent's beliefs and attitudes towards clinical evaluation and the AT Milestones. In addition to the questionnaire, respondents were asked to voluntarily submit a copy of their program's current clinical evaluations. These documents were analyzed to assess the clinical evaluations' association to AT Milestones concepts.

The transition of athletic training education to the graduate level and updates to the CAATE standards, will require a review of the evaluation methods currently being implemented. The AT Milestones have the potential to be a reliable and valuable instrument for assessing students' competency during clinical experiences. To date, there has been no published literature on the use of the AT Milestones in athletic training education. It is important to examine the current climate of assessment and evaluation in athletic training clinical education. This research served as an initial investigation into faculty's understanding, use, and intentions for implementing the AT Milestones. Additionally, this study examined current clinical evaluations and how they relate to the principles of the AT Milestones.

The purpose of this dissertation study was to examine athletic training educators' perceptions of current clinical evaluation assessments, and program evaluations' alignment to the AT Milestones. The study sought to address the following research questions:

1. What are the perceptions of athletic training faculty about current clinical evaluation assessments and the AT Milestones?
2. How do clinical evaluation assessments of current athletic training education programs align with the AT Milestones?



## CHAPTER II: REVIEW OF LITERATURE

Athletic training is an allied health profession recognized by the American Medical Association and is responsible for the health and care of active individuals (Perrin, 2015). Athletic trainers work in a variety of health care settings with diverse populations of people ranging from youth athletes to military personnel, and industrial laborers. Athletic training education is currently addressing changes in educational standards and degree requirements to better align with other allied health professions and gain recognition as a viable option for healthcare (Perrin, 2015).

The existing model for athletic training education in the United States has been comprised of two primary components including professional education at the bachelor's level and post-professional education at the graduate degree level (National Athletic Trainers' Association Work Group on Professional Education in Athletic Training, 2013). Currently, the course of study for a student to become an athletic trainer is to graduate from an institution accredited by the Commission on Accreditation of Athletic Training Education (CAATE) and successfully complete the Board of Certification Exam (BOC). The requirement to become an entry-level athletic trainer can be completed at both the undergraduate and graduate level at one of the hundreds of accredited bachelor's programs or professional masters of athletic training (MAT) degree programs in the United States (CAATE, n.d.b). In 2015, the Athletic Training Strategic Alliance, the governing body in athletic training, announced the decision to move all future athletic training education to the master's degree level. In the coming years, all athletic training education programs will be required to have implemented and transitioned to the graduate level (MAT) program (Athletic Training Strategic Alliance, 2015).

This decision came after a long-debated conversation about the promotion of the profession (Perrin, 2015; Pitney, 2012; Prentice, 2013). The Athletic Training Strategic Alliance (2015) stated that due to the changing state of health care and higher education, a change in degree will be necessary for the future and longevity of the athletic training profession. Factors leading to the decision included the evolving landscape of health care delivery, scope of practice for working athletic trainers (Aths), a need for greater depth of knowledge, and the increasing demand for accountability (NATA Work Group on Professional Education in Athletic Training, 2013; Perrin, 2015). Before the announcement was made, a critical analysis of the degree level for athletic training was prepared and reported to the NATA Board of Directors. This report is most commonly known as the White Paper on Professional Education (NATA Work Group on Professional Education in Athletic Training, 2013). The key findings of this report recommended that the transition to graduate professional education would better facilitate education programs that align with other health care profession programs (e.g., physical therapy, occupational therapy, nursing, physician assistant). In addition, graduate education requirements would better reflect the clinical practice demands of both current and future athletic trainers (NATA Work Group on Professional Education in Athletic Training, 2013).

CAATE serves as the accrediting body for athletic training education programs (ATEPs) across the U.S. and is responsible for defining and ensuring quality education in athletic training to promote and enhance clinical practice (CAATE, n.d.a). In addition to mandating changes in accreditation for programs and the degree level, CAATE has established new standards to align with graduate level education (CAATE, 2018). These standards outline best practices for program design, delivery, and quality. Additionally, the CAATE standards frame the curricular

content for ATEPs including the core competencies for admitted students. See Table 1 (CAATE, 2018).

**Table 1**

*CAATE 2020 Standards: Core Competencies*

- 
- Patient-Centered Care
  - Interprofessional Practice & Interprofessional Education
  - Evidence-based Practice
  - Quality Improvement and Assurance
  - Health Care Informatics
  - Professionalism
  - Patient Care
    - Care Plan
    - Examination, Diagnosis, & Intervention
  - Prevention, Health Promotion, & Wellness
  - Health Care Administration
- 

The 2020 CAATE standards provide the minimum academic requirements for programs to maintain compliance, though programs are encouraged to be innovative and exceed these standards. For examples of CAATE 2020 core competency standards, see Table 2 (CAATE, 2018). These core competency standards relate to the content and foundational knowledge needed for students' successful completion of the program, and eligibility to sit for the BOC (CAATE, 2018). Athletic training, like many allied health care fields, requires students to participate in practical applications of knowledge as a component of clinical education. Edler et al. (2017), defined clinical education as a student's integration into professional preparation through formal practice and evaluation of clinical proficiencies, as well as, applied experiences in health care environments. Clinical education is an essential component to the learning-over-time process needed in health care education (Schilling & Koetting, 2010).

**Table 2**

*CAATE 2020 Core Competency Standards Examples*

---

Standard 58	Incorporate patient education and self-care programs to engage patients and their families and friends to participate in their care and recovery.
Standard 74	Educate patients regarding appropriate pharmacological agents for the management of their condition including indications, contraindications, dosing, interactions, and adverse reactions.

---

With the changes in CAATE standards, there is a need to re-examine the current evaluation methods used in athletic training clinical education. In recent years, a group has begun working collaboratively with educational programs to develop the Athletic Training (AT) Milestones Project ([Athletic Training Milestones Project, n.d.](#)). This working group was made up of academics from the athletic training community including program directors and residency coordinators. The AT Milestones were designed to enhance and facilitate assessment of students and residents during their participation in athletic training education programs ([Athletic Training Milestones Project, n.d.](#)). Adapted from the Accreditation Council for Graduate Medical Education (ACGME) Milestones, the AT Milestones have been developed to capture and assess the essential knowledge, skills, attitudes, and behaviors needed in athletic training ([Athletic Training Milestones Project, n.d.](#)). Currently, the AT Milestones have been implemented in a few select residency programs nationally ([Athletic Training Milestones Project, n.d.](#)). However, there is limited research on the application of the AT Milestones in athletic training clinical education.

The purpose of this literature review is to examine the historical and theoretical contexts of athletic training education assessment. Additionally, this review will explore current research in the topic of ACGME Milestones, and possible implications for their application in athletic training education.

## **Theoretical Background**

It is important to recognize the concepts of competency-based education as they relate to the introduction and the role of the AT Milestones in assessment for athletic training and medical education. Competency-based education (CBE) and competency-based medical education (CBME) provide key theoretical backgrounds for the development, implementation, and evaluation of the AT Milestones Project.

Competency-based education has been a revolving trend in education, dating back to the 20<sup>th</sup> century (Garfalo & L'Huillier, 2016; Gervais, 2016; Nodine, 2016). In recent years, CBE has made a reissuance as education in the United States pushes for accountability and affordability . While historically CBE has been associated with vocational learning, in the last several years it has represented a paradigm shift and continues to gain traction in higher education (Garfalo & L'Huillier, 2016; Nodine, 2016). Having been viewed from multiple lenses across decades and disciplines, CBE has a wide variety of interpretations that has made it difficult to clearly define. It has been loosely defined in the literature as adaptive, performance-oriented, flexible, and accountable for outcomes (Garfalo & L'Huillier, 2016; Gervais, 2016; Nodine, 2016). Other terms used to describe CBE in the literature include: problem-based learning, mastery-based learning, and outcome-based learning (Nodine, 2016). Based on a working construct of CBE, Gervais (2016) defined competency-based education, as an outcome-based approach to education that incorporates modes of instructional delivery and assessment efforts designed to evaluate mastery of learning by students through their demonstration of knowledge, attitudes, values, skills and behaviors required for the degree sought.

In a CBE program, curriculum is developed and designed by working backwards from a desired outcome (Gervais, 2016). What makes these programs unique from traditional

approaches is the de-emphasis of time and the flexibility of the individual student as a learner. While CBE and traditional education programs are both considered outcome based, the ways of assessing the student and determining mastery of content are distinctive (Garfolo & L’Huillier, 2016). A student demonstrates competency and readiness to progress in content when they have demonstrated the knowledge, skills, values, and behaviors through identified competencies (Gervais, 2016).

Many modern ideas of competency-based education came from the professional education movement that placed a significant emphasis on the preparation for careers and professions (Bloom, 1968; Nodine, 2016; Tyler, 1976). One theorist, Ralph W. Tyler, stressed the importance of learning theoretical foundations for student to best understand how to apply learning to their respective professions (Gervais, 2016). From Tyler’s principles of learning objectives came Benjamin Bloom’s taxonomy of cognitive learning objectives (Bloom et al., 1956). This taxonomy was developed to classify the varying levels of cognitive skills for learners. The use of Bloom’s Taxonomy encourages instructors to create learning objectives that consider what learners are able to demonstrate because of the instruction (Bloom et al., 1956). Additionally, it includes learning objectives that require higher levels of cognition and deeper learning that can be applied to a variety of contexts. Bloom’s taxonomy has been used as a reliable mechanism for development through graduate medical education programs (Kothari et al., 2017). Graduate medical education and residency programs have been some of the first to adopt principles of CBE models, more commonly known in the field as CBME.

In most medical education programs, competency-based medical education principles continue to work in a hybrid model in that competency and outcomes-based approaches are implemented in a fixed context of training years for students (Holmboe et al., 2016). CBME

principles are primarily employed in the development of resident assessments. In a review of literature on CBE in medical education, Morcke (2013), noted how the adoption of competency-based principles were linked to the increase in public concern for patient satisfaction. In a 2010 Carnegie Foundation's Flexner report (Cooke et al., 2010), it was noted that medical education programs lacked defined outcomes and minimum competencies that could potentially risk patient safety and health.

From this report (Cooke et al., 2010), it was recommended that assessments be developed to determine which benchmarks learners had reached and to develop standards of competence for medical students. In response to public concerns, the ACGME continues to shift medical and health care education to a CBME approach specifically in the designing and implementing of assessments to determine student competency (Holmboe et al., 2010; Mace & Welch, 2019; Morcke et al., 2013). Hence, the ACGME announced six core competencies or areas in which medical professionals (residents) should be competent before entering the workforce as independent clinicians (Holmboe et al., 2016; E. S. Holmboe et al., 2010; Mace & Welch, 2019). These six General Competencies are known as the ACGME Milestones (Holmboe et al., 2016).

### **The Milestones**

In 1999 the six General Competencies for medical residency were developed and endorsed by the ACGME, with Milestones reporting beginning in 2013 (Holmboe et al., 2016). Today, all specialties and sub-specialties report Milestones data through individual assessments collected in each residency program (Holmboe et al., 2016). The ACGME Milestones Guide (2016) describes the Milestones as narrative descriptors of competencies and sub-competencies based on a developmental continuum (see Table 3). These Milestones describe the level of performance a resident or fellow is expected to demonstrate in knowledge, behavior, and skill

under the six General Competency domains (Holmboe et al., 2016). While the framework is designed to guide program leaders in developing assessments, it is not meant to act as a curriculum, or an assessment instrument alone (Holmboe et al., 2016). It is suggested that the Milestones be used to inform and develop assessment instruments that align with the program’s specific goals, and be used to identify gaps in the current curriculum (Holmboe et al., 2010).

The Athletic Training (AT) Milestones are an adaptation of the ACGME Milestones specifically designed for the use in CAATE accredited athletic training education programs, residencies, and fellowships (Athletic Training Milestones Project, n.d.). The AT Milestones use the ACGME six general competencies along with eight specialty competencies specific to athletic trainers’ scope of practice. It is recommended that individual programs determine the frequency in which they use the AT Milestones to assess student performance (Athletic Training Milestones Project, n.d.). Currently, it has been recommended to programs transitioning to the MAT to consider implementing the AT Milestones into student assessments. However, no formal mandate from CAATE is being required at this time (Athletic Training Milestones Project, n.d.).

**Table 3**

*General Description of the AT Milestone Levels (Holmboe et al., 2016)*

Level 1	Level 2	Level 3	Level 4	Level 5
What are the expectations for a beginning student?	What are the milestones for a student who has started to advance, but is performing at a level lower than expected?	What are the key milestones at this point?  What should they be able to demonstrate?	What does a graduating student look like?  What knowledge, skills and attitudes have they acquired?  Are they ready for certification?	What does an aspirational student look like?  How do they go above what is expected?



### ***Theoretical Framework for Assessment***

The goal of any athletic training education program is to develop student into prepared and quality practitioners entering the field. To evaluate if a program is successful, it is essential that program goals are established to drive the creation of curriculum, assessment, and the intended learning outcomes for student in the program (Pangaro & ten Cate, 2013). Traditionally, education in allied health including physical therapy, nursing, and athletic training have depended on experiential learning through patient interaction and time in the clinical setting (Cavallario et al., 2018). Because patient interactions are an essential part of the learning experience and developing competence, the need for student assessment in the clinical setting continues to grow (Cavallario et al., 2018; Kahanov & Eberman, 2010; Pangaro & ten Cate, 2013).

Like many health care professions, athletic training education continues to move toward CBE instruction, which relies on sequential learning and the demonstration of competence in the domains, When developing assessment instruments, it is important to have a framework that reflects the process in which students learn (Pangaro & ten Cate, 2013). *The AMME Guide to Theories in Medical Education* (Pangaro & ten Cate, 2013) published by the Association for Medical Education in Europe, provides a detailed outline for the use of assessments in medical training. This guide defines the use of analytic, synthetic, and development frameworks commonly used in the medical field by health care educators. While many assessments are hybrids of different frameworks, it is important the components accurately reflect the goals of the program and align with the learning process. The ACGME Milestones are an example of a developmental model that has been implemented in medical education since 2015 (Holmboe et

al., 2016). These Milestones continue to evolve as more data is reported, literature is produced and feedback from stakeholders is provided (Holmboe et al., 2016).

### **Assessment in Athletic Training Clinical Education**

A program's success is often measured through the accomplishments and achievements of their students. But how this success is measured can be difficult for educational programs. What defines success within a program? Every educational program needs to have a plan for success that aligns with the shared mission and values of the university (Eberman & Kahanov, 2011). An athletic training education program's mission and goals serve as the framework for all aspects of the program (Dodge et al., 2009). Therefore, defining a mission is an important step before a program can develop goals, outcome measures, and assessments (Moffit et al., 2016). Kahanov and Eberman (2010), Eberman and Kahanov (2011), and Moffit et al. (2016) recommended the use of an assessment loop to outline program goals, measures, and outcomes.

This assessment loop should include the program's goals, methods for gathering evidence, interpretation of the data collected, and analysis for how programs will use this information (see Figure 1) (Eberman & Kahanov, 2011; Kahanov & Eberman, 2010). Critical components of this loop are the development of measurements to provide program directors and faculty with valuable data that can be used for improvements across the program (Eberman & Kahanov, 2011; Holmboe et al., 2010; Kahanov & Eberman, 2010).

**Figure 1**

*Program Assessment Loop (Kahanov & Eberman, 2010)*



Competency-based education has been seen as one solution to creating assessments that precisely evaluate student progress throughout an educational program. Curry and Docherty (2017) stated that professional and technical schools frequently use the term “competencies” to relate to adequate professional performance. For accreditation, student acceptance, and retention the emphasis on objective measurements of knowledge and skill continue to gain momentum in allied health professions (Edler et al., 2017; Schilling & Koetting, 2010). Competencies consist of behavioral objectives that are commonly grouped within domains (Schilling & Koetting, 2010). The field of athletic training currently has six domains, including: (a) injury and illness prevention, (b) clinical evaluations and diagnosis, (c) immediate care, (d) treatment and rehabilitation, (e) administrative roles, and (f) professional responsibility (National Athletic Trainers' Association, n.d.).

Competency-based education is focused on a model of organization that aims at desired endpoints or outcomes for graduates (Curry & Docherty, 2017). When learning goals and student outcomes are clear and organized in a CBE model, a framework is created for all stakeholders to benefit. Used effectively, CBE has the ability to improve student outcomes by working toward

goals linking to professional practice. This process of learning can provide the need for quality feedback in clinical education (Holmboe et al., 2010).

A 2017 study by Bowman et al. examined students' experiences in masters of athletic training programs to determine what aspects were influential in preparing them for practice as clinicians. Participants responded to an online survey with a series of open-ended questions addressing the structure and curriculum within the individual's respective MAT program. Clinical education was determined to be the major identifier for MAT students' preparation for transition into practice. In this clinical education theme, diverse and immersive clinical experiences were identified as being factors that helped students feel prepared to provide quality care (Bowman et al., 2017). Both faculty and students indicated that mentorship from program faculty and preceptors helped promote the transition from student to clinician (Bowman et al., 2017). This study demonstrated the importance of clinical and experiential learning plays in preparing students to become effective practitioners. Clinical assessments can provide the feedback needed to develop those quality experiences for students in athletic training.

Students in athletic training programs complete several clinical rotations before successful program completion. These clinicals often coincide with coursework in the athletic training education program. To reflect the developmental nature of the program, it is possible there will need to be different Milestones assessment instruments that align with the developmental stages throughout the program. The *CAATE Implementation and Guide to the CAATE 2020 Professional Standards* (2018), indicates that accredited programs' clinical experience should provide a logical progression of increasingly complex and autonomous patient-care and client-care experiences (p. 8). To assess that these standards are being met,

CAATE has recommended using patient encounter tracking and clinical performance evaluations.

Cavallario et al. (2018) examined the relationship between patient encounters in the clinical setting and how students were integrating core competencies. Participants, including preceptors and athletic training students were asked to track students' patient encounters and how many core competencies were completed in each encounter. Based on recordings, students implemented approximately four core competencies during each patient interaction. Students who assisted preceptors in the encounters were more likely to complete core competencies compared to those students who only observed or performed the encounter alone. These findings of this research indicate the importance of the preceptor's role in introducing, reinforcing, and evaluating core competencies in patient encounters with students. Assessment instruments can be used to provide programs with valuable information about the quality of clinical experiences and how students are implementing course knowledge into daily practice.

Previous research has criticized clinical evaluations for being unreliable and invalid methods of assessing student performance and competence during clinical education (E. S. Holmboe et al., 2010; Thompson et al., 2014; Turnbull et al., 2000). However, clinical evaluations have the potential to fulfill multiple roles in accountability. From a student perspective, evaluations provide transparent feedback for improving skills; from a programmatic view, it fulfills the responsibility of the institution to ensure students have met an expected performance level (Turnbull et al., 2000).

Thompson et al. (2014), stated that most performance evaluations in athletic training education can be classified into either behavioral or holistic approaches. In a behavioral approach, student expectations are clearly defined and there is little discrepancy in what is

considered satisfactory performance. This type of assessment assumes that standardization removes bias and therefore can be measured objectively. Whereas, holistic approaches integrate professional judgement and have the ability to acknowledge that there are multiple solutions to given problems. Because holistic assessments lack simplicity and clearly defined measures, they can make evaluation more challenging (Thompson et al., 2014). The Milestones would be an example of a hybrid between holistic and behavioral approaches, in that they look globally at the competencies of an AT but evaluates observable knowledge and skill (Holmboe et al., 2016).

Developing a clinical assessment framework that provides utility for program evaluation and supports the educational goals of the program will advance athletic training education (Thompson et al., 2014). Traditional reliability and validity requirements for assessments are not easily met regarding clinical education (Pangaro & ten Cate, 2013). Because clinical assessments can only be considered valid if they provide support to their interpretation and meaning, developing a valuable instrument is needed in athletic training (Thompson et al., 2014).

Clinical educators (i.e. preceptors) can be seen as a vulnerable link in the clinical assessment process (Pangaro & ten Cate, 2013; Thompson et al., 2014; Turnbull et al., 2000). Clinical educators responsible for clinical assessment differ between clinical sites with varying degrees of role strain (Pangaro & ten Cate, 2013; Thompson et al., 2014). Often, this measurement error is seen in leniency-bias and is frequently the outcome of several factors including, a lack of framework, training, or predefined notions of students from years of experience (Pangaro & ten Cate, 2013). This can then result in score inflation and rating students too highly, leading to a depreciation of standards over time (Pangaro & ten Cate, 2013). Holmboe et al. (2016), stated that it is important to recognized that it is the individual completing the assessment tool (e.g. a faculty member or preceptor) who serves as the measurement

instrument, not the tool itself. Time needs to be dedicated to preparing these clinical educators not only to teach students, but also on evaluation needs and expectations (Holmboe et al., 2016; Thompson et al., 2014).

Ambegaonkar et al. (2012) investigated the relationships between approved clinical instructors' (preceptors) ratings of students specific clinical performance, overall clinical performance, and clinical grade. This study used the Athletic Training Specific Performance Inventory (ATCPI) to assess students' specific and overall clinical performances across four academic years. The ATCPI used a 21-item instrument designed to be an athletic training specific assessment of student clinical performance. The ATCPI was comprised of several items that rated students on AT specific skills (e.g. clinical evaluation, diagnosis), as well as items rating overall performance (e.g. professionalism, communication, interactions). The instrument also solicited open feedback and asked preceptors to assign students a clinical letter grade. Results from this study found no significant differences were noted between students' *specific* clinical performance and assigned *clinical grade*. This finding may indicate that preceptors' observations of specific clinical performance was accurately reflected in the students' clinical grade. However, the *overall* clinical performance ratings from preceptors were significantly higher in relation to their ratings of *specific* clinical performance and to the assigned *clinical* grades. Therefore, preceptors may be overestimating overall performance (Ambegaonkar et al., 2012). The authors noted that this leniency in overall performance ratings could be contributed to an emotional attachment between the preceptor and the student. Preceptors may be uncomfortable with confronting students concerning clinical performance, or the preceptor may have a positive or negative relationship that may influence their scoring on the ATCPI.

An instrument limitation of this study was the limited validity testing prior to implemented and collecting data. The authors noted that while the ATCPI was based on a professional development assessment, the research team was only able to establish face validity for the instrument. Additionally, this study would be challenging to replicate with the same preceptors completing the evaluations longitudinally. Athletic training has a high turnover at certain clinical sites, especially those with graduate assistants and residents serving as preceptors for students. It may be challenging to collect longitudinal data of this kind without controlling for those factors. An additional limitation of this study would be to consider the publication date in relation to the extensive changes that have occurred in athletic training education since its publication.

In a literature review by Schilling (2012), it was reported that a combination of assessments may be needed to determine students' true level of competency. Students need to be able to demonstrate skill and knowledge across a broad spectrum of tasks to be successful as practitioners. While this review specifically examined summative assessments in a didactic context rather than clinical experience, Schilling noted the importance of developing valid and reliable measurements. Demonstrating that as a profession athletic training education is using evidence-based assessments, will help align clinicians with other allied health professions (Schilling, 2012).

Literature specific to clinical education assessments in athletic training continues to be limited. Few current empirical articles have been published examining the utility of the clinical assessments being employed in ATEPs. With changes in the athletic training degree and new curriculum standards, it is imperative that programs re-evaluate current assessments. More



research is needed to provide guidance for those programs moving forward in the advancement of the profession.

### **Milestones: The Potential Impact**

A study by Friedman et al. (2014) examined the transition from a Dreyfus model of assessment to an ACGME Milestones-based model in one graduate medical residency program. Over the course of two academic years, the study compared and analyzed all evaluations completed by faculty for the years 2010-2011 (Dreyfus model) and 2011-2012 (Milestones). It was reported that the residency program using the Milestones-based evaluation saw an enhanced distinction ability of the evaluator, therefore, demonstrating greater differences between the levels of residents. Whereas, in the Dreyfus model, resident scores from different classes (level 2 and 3) overlapped significantly (Friedman et al., 2014). These findings suggest that the Milestones-based evaluation was better able to mirror the differences in clinical skills among resident levels. Additionally, in the Dreyfus model, faculty were not utilizing the full range of the 5-point scale, with the scores being more clustered at the high end (Friedman et al., 2014). Using the Milestones-based evaluation, faculty were using a wider range of the 5-point scale and more frequently rated with lower scores. The authors noted that transitioning to a Milestones-based evaluation may counteract the ceiling effect often seen in global rating forms, and help faculty develop focused observations and documentation of behaviors (Friedman et al., 2014). A strength of this study was that the residency program was able to develop a consistent scoring (5-point scale) through the transition from a Dreyfus model to a Milestones-based model across the two years of data collection. This consistent scoring allowed for the comparison between models with a large amount of data, 1,200 evaluations (Friedman et al., 2014).

Similarly, Kuo et al. (2015) evaluated two distinct evaluation systems in a university residency program including a traditional assessment and a Milestones-based evaluation. Scores from the two assessments were analyzed and compared. Score distribution for the traditional assessment showed similar scoring between all resident classes (i.e. level of residents); while the Milestone-based assessment showed an increased distribution of scores among the available range. The differentiation in scores between resident classes demonstrated the ability of the Milestone-based evaluation system to reflect the true differences in clinical abilities (Kuo et al., 2015). What made this study's Milestones-based evaluation distinct, were the 24 distinctive versions of the form designed specifically for different evaluators and specific disciplines (e.g. senior residents, faculty, nonphysician providers). In addition, each faculty member completed no more than seven Milestones items for each resident 2/7/2022 12:50:00 AM This residency program demonstrated taking an interdisciplinary approach to resident evaluation and could potentially be used as a model for more inclusive assessments.

While an interdisciplinary approach to evaluations may be beneficial, comparing 24 versions of a new evaluation system to one traditional global evaluation poses challenges. Further research would be needed to determine if several versions of an evaluation is needed or if one, well-composed evaluation system is satisfactory for assessment purposes. Additionally, this study only collected evaluations for the first six months of the Milestone-based assessment implementation (Kuo et al., 2015). More aggregate data would be needed to make an informed program decision regarding the success of the Milestone-based evaluation system.

Gardner et al. (2015) worked to develop and implement a comprehensive Milestones-based evaluation that aligned with the ACGME Milestones. Seeing the need for direction in designing assessments that supported the Milestones, the authors created a working group that

reviewed the residency program's previous evaluation methods and identified gaps in assessment. The group noted that while the residency program collected evaluations from a variety of sources, there were still substantial gaps in performance measures to evaluate (Gardner et al., 2015). From the findings of the review, the group mapped out how these performance measures would be assessed using Milestone-based language. This program's Milestones-based assessment was unique in that rather than developing one comprehensive evaluation, the group developed three smaller evaluations with different Milestones to be assessed by clinical faculty each month (Gardner et al., 2015). This was accomplished to help alleviate the burden on faculty completing the assessments. Additionally, traditional Likert and scale rating systems were exchanged for an observed/not observed with narrative components for faculty to describe observations of performance (Gardner et al., 2015)

In 2020, Sorge et al. examined faculty understanding and value of the emergency medicine Milestones using a developed survey instrument. The survey was designed to target program directors and faculty in emergency medicine residency programs. Respondents were asked to report their understanding of the Milestones and how faculty were educated on the Milestones. Results indicated that respondents had a less than favorable understanding of the Milestones specific to emergency medicine (Sorge et al., 2020). Forty-nine percent of the respondents indicated that faculty had a poor or fair understanding of the Milestones. Additionally, only 50% of the respondents felt that the Milestones for emergency medicine were a valuable tool for assessment (Sorge et al., 2020). These results suggest that there needs to be more faculty development and training in the area of assessment and the transition to Milestones-based evaluations. It was noted in respondent comments that the Milestones were, in theory,

good and were useful in identifying struggling students, but were not as valuable in providing feedback for high-achieving students (Sorge et al., 2020).

The findings from the Sorge et al. study (2020) contradict those reported in Gardner et al. (2015), Friedman et al. (2014), and Kuo et al. (2015). The findings of Friedman et al. (2014), Gardner et al. (2015), and Kuo et al. (2015) reported that the Milestones-based assessments provided more specific and valuable feedback for both remedial and successful students by giving specific content areas for development. As is commonly experienced survey research designs, this study was limited by sample size and response bias. The study had an adequate response rate at 70%; however, it may still not accurately reflect the opinions, values, and beliefs of the entire population (Sorge et al., 2020). Those who responded may have felt passionately about the topic or have been hesitant to answer truthfully.

A study by Meier et al. (2016) specifically examined the use of a Milestones-based assessment on self-evaluations for residents and faculty engagement in a graduate medical residency program. Seeing the need to transition to a Milestones-based assessment to align with ACGME guidelines, this residency program worked to develop and implement a new evaluation procedure for residents (Meier et al., 2016). Every six months residents were asked to complete a Milestones-based self-evaluation prior to meeting with their assigned faculty advisor. The faculty advisor was also asked to complete a Milestones evaluation of the resident. Following the evaluations, the advisor and resident would meet to discuss each item of the evaluation, concentrating on items with significant discrepancies between the two raters. Then following the meeting, scores from the self-evaluation and faculty evaluation were sent to the program's clinical competency committee (CCC), where the resident's final scores would be decided and submitted (Meier et al., 2016). The group collected Milestones scores from three time points

from self-evaluations, advisors, and the CCC. Statistical analysis showed that over the three time points there was a steady increase in summative scores for residents. Additionally, there were no significant differences between raters (i.e. self, advisors, CCC) (Meier et al., 2016). During implementation, the program placed a special focus on the verbal anchors of the Milestones in the evaluation, stressing their significance to both residents and faculty. These findings indicate that the use of three evaluators could contribute to increased communication and engagement within the program. Furthermore, the incorporation of self-evaluations helped residents become comfortable with and understand how they were being assessed (Meier et al., 2016). While the authors noted that these were the results of a preliminary investigation, they were hopeful in continued data collection.

A key observation among these investigations was the amount of time and resources dedicated to the education of those completing the evaluations (i.e. clinical faculty). Friedman et al. (2014) indicated in the procedures that all faculty were trained on the evaluation method during a session including an introduction to the Milestones Model and break out groups for practice using the instrument. Additionally, Kuo et al. (2015) described implementing a faculty and resident educational meeting where the new Milestones evaluation system was presented and participants were able to ask questions. Furthermore, Meier et al. (2016) purposefully structured their evaluation procedures to insure faculty and resident engagement throughout the assessment process. A Milestones-based evaluation may appear different from traditional evaluations many faculty members are accustomed to using. The successful implementation of a new evaluation could be reliant on the preparation and education of those using the instrument.

A qualitative study by Dzara et al. (2019) investigated residency programs' experiences with transitioning and implementing Milestones-based assessments. Using semi-structured

interviews, the authors explored residency program leaders' experiences and the impact of the transition on programs. From these interviews, three significant themes were identified including challenges faced in effective implementation, focusing on adapting the Milestones to make them work within programs, and seeing the value and utility to move toward Milestone-based assessments (Dzara et al., 2019). Specifically, program leaders felt there needed to be more guidance for implementing; as early programs lacked specific direction, tools, and motivation to make changes to their assessments. In adopting the Milestones into assessments, many leaders saw the shift as an opportunity to revise current evaluations, while others noted frustration in attempting to blend the Milestones into existing assessments. Most program leaders indicated facing challenges with initial implementation strategies, however, many recognized that the transition to Milestones brought a restored value on student-centered learning, observation, and the development of more structured assessments (Dzara et al., 2019). Early efforts to implement the ACGME Milestones were comparable to, as Iobst (2015) noted, building the plane as we fly it.

It is likely that as athletic training education makes the transition to a graduate degree and adopting the AT Milestones, programs may face similar challenges. As there were vocal frustrations and concerns about the move to a graduate level degree (MAT), there may be a similar response to the promotion of AT Milestones in assessment (Pitney, 2012). One of the major influences in the graduate education decision was to consider athletic training's position among peer professions (Pitney, 2012; NATA Work Group on Professional Education in Athletic Training, 2013). In the need to grow in recognition, more research is needed around assessment specific to athletic training for the profession to take a seat at the table.

## Statement of Problem

The change in the university/college degree allows for programs to re-evaluate and redefine curriculum instruction and delivery (Edler et al., 2017). Through this transition, it is necessary for program administrators to create and design assessment instruments that adequately evaluate clinical education and competency of students (Moffit et al., 2016). Holmboe et al. (2010), stated that the community needs to move away from developing multiple 'home-grown' assessment tools and work instead toward the adoption of a core set of assessment tools that will be used across all programs within a country or region. Changes in academic requirements coming from CAATE will demand a re-examination of the structure of evaluations currently being used by athletic training programs as they transition to the MAT. Furthermore, reliable and valuable instruments will need to be developed to meet the evolving structure of clinical education. To date, there has been no published literature on the AT Milestones project. It is important to evaluate current AT program faculty's understanding of the AT Milestones, and if or how they intend to use the AT Milestones to guide assessment development.

Using a mixed methods design, the purpose of this study is to examine the perceptions of athletic training educators on current clinical evaluation assessments, and program evaluations' alignment to the AT Milestones project. This research will serve as an initial investigation into faculty's understanding, use, and intentions for implementing the AT Milestones. In addition, this study will examine clinical evaluations and their correlation to the principles of the AT Milestones. This investigation will seek to answer the following two research questions. What are the perceptions of athletic training faculty about current clinical evaluation assessments and the AT Milestones? How do clinical evaluation assessments of current athletic training education programs align with the AT Milestones?

## CHAPTER III: METHODOLOGY

The purpose of this study was to gain insight into the perceptions of athletic training educators on current clinical evaluation assessments, and those assessments alignment to the AT Milestones project. This study used a mixed methods approach to investigate the study's primary research questions.

### **Research Questions**

1. What are the perceptions of athletic training faculty about current clinical evaluation assessments and the AT Milestones?
2. How do clinical evaluation assessments of current athletic training education programs align with the AT Milestones?

### **Hypotheses**

The purpose of this study was to investigate the current climate of clinical education assessments in athletic training education. This research sought to answer two primary research questions. What are the perceptions of athletic training faculty about current clinical evaluation assessments and the AT Milestones? How do clinical evaluation assessments of current athletic training education programs align with the AT Milestones? Based on the limited available research in this area and anecdotal evidence, my hypotheses were structured around the following connections.

H<sub>1</sub>: There is a relationship between the respondent's role and their understanding of the AT Milestones project.

H<sub>2</sub> : Programs offering or transitioning to a master's of athletic training (MAT) degree will be more likely to have plans to implement or will have implemented the AT Milestones into clinical evaluations.



H<sub>3</sub> : The majority of evaluations submitted will have a moderate to high association to the AT Milestones concepts.

### **Research Design**

A convergent-parallel design was to guide this investigation in athletic training education clinical assessments. In this design, a researcher first collects two types of data in a single phase (Creswell & Creswell, 2018; Creswell & Plano Clark, 2011; Fetters et al., 2013). Next, the researcher analyzes the two data sets independently from one another (Creswell & Plano Clark, 2011). Once the data have been analyzed using the appropriate analytic procedures, the researcher merges the data for interpretation (Creswell & Plano Clark, 2011). Data for this study was completed in a single-phase using a developed survey instrument and data analysis occurred in three separate phases before the results were combined for interpretation. The purpose of a convergent design is to obtain different yet complementary data on a topic or phenomenon (Creswell & Plano Clark, 2011). Therefore, the quantitative and qualitative data collected in this study shared equal priority. The rationale for this approach is that gathering data from multiple perspectives would provide an umbrella of understanding on a relatively new topic in the field (Creswell & Plano Clark, 2011). Specifically, in this research, a convergent design was used to add to the limited existing knowledge base, and focus on developing conclusions to improve practices (Newman et al., 2011).

The purpose of this convergent study was to examine the types of assessments athletic training programs are using to evaluate student competency in the clinical setting, and how those assessments align with the AT Milestones. In addition, this research explored faculty perceptions of current clinical assessments and their attitudes toward the AT Milestones Project. The objective of the quantitative phase of this study was to collect information on faculty perceptions

of clinical assessments and those of the AT Milestones Project. The objective of the qualitative phase of this study was to conduct a content analysis of collected clinical assessments and responses from programs participating in the study.

Mixed methods research resides in the middle of the qualitative and quantitative continuum in that it incorporates elements of each methodology into the design (Creswell & Creswell, 2018). By integrating data through mixed methods, researchers can demonstrate more insight into a problem and can provide stronger evidence to draw conclusions rather than solely one type of data alone (Creswell & Creswell, 2018; Fetters et al., 2013). Often, quantitative data addresses causality and draws generalized concepts. Quantitative results can be used to help explain findings from the qualitative data. Conversely, qualitative data can provide depth and detail to quantitative statistics by exploring why's and how's of a phenomenon. The goal of mixed methods research is not to replace either of these approaches but rather to draw from the strengths and minimize the shortcomings of both in a single research studies and across studies (Johnson & Onwuegbuzie, 2004, p. 14-15). Furthermore, mixed methods research has shown to be useful in examining events where there are multiple stakeholders to influencing factors to consider (Kay & Kucera, 2018).

A mixed methods approach best suits this line of research as an exploratory investigation to clinical assessments and the AT Milestones Project. As the AT Milestones Project is relatively new, it is important to investigate current clinical evaluations from multiple approaches including gathering perspectives from program faculty and collecting summative assessment materials. Used alone, the quantitative component of this study may not provide the researchers an accurate picture of what is occurring in athletic training assessments at this time. However, coupled with a qualitative analysis of assessments and perceptions, the study may provide the

depth needed to gain a better understanding of how programs are implementing clinical evaluations and future directions of assessments.

Additionally, it is the nature of the research questions that drive the methods of the investigation (Creswell & Creswell, 2018; Fetters et al., 2013). Questions that have been shaped with how and why have traditionally been linked to qualitative inquiry. Whereas, who, what, and how much types of inquiries have been associated with quantitative questioning (Creswell & Plano Clark, 2011). Instead of forcing the type of research through question wording, researchers should be familiar with both types of inquiry and allow the questions to guide the path of investigation. Specifically, in this research a mixed methods approach is appropriate because both types of questions are being investigated.

While there are benefits to using mixed methods in response to the research question, mixed methods designs do require additional skills, time, and resources from the research team (Kay & Kucera, 2018). Because using mixed methods is essentially performing two studies simultaneously, overall it can be more challenging than utilizing only one methodology (Kay & Kucera, 2018). Additional time and planning are required in a mixed methods study, to ensure that the procedures are well designed and can be implemented effectively. Many researchers are hesitant to employ mixed methods due to the demands of the study, or because of the stigma surrounding the legitimacy mixed methods research (Kay & Kucera, 2018). However, this challenge can be seen as an opportunity to demonstrate how mixed methods research can provide unique benefits to the literature (Kay & Kucera, 2018).

The use of qualitative and mixed methods research in the sciences and allied health fields has continued to gain traction in the last decade (Pitney & Parker, 2001). Researchers have begun to see the benefits qualitative and mixed methods designs have to offer by filling gaps in

the research that quantitative analysis cannot answer alone (Dongre et al., 2009). While largely a scientific field of study, where the background has traditionally been quantitative research, athletic training now looks to other methods of research to help further our understanding of the professional roles in a social context (Pitney & Parker, 2001).

Specifically, in athletic training, sports medicine, and allied health, mixed methods designs present opportunities for researchers to work collaboratively in an interdisciplinary approach to offset the limitations they may face in their own methodology backgrounds (Kay & Kucera, 2018). Several recent studies in athletic training education have taken a mixed methods approach to larger investigations that have resulted in several publications and adding significant contributions to knowledge in the field (Bowman et al., 2015, 2017; Mazerolle et al., 2014a, 2014b). Similar to these existing studies, this research project has the ability to develop into several future investigations and lines of research.

### **Participants**

The participants in this study were ATEP program directors (PDs) and clinical education coordinators (CECs). These faculty members are in the most appropriate positions to have knowledge of current clinical evaluation assessments, changes in program assessments, and an understanding of the AT Milestones Project. Since CECs were more challenging to contact directly, survey participation was solicited from PDs using contact information from the CAATE website. In the survey instructions a note was added to forward the survey on to the most appropriate program staff member.

Recruitment emails were sent to 409 program directors of athletic training education and residency programs nationwide. A second recruitment email was sent 14 days after the initial email was sent to program directors to encourage participation. 57 participants responded to the

online questionnaire, with 3 respondents being excluded due to incomplete questionnaires. A total of 54 responses were recorded and analyzed. In addition to the survey responses, 4 institutions provided clinical evaluations for analysis. Overall, this survey had a response rate of 13%. When the response rate that falls below 60%, the researcher loses the ability to make the claim that the survey is representative of the entire population and decreases the generalizability of the study.

### **Instrumentation**

For this study, I developed a questionnaire to be distributed to ATEP program faculty for participation. Survey research has become increasingly popular in athletic training education research (Burton & Mazerolle, 2011; Turocy, 2002). By using surveys, researchers are able to get a glimpse of what is occurring in a certain event, situation, or time (Turocy, 2002).

Additionally, using survey instruments in research often times gives the researcher an overview, and provides access to random samples of respondents; which in turn, allows the researcher to develop generalizations from the results (Burton & Mazerolle, 2011). Specifically, questionnaires are of benefit when gathering information about feelings, perceptions, or beliefs about a topic. Respondents are able to complete the survey on their own time, at their own pace, and, unlike interviews and focus groups, provides the security of anonymity (Burton & Mazerolle, 2011; Turocy, 2002).

While there are many perceived benefits of using survey instruments in research, they are not without limitations. It is important to know and understand the limitations of survey research before designing and implementing them into practice (Fogli & Herkenhoff, 2018). With survey research, the goal is to reach a representative sample of individuals that accurately reflect the population; however, statistical errors can still occur due to chance variation. Increasing sample

size and using appropriate measures to target the correct sample size can help reduce sampling error. While a quality survey instrument attempts to control for sampling and systematic errors, limitations on behalf of the respondents are more difficult to control (Burton & Mazerolle, 2011; Fogli & Herkenhoff, 2018). Survey research is dependent on the assumption that respondents are willing, able, and are truthful in their responses, known as response bias (Fogli & Herkenhoff, 2018).

To reduce the chance for respondent error, researchers should focus on developing questions that will help maximize validity (Krosnick et al., 2014). The validity of an instrument is the degree that the instrument truly measures the intended item or construct (Burton & Mazerolle, 2011). To establish face and content validity, expert panels are brought in to evaluate the instrument's appearance (face validity) and representativeness of the subject matter being studied (content validity) (Burton & Mazerolle, 2011; Turocy, 2002). Criterion and construct validity represent higher levels of validity for instrument design (Burton & Mazerolle, 2011; Creswell & Creswell, 2018). Criterion validity examines how the instrument results align with previous research and other developed instruments. Construct validity then assesses how the instrument aligns with theoretical concepts (Creswell & Creswell, 2018).

To help establish validity in this study's questionnaire, I sought to establish face and content validity by pilot testing the instrument. While criterion and construct validity are measures of a more valid instrument, in this specific research, criterion and construct validity will be difficult to attain. First, because criterion validity uses previously established and validated instruments for comparison (Burton & Mazerolle, 2011; Turocy, 2002) and such instruments have not been previously developed or established for this specific topic. This study was the first to examine clinical evaluations for this perspective, therefore, instruments to use as

a comparison are limited. However, survey instruments developed by Edgar et al. (2018) and Sorge et al. (2020) in their respective investigations may serve as a useful guide in questionnaire development. Secondly, to meet construct validity requirements, the instrument may need to be tested several times with large samples to determine that the constructs which are claiming to be tested are accurately being measured (Haynes et al., 1995). Because of the timeframe and possible small population sizes this type of validity testing was not be feasible for this study.

### **Questionnaire Design**

Design, layout, and formatting play a crucial role in questionnaire development (Boynton & Greenhalgh, 2004). Decisions need to be made regarding each question, with the results having possibly significant impact on the study's validity and outcomes (Krosnick et al., 2014). Aspects to be considered in questionnaire design include open and close-ended questions, response metrics, word choice, question order, and overall appearance (Krosnick et al., 2014; Turocy, 2002).

Specifically, this study used questionnaire with close-ended and open-ended questions. This approach can be beneficial in exploratory research because it allows for respondents to provide additional commentary in open-ended responses that expand on the responses of the close-ended questions. It has been noted that open-ended questions have higher reliabilities and validities than close-ended questions (Krosnick et al., 2014).

Another important note to consider in questionnaire development is the use of response metrics. The optimal number of points on response metrics ranges from five to seven (Krosnick et al., 2014). Furthermore, it has been demonstrated that data quality and respondent satisfaction improve when the scale points are labeled with words (e.g., not satisfied, satisfied, or highly

satisfied) (Krosnick et al., 2014). This study used labeled rating scales for close-ended questions in the survey instrument.

To avoid confusion, misinterpretation, or biasing, appropriate consideration needs to be given to question wording throughout the instrument (Krosnick et al., 2014). Visser et al. (2013), recommended avoiding ambiguity and asking two questions at once, also known as double-barreled questions. Additionally, questions should be worded in neutral terminology to limit reflexive answers from respondents. Furthermore, questions should be relevant to the study’s purpose and formatted to flow within the questionnaire. Turocy (2002), recommended developing a table of specifications to use as a guide to delineate the main topic of the questionnaire (see Table 4).

**Table 4**

*Table of Specifications for Survey Instrument*

Variables	Variable Type	Level of Measurement	Categories
Respondent’s role or position	Independent	Nominal	1 – Director or Program chair 2 – Clinical coordinator 3 – Faculty 4 – Other
AT program Status	Independent	Nominal	1 – Good standing 2 – Probation 3 – In-transition 4 – Voluntary withdrawal 5 – Seeking accreditation
Degree level offered	Independent	Ordinal	1 – Baccalaureate 2 – Professional master’s 3 – Post-professional master’s
Stakeholder involvement	Independent	Ordinal	1 – Faculty 2 – Preceptors 3 – University assessment group

Table Continues

Table Continues



Variables	Variable Type	Level of Measurement	Categories
			4 – Students 5 – Other
Satisfaction with overall assessment	Dependent	Nominal	1 – Yes 2 – No 3 – Comments
Satisfaction with assessment components <i>Length of evaluation</i> <i>Ease of use</i> <i>Preceptor response</i> <i>Type of feedback</i> <i>Quality of feedback</i>	Dependent	Ordinal	1 – Very dissatisfied 2 – Dissatisfied 3 – Unsure 4 – Satisfied 5 – Very satisfied
Planning assessment changes	Dependent	Nominal	1 – Yes 2 – No 3 – Undecided
Understanding of AT Milestones	Dependent	Ordinal	1 – None 2 – Very little understanding 3 – General understanding 4 – Extensive understanding
Planning AT Milestones implementation	Dependent	Ordinal	1 – No, and do not plan on using for implementation 2 – No, not at this time 3 – Unsure, at this time 4 – Yes, but have not developed plan for implementation 5 – Yes, we have developed a plan for implementation 6 – Yes, we are currently implementing for assessment
Valuable information in clinical assessment? <i>Faculty</i> <i>Student</i>	Dependent	Qualitative	

Table Continues

Variables	Variable Type	Level of Measurement	Categories
Benefits of AT Milestones?	Dependent	Qualitative	
Drawbacks of AT Milestones?	Dependent	Qualitative	

A distinctive part of this questionnaire was the document upload portion at the conclusion of the survey. Specifically, at the conclusion of the questionnaire, participants were asked to voluntarily submit a copy of their program’s current clinical evaluations. Respondents were informed that this portion of the survey was optional and not necessary for their previous responses to be recorded. Those who chose to participate were asked to remove program identifiers from the document and upload their document(s) as either an MS Word or PDF document. Those identifiers that were not removed prior to submission, were removed or redacted by a member of the research team before data analysis occurs. These document submissions served as the primary qualitative data component of the study.

### **Pilot Testing**

Before administering the survey to prospective athletic training faculty for participation, the questionnaire underwent a pilot test. Pilot tests are implemented to address any possible problems in the survey process prior to putting the survey into production (Rothgeb, 2008). One of the primary objectives of pilot testing is to identify, address, and reduce the amount of non-sampling measurement error. For this pilot, a nonrandom convenience sample was used, and specifically sought feedback from 10-12 faculty members from Illinois State University, who familiar with clinical education assessments in various fields including athletic training, physical education, medicine and nursing.

Specifically, for this survey, I wanted to ensure that there is clarity in the questions being asked and that the participants are accurately interpreting the satisfaction scales. To measure internal consistency of the questionnaire, I computed a Cronbach's alpha reliability coefficient. Cronbach's alpha are used when the researcher wants to know if items on a questionnaire are consistent with one another in that they represent one construct or area of interest (Salkind, 2017). For example, my questionnaire contained seven questions regarding satisfaction with current program clinical evaluations. If a respondent reported that they are "dissatisfied" with two or more items on the scale, it was expected that they would also not be overall satisfied with the current program evaluations.

### **Data Analysis**

Data analysis for this convergent-parallel design was conducted in three distinct phases. First, both qualitative and quantitative data were gathered using a single questionnaire. After data collection, the data was separated into quantitative and qualitative raw data to be analyzed. Second, the quantitative data was analyzed using SPSS statistical software. The qualitative data was coded using conventional content analysis. Third, the uploaded clinical evaluation documents were collected for a separate content analysis using a criteria list. See Table 5 for procedures and data collection crosswalk.

**Table 5**

*Procedures & Data Analyses Crosswalk Table*

Research Questions	Data Source	Data Analysis
1. What are the perceptions of athletic training faculty about current clinical evaluation assessments and the AT Milestones?	Survey Instrument	Descriptive & Inferential Statistics  Conventional content analysis for coding and emerging themes from open-ended items
2. How do clinical evaluation assessments of current athletic training education programs align with the AT Milestones?	Clinical Evaluation Assessment Collection	Criteria list analysis and scoring

**Quantitative Data Analysis**

Quantitative data from this study was derived from the questionnaire. Firstly, demographic information was collected from respondents. These demographics included current role, status of the AT program, and degree level of the AT program. These variables were measured as nominal data and served as the primary independent variables. Additional independent variables included stakeholder involvement and overall satisfaction with clinical assessments. Likert scale measurements were used as dependent variables evaluating satisfaction with specific components of current clinical evaluations. The questionnaire also collected dependent data on the respondent’s understanding of the AT Milestones, plans to revise current assessments, and plans to implement AT Milestones-based clinical evaluations.

Descriptive and inferential statistics were calculated for the quantitative data gathered from the questionnaire. Descriptive statistics should be used to organize and describe

characteristics of the data collection (Salkind, 2017). Often descriptive statistics are used to denote the frequencies or to compute the average number of responses for a particular construct from the questionnaire. Inferential statistics traditionally follow descriptive statistics and allow the researcher to make inferences about different groups within the data.

Measures of central tendency included mean, median, and mode (Salkind, 2017). Each provides the researcher with a different type of information about how scores among the data are distributed. Determining the appropriate measure of central tendency is dependent on the level of measurement of the data. The four levels of measurement include nominal, ordinal, interval, and ratio level data (Salkind, 2017). This study used nominal and ordinal level data throughout the questionnaire. Questions regarding participant demographics were measured as nominal data; whereas, constructs like satisfaction levels and perceptions were measured as ordinal data. Statistical analysis for this study were run using SPSS software.

Descriptive statistical analyses were computed for demographic data including respondent roles, program status, and degrees offered. Frequencies and descriptive statistics of variables and calculating measures of central tendencies (i.e. mean, median, mode) provide information on the distribution of the data (Salkind, 2017). Understanding how the data is distributed can provide a picture of the respondents and lay the foundation for further statistical analysis.

In order to address Research Question 1, I evaluated the following satisfaction scores for clinical education evaluations: (a) length of evaluation, (b) ease of use, (c) preceptor response, (d) type of feedback, (e) quality of feedback, (f) method of delivery, (g) content being addressed, and (h) overall satisfaction by conducting *t*-tests and an analyses of variance (ANOVA). These statistical tests are used when assessing for differences between mean scores of different groups.

Specifically, *t*-tests are used when comparing the mean scores of an interval-level dependent variable by the two categories of the independent variable. For example, an independent-sample *t*-test was computed to examine the relationship between the means of the dependent, interval-level clinical evaluation satisfaction composition scores by types of program roles (e.g., director and clinical coordinator).

To investigate Research Question 1 with categorical level data, I used non-parametric statistics, specifically cross-tabulations and chi-square tests to assess the measures of association (Salkind, 2017). Cross-tabulations, or contingency tables, are used to analyze the associations of two or more categorical variables (Momeni et al., 2018). Furthermore, a chi-square test statistics will be calculated to compare the distributions of the variables to determine if there is any association between the two categorical variables (Momeni et al., 2018). In this investigation, a cross-tabulation analysis was used to examine the association between the degree levels offered (e.g., baccalaureate, professional masters, post-professional masters, doctor of athletic training, special residency) and plans for implementing the AT Milestones (e.g., no, unsure, and yes).

### **Qualitative Data Analysis**

To further address Research Question 1, and to enhance the discourse of close-ended responses, a qualitative analysis of the open-ended questionnaire responses was conducted using conventional content analysis. Content analysis is the process of extracting objectives from texts to examine for meanings and patterns that can be observed (Prasad, 2019). Originally, content analysis was primarily used to evaluate documents producing categories from word or phrase counts; it has now expanded to include language and dialog (Cavanagh, 1997). Prior research has noted that content analysis is a more flexible method for analyzing text data (Hsieh & Shannon, 2005). While the versatility and flexibility of content analysis makes it popular among

researchers, its lack of definition and procedures can be potentially limiting for its application (Dongre et al., 2009; Hsieh & Shannon, 2005). In content analysis, the application of coding procedures are carried out through explicit rules that are applied consistently throughout the data analysis process (Prasad, 2019). This type of analysis can be beneficial for those who are new to qualitative analysis by providing a structured guideline for examination (Hsieh & Shannon, 2005; Prasad, 2019).

Conventional content analysis is generally used and appropriate when research in the area of interest is limited and the researchers' aim is to describe a phenomenon (Hsieh & Shannon, 2005). In a conventional analysis rather than using pre-determined categories, the researcher identifies themes that can be observed from the data (Hsieh & Shannon, 2005). The investigator begins by examining each response and coding the words, content, phrases and forms into categories. From each response, the categories are compared to form larger collections and categories that can be used to interpret meaning (Dongre et al., 2009). This type of content analysis was beneficial in analyzing the text presented in the open-ended responses, by allowing the text to guide what themes emerged.

Data analysis of the collected clinical evaluation assessments voluntarily submitted by the participants was conducted through a criteria list analysis to address Research Question 2. Criteria lists are a form of a scale or checklist that can be used to assess the contents or integrity of a document. With a scale, responses to individual items are summed to create an overall score representing designated outcome, with the outcome often indicating quality (Armijo Olivo et al., 2008). Criteria lists have been developed in many fields including health care, to assess quality of measurement in instruments (Verhagen et al., 1998). These scales are then often used to assess validity and reliability of the individual instrument. I used a developed list of criteria to examine

each evaluation's alignment with the concepts from the AT Milestones. These criteria were assessed using a series of 10 yes/no questions. See Table 6 for the criteria questions. Each evaluation then received a score out of 10 (1=yes, 0=no), with the higher score indicating a greater alignment with the AT Milestones objectives.

As an example of a criteria list, the Physiotherapy Evidence Database (PEDro) scale was developed to evaluate the quality of randomized controlled trials (Maher et al., 2003). Similarly, this study sought to develop a set of measures that could be used to assess the quality of an evaluation instrument to the criteria of the AT Milestones. Noting a growing demand for evidence-based practice in healthcare, the PEDro scale was developed as a resource to index and evaluate published randomized-controlled trials, systematic reviews, and meta-analyses (Kamper et al., 2015). The distinguishing feature of this database is that the PEDro scale can be used to rate the methodological quality of a study. The PEDro scale is composed of 10 criteria items that relate to the internal and external validity of a randomized control trial. The scale allows for the reader to quickly judge if the study can be trusted and meaningfully interpreted. Additionally, the scale provides a universal rating system to improve the consistency and reliability of the raters. The PEDro scale has demonstrated a high reliability and validity as a research instrument.

A benefit to using criteria analysis is that it provided a uniform guideline for me to delineate and interpret each evaluation. Specifically, using a standard guide was beneficial when working with several unique documents. Additionally, using a criteria list aided in the reliability of data analysis between coders by creating an intercoder agreement. This agreement helps when several individuals code, transcribe, and compare work to determine if the same or different themes emerged (Creswell & Plano Clark, 2011). Based on this type of analysis, different coders would compare each line item scoring as well as the total score out of ten.



Often these types of criteria lists involve implementing a Delphi technique to create a comprehensive and peer-reviewed list (Verhagen et al., 1998; Weidner & Henning, 2004). A Delphi technique is a multi-staged survey that attempts to achieve consensus on an important issue. A Delphi technique works under the assumption that a group of experts' opinions are considered more valid and reliable than an individual opinion alone (Keeney et al., 2011). Delphi techniques can be very time demanding and requires a number of participants to act as panelists for scale development (Verhagen et al., 1998; Weidner & Henning, 2004). Often to develop a consensus among experts, several rounds of surveys must be completed (Keeney et al., 2011). However, the purpose of this study is not to develop a standard set of criteria for clinical evaluations. Therefore, the use of the criteria list was only to aid the researcher with data analysis. The criteria list was developed by the researcher with consultation from a small group of experts in the field.

**Table 6**

*AT Milestones Criteria List*

1. Each evaluation item contains a correlating competency & sub-competency?	Yes/No
2. Does the evaluation use consistent AT Milestones terminology?	Yes/No
3. Is this evaluation instrument used across the program for addressing the learning continuum?	Yes/No
4. Does the evaluation use consistent AT Milestones level scoring?	Yes/No
5. Does the evaluation address all six AT Milestones core competencies?	Yes/No
6. Does the evaluation contain a narrative component of direct observation?	Yes/No
7. Does the evaluation contain a student self-evaluation component?	Yes/No
8. Does the evaluation contain an <u>action plan</u> component based on feedback or narrative section?	Yes/No
9. Does the evaluation include input from multiple scorers or evaluators (i.e. faculty/preceptor)?	Yes/No
10. Is the evaluation designed to be used for long-term rotations (3 mo. or longer)?	Yes/No

## **Data Merging**

Mixed methods data analysis is conducted to answer the research questions as to whether the results from both analyses converge and specifically how they converge (Creswell & Plano Clark, 2011). Data for this study was merged or integrated during the interpretation phase. Integration at this level is used when qualitative and quantitative data are collected concurrently, analyzed separately, and then combined during the discussion (Kay & Kucera, 2018, p. 405).

Through integration at the discussion level, I hoped to link the qualitative and quantitative outcomes. Linking can occur in several ways including connecting, building, merging, and embedding (Fetters et al., 2013). Specifically, this study looked to form connections between questionnaire responses and collected evaluation instruments. For example, participants responding as having a general or extensive understanding of the AT Milestones, may be more likely to have an evaluation that accurately reflects the AT Milestones. Alternatively, respondents not planning to implement the AT Milestones, may not likely have evaluations that align with the AT Milestones. Due to the low number of collected evaluation instruments no conclusions like this could be made. However, having both types of data helped to build a narrative for current and future assessments in athletic training education.

## **Significance of Study**

The changing of degrees from bachelors to masters in athletic training education allows programs to re-evaluate and redefine curriculum instruction, delivery, and assessments (Edler et al., 2017). Currently, many programs are exploring options for crafting courses and assessments that align with the graduate mission. Through this transition, it is necessary for athletic training program administrators to create assessment instruments that align with best practices and adequately evaluates the clinical competency of students (Moffit et al., 2016). This study intends

to evaluate the assessments are currently being used to evaluate clinical competency in athletic training, and how those assessments align with the new recommendations from the AT Milestones Project and CAATE standards. Because the AT Milestones Project is relatively new, there is limited empirical evidence regarding the implementation in athletic training education. This study served as an introductory study on faculty's knowledge, perceptions, and how current assessments compare to the AT Milestones.

This study will contribute to the limited literature base on clinical assessments in athletic training education and serve as a guide for administrators in developing assessments that best fit the needs of their respective programs. Athletic training education needs to seriously examine and evaluate the assessments that are currently being implemented to evaluate students clinically, and measure how those assessments compare to those being used by peer professions under the Accreditation Council for Graduate Medical Education (ACGME) Milestones. The clinical evaluations of students play a major role in the development of the profession. Therefore, additional research is needed in the field to guide programs in academic and professional advancement.

## CHAPTER IV: RESULTS

The purpose of this study was to examine athletic training educators' perceptions of current clinical evaluation assessments, and program evaluations' alignment to the AT Milestones. This study used a mixed methods research design to evaluate perceptions of faculty about current clinical evaluation assessments and the AT Milestones, as well as evaluate how current clinical evaluations align with the AT Milestones.

### Research Questions

The two research questions that were addressed in this study were:

RQ 1: What are the perceptions of athletic training faculty about current clinical evaluation assessments and the AT Milestones?

RQ 2: How do clinical evaluation assessments of current athletic training education programs align with the AT Milestones?

### Data Results

Prior to examining the results of the analyses specifically addressing the two research questions, it was imperative to examine the demographics of the respondents to get a clearer understanding of the characteristics of the study sample. Therefore, I conducted a frequency analysis of all the demographic variables in the study (see Table 7)

**Table 7**

*Demographics of the Study Participants*

	N	%
<i>Participant Role</i>		
Program Director/Chair	38	66.7%
Clinical Education Coordinator	15	26.3%
Other Faculty	1	1.8%

Table Continues

	N	%
<i>Education Program Status</i>		
Good Standing	37	64.9%
Probation	7	12.3%
In-transition	3	5.3%
Voluntary Withdrawal	3	5.3%
Seeking Accreditation	4	7.0%
<i>Degrees Offered</i>		
Bachelors (BS/BA)	14	24.6%
Entry- level Masters (MAT)	20	35.1%
Post- Professional Masters (MS)	3	5.3%
Doctor of Athletic Training (DAT)	2	3.5%
Special Residency (SR)	3	5.3%
BS & MAT	10	24.6%
BS & MS	1	1.8%
MAT & MS	1	1.8%
Offer All Programs (BS, MAT, MS, DAT, & SR)	2	3.5%

An interesting observation from the frequency analysis showed that many respondents reported that their program was in good standing or that the program was in a transition to a master's program (e.g., in-transition, probation, seeking accreditation). It is important to note that there is potential for overlap in some of those programs working to become an accredited athletic training education program at the master's level. Additionally, it's also important to observe that many programs are still offering multiple types of degrees including two programs that offer every type of program. It is likely that these numbers will continue to shift nationally as programs transition or discontinue.

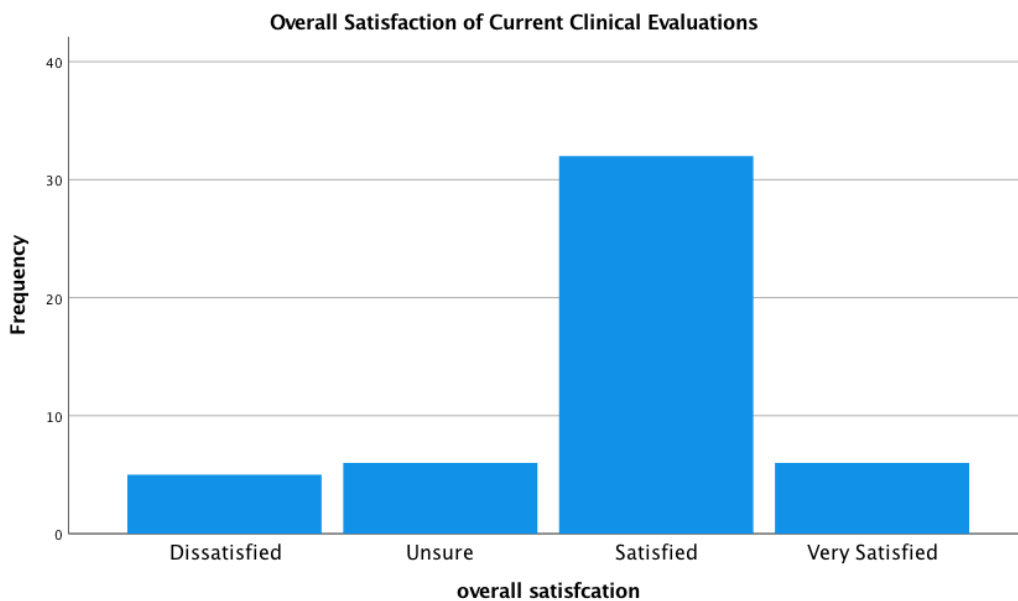
### **Research Question 1**

In order to address research question 1 (What are the perceptions of athletic training faculty about current clinical evaluation assessments and the AT Milestones?). An independent-samples *t*-test was conducted to evaluate the relationship between respondent's faculty role and their overall satisfaction score for their current clinical evaluations. The independent variables were program director and clinical education coordinator. Because only one respondent

identified as faculty, they were removed from this specific analysis. The dependent variable was the satisfaction score developed from a series of Likert-type survey questions. I computed an individual respondent average (mean) satisfaction value by summing up the individual responses to the seven satisfaction questions (length of evaluation, ease of use, preceptor response, type of feedback, usefulness, method of delivery, and content being addressed), and then dividing by seven (i.e., number of satisfaction questions). This combined satisfaction score, now treated as an interval-level variable, could then be used to compute an independent-samples *t*-test. There was no significant differences between program directors ( $M= 3.70$ ,  $SD= .836$ ) and clinical coordinators ( $M= 4.09$ ,  $SD= .391$ ),  $t_{(44)}= -1.67$ ,  $p= .103$ . The *t*-value of -1.67 was not significant as the *p* value of .103 is  $> .05$ . Cohen's effect size value ( $d= .73$ ) suggests a large practical significance (Salkind, 2017). See Figure 2 for overall satisfaction frequencies for clinical evaluations.

**Figure 2**

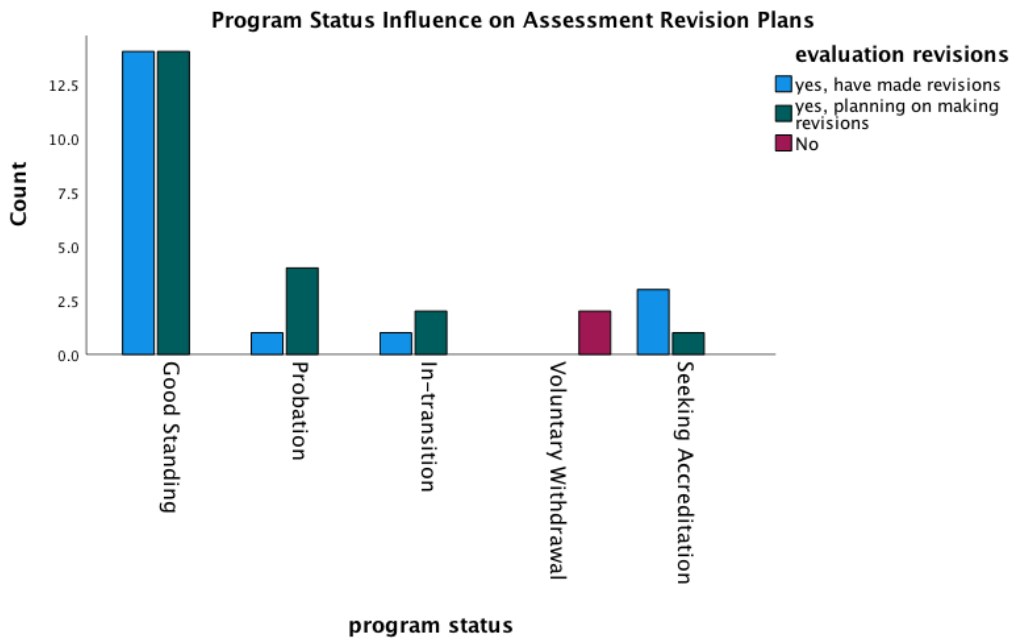
*Overall Satisfaction of Current Clinical Evaluations*



Next, a two-way contingency table analysis (i.e., crosstabulation) was conducted to evaluate whether athletic training program status influenced if the program was planning to revise clinical evaluation assessments. The two nominal-level variables were program status (good standing, probation, in-transition, voluntary withdrawal, or seeking accreditation) and revision plans (yes revision made, yes planning revisions, or no). Program status and revision plans for clinical evaluations, were found to be associated, Pearson  $\chi^2_{(1)} = 45.19, p = .001$ . Those programs that were in good standing, seeking accreditation or transitioning to a master's program were more likely to have made or planned on making clinical evaluation revisions (see Figure 3).

**Figure 3**

*Program Status Influence on Assessment Revision Plans*



Participants were asked in an open-ended response what they found most valuable for both faculty and students in a clinical evaluation assessment. Based on recorded responses, things like professionalism and soft skills were most frequently reported as valuable for *faculty* in a clinical evaluation (see Table 8). Regarding the most valuable aspects of a clinical

evaluation for *students*, faculty respondents reported that feedback was most valuable in an assessment (see Table 8). More specifically, open-ended and deliberate feedback-like comments and narratives were reported as valued.

**Table 8**

*Information Reported as Most Valuable in Clinical Evaluation Assessments*

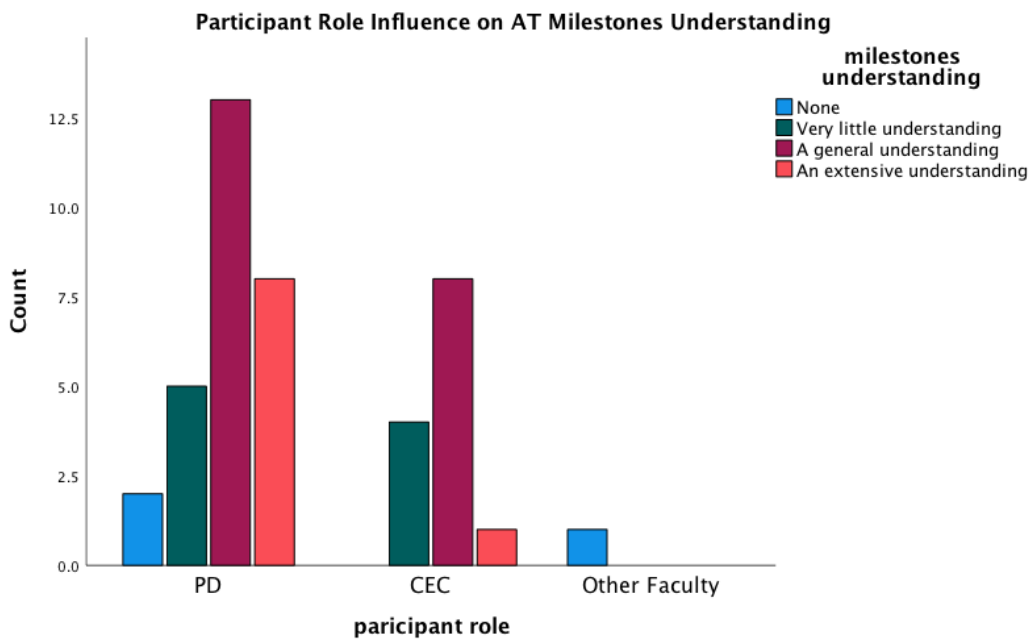
	N	%
<i>Faculty</i>		
Professionalism/ Soft Skills/ Skills	12	17.4
Competence	8	11.6
Feedback	7	10.1
Deficits or Weaknesses	7	10.1
Transfer of Knowledge	6	8.7
Student Progression	5	7.2
Critical Decision Making	5	7.2
Other Responses (see Appendix C)	19	27.5
Total	69	100.0
<i>Students</i>		
Feedback	17	25.8
Areas of improvement	9	13.6
Development	5	7.6
Growth and Progress	5	7.6
Performance and Behavior	4	6.1
Reflection	3	4.5
Competency and Proficiency	3	4.5
Transfer of Knowledge	2	3.0
Goals	2	3.0
Grades or Scores	2	3.0
Other Responses (see Appendix C)	14	21.2
Total	66	100.0



To evaluate faculty role and understanding of the AT Milestones a two-way contingency table analysis was conducted. The two nominal-level variables were participant role (program director/ clinical coordinator/ other faculty) and AT Milestones understanding (extensive/ general/ very little/ none). Participant role and understanding of the AT Milestones were found not to be related, Pearson  $X^2_{(1)} = 16.85$ ,  $p = .010$ . (see Figure 4).

**Figure 4**

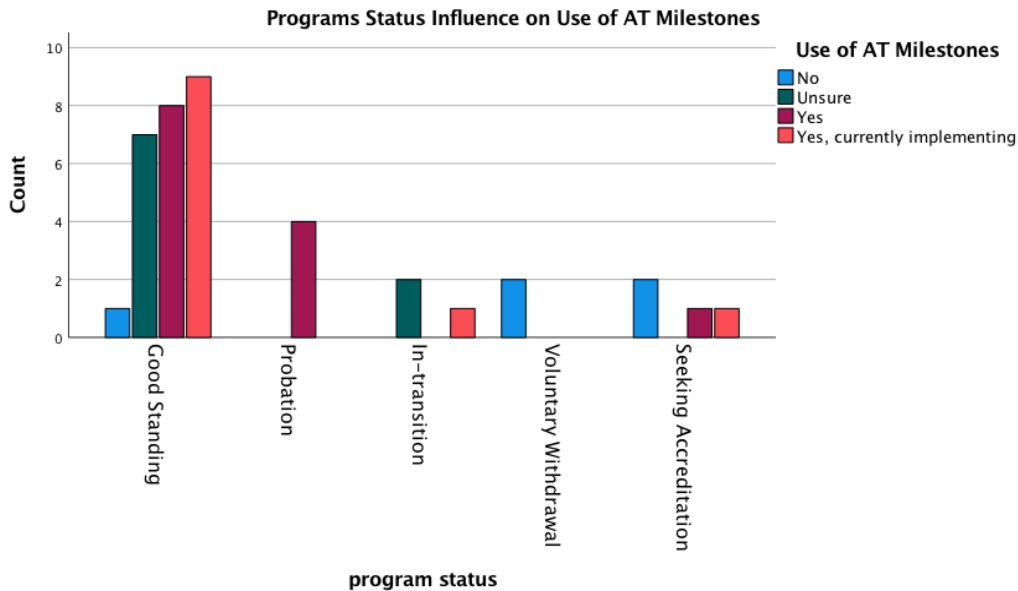
*Participant Role Influence on AT Milestones Understanding*



However, when evaluating program status as to whether the program planned to implement the AT Milestones, there was a significant relationship. A two-way contingency table analysis was conducted on the two nominal-level variables program status (good standing/probation/in-transition/voluntary withdrawal/seeking accreditation) and plans for AT Milestones implementation (no, unsure, yes, yes-currently implementing). The association between program status and plans to implement the AT Milestones was found to be statistically significant, Person  $X^2_{(1)} = 32.12$ ,  $p = .001$ . (see Figure 5)

**Figure 5**

*Program Status Influence on Use of AT Milestones*



When asked about the potential benefits using the AT Milestones in assessments, respondents reported seeing student development across the continuum most frequently (see Table 9). Additional faculty respondents felt that the AT Milestones offers the ability to provide a standardized, specific evaluation that can gauge student competency or proficiency. Regarding prospective benefits of the AT Milestones, one participant stated that, “levels of proficiency and development are important- instead of a preceptor saying the student is either ready or not; they can rate on a more specific spectrum”. Alternatively, the most reported potential drawbacks of a Milestones-bases assessment were the education and buy in of stakeholders such as preceptors, students, and faculty. One responded stated, “when initiating new assessment programs, a common obstacle is educating the stakeholders and working towards consistence in the use of new instruments”.

**Table 9***Benefits and Drawbacks of Using a Milestones-Based Assessment*

	N	%
<i>Benefits</i>		
Development across the continuum	7	14.2
Standardized	4	8.2
Specific	4	8.2
Competency/ Proficiency	4	8.2
Progression	3	6.1
Consistency	3	6.1
Framework/ Guidance	3	6.1
Shared Understanding	3	6.1
Feedback	2	4.1
Relevance	2	4.1
Unsure/ Unsure at this time	2	4.1
Other Responses (see Appendix D)	8	16.3
Total	49	100.0
<i>Drawbacks</i>		
Educating Preceptors/Faculty/Students	5	13.5
Preceptor/Faculty Understanding or Buy-in	4	10.8
Time to Complete	4	10.8
Length of Assessment	3	8.1
Too Specific or Too Much Information	3	8.1
Need a digital platform	2	5.4
Inflexible	2	5.4
Correlation with Outcomes	2	5.4
Other Responses (see Appendix D)	12	32.4
Total	37	100.0

**Research Question 2**

To address research question 2 (How do clinical evaluation assessments of current athletic training education programs align with the AT Milestones?) a criteria list was created for

analysis. Criteria lists are a form of a scale or checklist that can be used to assess the contents or integrity of a document (Armijo Olivo et al., 2008). Using a developed list of criteria, each clinical evaluation was examined to evaluate its alignment with the concepts from the AT Milestones. These criteria were addressed using a series of 10 yes/no questions. For example, question five asks, does the evaluation address all six AT Milestones core competencies? If the evaluation contained components addressing each of the six AT Milestones core competencies it would have received one point; if it did not, it would have received a zero for that question. Each evaluation received a score out of 10 (1=yes, 0= no), with a higher score indicating a greater alignment with the AT Milestones objectives (See Table 10). The average AT Milestones Alignment Criteria Score (ATMACS) among the four institutions was 55%, indicating an average alignment with the AT Milestones. The criteria scores ranged from a high of 80% alignment to a low of 20% association.

**Table 10**

*AT Milestones Alignment Criteria Score – ATMACS*

	<i>Institution A</i>	<i>Institution B</i>	<i>Institution C</i>	<i>Institution D</i>
Criteria 1	x	–	x	x
Criteria 2	x	–	–	x
Criteria 3	x	x	x	x
Criteria 4	x	–	x	x
Criteria 5	–	–	x	x
Criteria 6	x	–	x	–
Criteria 7	–	–	x	x
Criteria 8	–	–	–	x
Criteria 9	–	–	–	–
Criteria 10	x	x	x	x
%	60	20	60	80

## CHAPTER V: DISCUSSION

Athletic training education has reached a turning point where degree changes and new academic standards will demand the re-evaluation of current methods of student evaluation. As academic programs transition to the master's level degree, it is important that reliable and valuable instruments are being used to assess students in the clinical setting. Currently, there is no published literature on how programs will use or are planning to use the AT Milestones as a guide for assessment development. The purpose of this study was to examine perceptions of current clinical evaluations and those of the AT Milestones, as well as to assess how current evaluations align with the concepts from the AT Milestones project. This study addressed two research questions. The first research question addressed the perceptions of athletic training faculty about their current evaluation assessments and the AT Milestones. Research question two, asked how programs' clinical evaluation assessments align with the AT Milestones.

Respondent role and overall satisfaction with current clinical evaluations were found not to be correlated. Largely, the majority of faculty who responded reported that they are satisfied with their program's current clinical evaluations. Sixty-seven percent of faculty reported that were either *satisfied* or *very satisfied* overall with their current clinical assessments. Preceptor response, quality, and type of feedback were areas where faculty reported less satisfaction. Fourteen percent of respondents reported they were either *dissatisfied* or *very dissatisfied* with preceptor responses on their current clinical evaluations. Additionally, quality and type of feedback were faculty reported higher numbers of *dissatisfaction*.

Academic program status and the programs plans to make assessment revisions were found to be associated. Those programs who were not transitioning to a master's program were not likely to make revisions to current clinical evaluations. While those programs that currently

offer an MAT program or are in transition were more likely to make changes to their assessments.

Additionally, the respondent's program status and plans to use or implement the AT Milestones were positively associated. Those programs that reported they were in good standing, transitioning, on probation, or seeking accreditation were more likely to use the AT Milestones as a guide for developing clinical education assessments. Conversely, those programs that are voluntarily withdrawing reported that they were not intending to use the AT Milestones. However, there were a few outliers in those seeking accreditation and good standing that reported not planning to use the AT Milestones as a guide. It is possible that those seeking accreditation or in good standing that were not planning to use the AT Milestones, had already invested time into developing their own model or believe the AT Milestones will not be a good match for their program. Overall, these findings support my research hypothesis that programs offering or transitioning to an MAT will be more likely to have plans to implement or will have implemented the AT Milestones into clinical evaluations.

While participant role and level of understanding of the AT Milestones were not found to be correlated, it is important to note that most respondents reported having a general understanding of the AT Milestones. However, a few reported having an extensive understanding of the AT Milestones. This finding contradicts my research hypothesis that there would be a relationship between faculty role and understanding of the AT Milestones. Because the topic of the implementation of the AT Milestones is relatively new, this finding could indicate that many programs have just started exploring the AT Milestones as an option for assessment.

In the open-ended responses, faculty frequently reported (1) development across the continuum, (2) standardization, and (3) specificity as benefits of utilizing the AT Milestones in

clinical assessments. One faculty respondent stated that using the Milestones allows for, “tracking progress throughout the program both clinically and in the classroom. The use of the same assessment allows us to identify strength, weakness, etc. and make adjustments as the students work through the program.” These benefits have also been reported in the medical education literature (Dzara et al., 2019; Friedman et al., 2014; Gardner et al., 2015; Kuo et al., 2015).

Friedman et al. (2014), noted that the Accreditation Council for Graduate Resident Medical Education (ACGME) Milestones in medical residency programs provided more specific and valuable feedback for students and faculty. In addition, they provided specific content areas for student development. While investigating a programs’ experiences in implementing the ACGME Milestones, Dzara et al. (2019) noted that program leaders were able to acknowledge several benefits. Rather than approaching the change as a mandate, some faculty saw the Milestones as an opportunity to re-evaluate and improve assessments by altering their previous mindsets. Dzara et al. (2019) also acknowledged the drawbacks and challenges faced by programs while implementing the Milestones into practice.

Similar findings were also reported in the current study. In free text responses regarding potential drawbacks of the AT Milestones, respondents described the education of stakeholders (i.e. preceptors, faculty, students) and overall buy-in as one of the largest obstacles to implementation. It was frequently reported that training of preceptors would require additional instruction and would take time. Other respondents noted that a lack of confidence in their preceptors’ ability to accurately score students using the AT Milestones. One faculty stated that, “when initiating new assessment programs, a common obstacle is educating the stakeholders and working towards consistence in the use of new instruments.” These types of responses reflected

those reported by Sorge et al. (2020) regarding program directors' perceptions of faculty understanding and residency Milestones. In this study, program directors and assistant program directors reported that nearly half of their core faculty (those responsible for student evaluation) had a "fair or poor" understanding of the milestones. This lack of confidence in preceptors on behalf of athletic training faculty could be a major limiting factor in the value of clinical education assessments. In previous research, preceptors and clinical evaluators have been reported as potential vulnerable links in assessment (Pangaro & ten Cate, 2013; Thompson et al., 2014). Athletic education programs are dependent on clinical educators or preceptors to aid in the immersive education of students. However, if there is a distrust or misunderstanding between faculty and preceptors, there is the potential for a much larger issue in athletic training education.

It is the responsibility of AT education programs to prepare and educate clinical instructors like preceptors on the use and implementation of assessments. It is also important that annual preceptor training is an inclusive learning experience focusing not only on policy and procedure, but also on teaching and assessment techniques (Cavallario, 2018; Nottingham, 2014b). The *ACGME Milestones Guide* clearly states that faculty development is essential to building an effective assessment program (Edgar et al., 2020).

A secondary purpose of this study was to explore how current clinical evaluations in athletic training education align with the principles of the AT Milestones. To evaluate this alignment an AT Milestones Alignment Criteria Score (ATMACS) was developed. With only four institutions participating in the clinical evaluation component, it is difficult to draw conclusions on the use of the scale or alignment to the AT Milestones. One of the anticipated hypotheses was that the majority of evaluations submitted would have a moderate to high association with the AT Milestones concepts. Of those institutions that provided clinical



evaluations, only one had a high association score of 80%. To further assess if clinical evaluations align with the AT Milestones, more assessments will need to be collected and use of the ATMAC scale to be tested.

With further testing and refinement of the ATMAC, the scale could be a useful instrument for programs to assess their own developed clinical assessments alignment to best practice tools like the AT Milestones. This could be an effective compromise in allowing programs autonomy while maintaining a standardized level of measurement. The adaptation and development of assessment in athletic training education has largely been a grassroots effort, established through the work of athletic trainers and faculty at distinct institutions.

If the goal of the educational transition for athletic training education is to better align with other allied health professions, we could see a movement toward national standardization of assessments like the ACGME Milestones (E. Holmboe et al., 2016). With changes in athletic training education programs, the Commission on Accreditation of Athletic Training Education (CAATE) could begin requiring documentation and reporting of assessments or Milestones. If a standardized assessment becomes a reporting requirement, many programs may experience similar growing pains reported in the medical education literature (Dzara et al., 2019). Overall, the findings support that faculty are generally to exceptionally satisfied with their current clinical evaluations; and that like the medical field may see both benefits and obstacles to using a Milestones-based assessment.

The current study found that overall faculty had a high satisfaction rating of their current clinical evaluations. The areas of highest satisfaction noted in the study were that the Milestones addressed content and their ease of use and length. Lower levels of satisfaction were noted for preceptor response and quality of feedback. The most notable benefits of the AT Milestones was

the ability to provide standardization and advancement through the learning continuum. Several faculty in this study noted concerns regarding time, length of the evaluation and educating stakeholders when using the AT Milestones. Furthermore, the clinical evaluation assessments of the participating institutions clinical evaluation assessments demonstrated an overall average alignment to the AT Milestones using the implemented scale.

### **Limitations**

Limitations are a part of every research study and this one is no exception. Several limitations were encountered during the current study. Data collection and survey administration for this study were performed during unprecedented times in a global pandemic. I was hopeful to get a response rate of 60-80%, however, one limitation of the current study is the low survey response rate (Henniger & Sung, 2012). During this time, faculty's primary communication networks were reduced primarily to electronic communication and email. Potential participants at the time the survey was administered may have been overwhelmed with emails and the demands of teaching through a virtual format. It is possible that role strain could have played a role in low survey response rates.

Additionally, this topic is still relatively new to the literature and field. A significant percentage (37%) of faculty respondents reported that they had a general understanding of the AT Milestones. However, only 16% reported they had an extensive understanding, while nearly a third of respondents (30%) reported that they had very little or no understanding of the AT Milestones. It is possible that perspective participants did not feel comfortable or knowledgeable enough to participate in the survey.

While limited in responses, the purpose of this research was to initiate a conversation and explore the perceptions of a new and impending topic in athletic training education assessment.

This study will contribute to the limited literature base on clinical assessments in athletic training education and may serve as a guide for administrators in developing assessments that best fit the needs of their respective program. This research study provides a base for continued growth and will help direct future research in this area.

### **Recommendations for Future Research**

There are a number of gaps in our knowledge surrounding assessment and athletic training education that follow from the findings from this study and would benefit from continued research.

1. Continued monitoring of programs implementing the AT Milestones is needed to begin capturing how the new assessments are being implemented and used, and how the data compares to previously assessments. Future research should investigate quantitative data from the comparisons, while qualitative analysis could investigate programs' experiences with the transition to a Milestones-based assessment.
2. With the development of the AT Milestones Alignment Criteria Score (ATMACS), the instrument has the potential to benefit many programs. With additional refinement and expert involvement and piloting, the scale could be useful as a program self-assessment instrument. The scale could be utilized to inform programs of gaps in their current curriculum and assessments, while also providing a guide to build a standardized assessment.
3. An important finding of this study highlighted the value of the faculty and preceptor relationship in clinical education. Future research should focus on identifying the missing link between faculty and preceptors in the area of assessment. Based on faculty responses, it appears there is an area of concern regarding preceptor

understanding and their abilities to adequately assess students in the clinical setting.

Investigating and improving these relationships could directly benefit students learning and program outcomes.

### **Conclusions**

To date, this is the first research exploring the use of the AT Milestones in athletic training education. The climate of athletic training education is changing, together with the way we evaluate student's readiness to enter the field. The AT Milestones may offer a path for programs to model evaluations. However, with change often comes challenge. Many programs may face challenges associated with implementing new assessment instruments into practice.

As indicated in the responses, faculty expressed concerns about the AT Milestones and involving stakeholders in the evaluation process. Previous research in this area has expressed the importance of investing in the education of members using the assessments (Friedman et al., 2014; Kuo et al., 2015; Meier et al., 2016). Supplemental trainings and educational sessions may be required to ensure that all parties are informed and prepared to use any new program assessment.

In addition, Milestones-based assessments are by nature longer in length and involves feedback in the form of narratives. A Milestones-based assessment will likely take additional time on the part of the preceptor with grading and to provide quality feedback. Like many professions that rely on clinical experiences, athletic training relies on preceptors working in the clinical setting to help educate and evaluate students. It is important that their time is respected and valued.

Athletic training education is in a transitional period and where challenges also offer programs the opportunity to implement change. More research is needed to continue exploring these changes and provide faculty with the resources to develop best-practice assessments.

## REFERENCES

- About*. (n.d.). CAATE. <https://caate.net/about/>
- Ambegaonkar, J. P., Caswell, S., & Caswell, A. (2012). Relationship Between Approved Clinical Instructors' Assessment of Athletic Training Student Clinical Performance and Their Clinical Grade. *Athletic Training Education Journal*, 7(4), 152–156.  
<https://doi.org/10.4085/0704152>
- Armijo Olivo, S., Macedo, L. G., Gadotti, I. C., Fuentes, J., Stanton, T., & Magee, D. J. (2008). Scales to assess the quality of randomized controlled trials: A systematic review. *Physical Therapy*, 88(2), 156–175. <https://doi.org/10.2522/ptj.20070147>
- Athletic Training Education Overview*. (n.d.). National Athletic Trainers' Association.  
<https://www.nata.org/sites/default/files/education-overview.pdf>
- Becoming an athletic trainer*. (n.d.). CAATE. <https://caate.net/becoming-an-athletic-trainer/>
- Bloom, B. S. (1968). Learning for Mastery. Instruction and Curriculum. Regional Education Laboratory for the Carolinas and Virginia, Topical Papers and Reprints, Number 1. *Evaluation Comment*, 1(2). <https://eric.ed.gov/?id=ED053419>
- Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, D. R. (1956). *Taxonomy of educational objectives: The classification of educational goals*. David McKay Company. <https://www.uky.edu/~rsand1/china2018/texts/Bloom%20et%20al%20-Taxonomy%20of%20Educational%20Objectives.pdf>
- Bowman, T. G., Mazerolle, S. M., & Barrett, J. L. (2017). Professional master's athletic training programs use clinical education to facilitate transition to practice. *Athletic Training Education Journal*, 12(2), 146–151. <https://doi.org/10.4085/1202146>

- Bowman, T. G., Pitney, W. A., Mazerolle, S. M., & Dodge, T. M. (2015). Description of professional master's athletic training programs. *Athletic Training Education Journal*, *10*(1), 39–46. <https://doi.org/10.4085/100139>
- Boynton, P. M., & Greenhalgh, T. (2004). Selecting, designing, and developing your questionnaire. *BMJ*, *328*(7451), 1312–1315. <https://doi.org/10.1136/bmj.328.7451.1312>
- Burton, L. J., & Mazerolle, S. M. (2011). Survey instrument validity part I: Principles of survey instrument development and validation in athletic training education research. *Athletic Training Education Journal*, *6*(1), 27–35.
- CAATE. (2018). *Implementation and Guide to the CAATE 2020 Professional Standards* (pp. 1–44). <https://caate.net/wp-content/uploads/2019/08/Guide-to-2020-Standards-7-15-2019-2.pdf>
- Cavallario, J. M., Van Lunen, B. L., Hoch, J. M., Hoch, M., Manspeaker, S. A., & Pribesh, S. (2018). Athletic training student core competency implementation during patient encounters. *Journal of Athletic Training*, *53*(3), 282–291. <https://doi.org/10.4085/1062-6050-314-16>
- Cavanagh, S. (1997). Content analysis: Concepts, methods and applications: Content analysis is a flexible methodology that is particularly useful to nurse researchers, asserts Stephen Cavanagh. *Nurse Researcher*, *4*(3), 5–16.
- Cooke, M., Irby, D. M., & O'Brien, B. C. (2010). *Educating physicians. A call for reform of medical school and residency*. Jossey-Bass.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE.

- Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed.). SAGE.
- Curry, L., & Docherty, M. (2017). Implementing competency-based education. *Collected Essays on Learning and Teaching*, 10, 61. <https://doi.org/10.22329/celt.v10i0.4716>
- Dodge, T. M., Walker, S. E., & Laursen, R. M. (2009). Promoting coherence in athletic training education programs. *Athletic Training Education Journal*, 4(2), 46–51.
- Dongre, A. R., Deshmukh, P. R., Kalaiselvan, G., & Upadhyaya, S. (2009). Application of Qualitative Methods in Health Research: An Overview. *Online Journal of Health and Allied Sciences*, 8(4), 1–5.
- Dzara, K., Huth, K., Kesselheim, J. C., & Schumacher, D. J. (2019). Rising to the challenge: Residency programs' experience with implementing milestones-based assessment. *Journal of Graduate Medical Education*, 11(4), 439–446. <http://dx.doi.org/10.4300/JGME-D-18-00717.1>
- Eberman, L. E., & Kahanov, L. (2011). Defining outcomes and creating assessment tools for AT education, Part 2. *International Journal of Athletic Therapy & Training*, 16(1), 37–41.
- Edgar, L., McLean, S., Hogan, S. O., Hamstra, S., & Holmboe, E. S. (2020). *ACGME: The Milestones Guidebook Version 2020* (pp. 1–39). Accreditation Council for Graduate Medical Education. <https://www.acgme.org/globalassets/milestonesguidebook.pdf>
- Edgar, L., Roberts, S., & Holmboe, E. (2018). Refining the milestones for assessment of professionalism skills. *Journal of Graduate Medical Education*, 10(3), 367–369. <https://doi.org/10.4300/JGME-D-18-00372.1>
- Edler, J. R., Eberman, L. E., & Walker, S. (2017). Clinical education in athletic training. *Athletic Training Education Journal*, 12(1), 46–50. <https://doi.org/10.4085/120146>



- Fetters, M. D., Curry, L. A., & Creswell, J. W. (2013). Achieving integration in mixed methods designs—Principles and practices. *Health Services Research, 48*(6pt2), 2134–2156. <https://doi.org/10.1111/1475-6773.12117>
- Fogli, J., & Herkenhoff, L. (2018). *Conducting Survey Research: A Practical Guide* (1st ed.). Business Expert Press.
- Friedman, K. A., Balwan, S., Cacace, F., Katona, K., Sunday, S., & Chaudhry, S. (2014). Impact on house staff evaluation scores when changing from a Dreyfus- to a Milestone-based evaluation model: One internal medicine residency program’s findings. *Medical Education Online, 19*(1), 25185. <https://doi.org/10.3402/meo.v19.25185>
- Gardner, A. K., Scott, D. J., Choti, M. A., & Mansour, J. C. (2015). Developing a comprehensive residency education evaluation system in the era of milestone assessment. *Journal of Surgical Education, 72*(4), 618–624. <http://dx.doi.org/10.1016/j.jsurg.2014.12.007>
- Garfolo, B. T., & L’Huillier, B. (2016). Competency based education (CBE): Baby steps for the United States. *Academy of Business Research, 1*, 98–112. <https://doi.org/10.1002/cbe2.1047>
- Geisler, P. R., & Lazenby, T. W. (2009). Clinical reasoning in athletic training education: Modeling expert thinking. *Athletic Training Education Journal, 4*(2), 52–65.
- Gervais, J. (2016). The operational definition of competency-based education. *Competency-Based Education, 1*(2), 98–106. <https://doi.org/10.1002/cbe2.1011>
- Haynes, S. N., Richard, D. C. S., & Kubany, E. S. (1995). Content validity in psychological assessment: A functional approach to concepts and methods. *Psychological Assessment, 7*(3), 238–247. <https://doi.org/10.1037/1040-3590.7.3.238>

- Henniger, A., & Sung, H.-E. (2012). Mail survey in social research. In L. Gideon (Ed.), *Handbook of survey methodology for social sciences*. Springer.
- Holmboe, E., Edgar, Laura, & Hamstra, Stan. (2016). *ACGME: The Milestones Guidebook Version 2016* (pp. 1–41).  
<https://www.acgme.org/Portals/0/MilestonesGuidebook.pdf?ver=2016-05-31-113245-103>
- Holmboe, E. S., Sherbino, J., Long, D. M., Swing, S. R., Frank, J. R., & for the International CBME Collaborators. (2010). The role of assessment in competency-based medical education. *Medical Teacher*, *32*(8), 676–682.  
<https://doi.org/10.3109/0142159X.2010.500704>
- Hsieh, H.-F., & Shannon, S. E. (2005). Three pproaches to qualitative content analysis. *Qualitative Health Research*, *15*, 1277–1288.
- Iobst, W. F. (2015). Building the Plane As We Fly It. *Journal of Graduate Medical Education*, *7*(2), 259–261. <https://doi.org/10.4300/JGME-D-15-00095.1>
- Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, *33*(7), 14–26.  
<https://doi.org/10.3102/0013189X033007014>
- Kahanov, L., & Eberman, L. E. (2010). Defining outcomes and creating assessment tools for AT education, Part I. *Athletic Therapy Today*, *15*(6), 41–44.
- Kamper, S. J., Moseley, A. M., Herbert, R. D., Maher, C. G., Elkins, M. R., & Sherrington, C. (2015). 15 years of tracking physiotherapy evidence on PEDro, where are we now? *British Journal of Sports Medicine*, *49*(14), 907–909. <https://doi.org/10.1136/bjsports-2014-094468>

- Kay, M. C., & Kucera, K. L. (2018). Mixed methods designs for sports medicine reserach. *Clinical Sports Medicine*, 37, 401–312.
- Keeney, S., Hasson, F., & McKenna, H. (2011). *The delphi technique in nursing and health research*. Wiley-Blackwell.
- Kothari, L. G., Shah, K., & Barach, P. (2017). Simulation based medical education in graduate medical education training and assessment programs. *Progress in Pediatric Cardiology*, 44, 33–42. <http://dx.doi.org/10.1016/j.ppedcard.2017.02.001>
- Krosnick, J. A., Lavrakas, P. J., & Nuri, K. (2014). Survey research. In *Handbook of research methods in social and personality psychology* (2nd ed.). Cambridge University Press.
- Kuo, L. E., Hoffman, R. L., Morris, J. B., Williams, N. N., Malachesky, M., Huth, L. E., & Kelz, R. R. (2015). A milestone-based evaluation system- The cure for grade inflation? *Journal of Surgical Education*, 72(6), e218-225. <https://doi.org/10.1016/j.jsurg.2015.09.012Pi>
- Mace, K., & Welch, C. E. (2019). The future of health professions education: Considerations for competency-based education in athletic training. *Athletic Training Education Journal*, 14(3), 215–222. <https://doi.org/10.4085/1403215>
- Maher, C. G., Sherrington, C., Herbert, R. D., Moseley, A. M., & Elkins, M. (2003). Reliability of the PEDro scale for rating quality of randomized controlled trials. *Physical Therapy*, 83(8), 713–721. <https://doi.org/10.1093/ptj/83.8.713>
- Mazerolle, S. M., Bowman, T. G., & Dodge, T. M. (2014a). Athletic training student socialization part I: Socializing students in undergraduate athletic training programs. *Athletic Training Education Journal*, 9(2), 72–79. <https://doi.org/10.4085/090272>

- Mazerolle, S. M., Bowman, T. G., & Dodge, T. M. (2014b). Athletic training student socialization part II: Socializing the professional master's athletic training student. *Athletic Training Education Journal*, 9(2), 80–86. <https://doi.org/10.4085/090280>
- Meier, A., Gruessner, A., & Cooney, R. N. (2016). Using the ACGME Milestones for Resident Self-Evaluation and Faculty Engagement. *Journal of Surgical Education*, 73(6), e151-157. <http://dx.doi.org/10.1016/j.jsurg.2016.09.001>
- Moffit, D. M., Mansell, J. L., & Russ, A. C. (2016). A systematic approach to programmatic assessment. *Athletic Training Education Journal*, 11(3), 161–167. <https://doi.org/10.4085/1103161>
- Momeni, A., Pincus, M., & Libien, J. (2018). *Introduction to statistical methods in pathology*. Springer.
- Morcke, A. M., Dornan, T., & Eika, B. (2013). Outcome (competency) based education: An exploration of its origins, theoretical basis, and empirical evidence. *Advance in Health Science Education*, 18, 851–863. <https://doi.org/10.1007/s10459-012-9405-9>
- Newman, I., Newman, D., & Newman, C. (2011). Writing research articles using mixed methods. In T. S. Rocco & T. Hatcher (Eds.), *The handbook of scholarly writing and publishing* (pp. 191–208). Jossey-Bass.
- Nodine, T. R. (2016). How did we get here? A brief history of competency-based education in the United States. *Competency-Based Education*, 1(5), 5–11. <https://doi.org/10.1002/cbe2.1004>
- Pangaro, L., & ten Cate, O. (2013). Frameworks for learner assessment in medicine: AMEE Guide No. 78. *Medical Teacher*, 35(6), e1197-1210.

- Perrin, D. H. (2015). Seeking Greater Relevance for Athletic Training Education Within American Higher Education and the Health Care Professions. *Athletic Training Education Journal*, 10(4), 323–328. <https://doi.org/10.4085/1004323>
- Pitney, W. A. (2012). Requiring professional athletic training programs at the post-baccalaureate level: Considerations and concerns. *Athletic Training Education Journal*, 7(1), 4–10. <https://doi.org/10.5608/070104>
- Pitney, W. A., & Parker, J. (2001). Qualitative Inquiry in Athletic Training: Principles, Possibilities, and Promises. *Journal of Athletic Training*, 36(2), 185–189.
- Prasad, B. D. (2019). Qualitative content analysis: Why is it still a path less taken? *Forum: Qualitative Social Research*, 20(3), 1–21. <https://doi.org/10.17169/fqs-20.3.3392>
- Prentice, W. E. (2013, September). Is a transition to the entry-level master's degree really the best choice for the profession. *NATA News*, 25(8), 10–11.
- Richardson, R. (2013). *Professional Education In Athletic Training* (p. 25). [https://www.nata.org/sites/default/files/The\\_Professional\\_Degree\\_in\\_Athletic\\_Training.pdf](https://www.nata.org/sites/default/files/The_Professional_Degree_in_Athletic_Training.pdf)
- Rothgeb, J. M. (2008). Pilot Test. In P. J. Lavrakas (Ed.), *Encyclopedia of survey research methods* (pp. 584–585). SAGE.
- Salkind, N. J. (2017). *Statistics for people who (think they) hate statistics* (6th ed.). SAGE.
- Schilling, J. F. (2012). Quality of Instruments Used to Assess Competencies in Athletic Training. *Athletic Training Education Journal*, 7(4), 187–197. <https://doi.org/10.4085/0704187>
- Schilling, J. F., & Koetting, R. (2010). Underpinnings of competency-based education. *Athletic Training Education Journal*, 5(4), 165–169.

- Sorge, R., Li-Sauerwine, S., Fernandez, J., & Hern, G. (2020). How well do core faculty understand the emergency medicine milestones. *Western Journal of Emergency Medicine*, 21(1), 160–162. <https://doi.org/10.5811/westjem.2019.11.44289>
- Strategic Alliance Degree Statement*. (2015, May 20).  
<https://www.atstrategicalliance.org/strategic-alliance-degree-statement>
- The Athletic Training Milestones Project*. (n.d.). Retrieved January 14, 2020, from  
<http://www.atmilestones.com/>
- Thompson, G. A., Moss, R., & Applegate, B. (2014). Using performance assessment to determine competence in clinical athletic training education: How valid are our assessments? *Athletic Training Education Journal*, 9(3), 135–141.  
<https://doi.org/10.4085/0903135>
- Turnbull, J., MacFadyen, J., van Barneveld, C., & Norman, G. (2000). Clinical work sampling: A new approach to the problem of in-training evaluation. *Journal of General Internal Medicine*, 15(8), 556–561.
- Turocy, P. S. (2002). Survey research in athletic training: The scientific method of development and implementation. *Journal of Athletic Training*, 37(4 suppl), S-174-S-179.
- Tyler, R. W. (1976). *Perspectives on American education: Reflections on the past... Challenges for the futuer*. Science Research Associates.
- Verhagen, A. P., H. C., de V., R. A., de B., A. G., K., M., B., L. M., B., & P. G., K. (1998). The Delphi List: A Criteria List for Quality Assessment of Randomized Clinical Trials for Conducting Systematic Reviews Developed by Delphi Consensus. *Journal of Clinical Epidemiology*, 51(12), 1235–1241.

Weidner, T. G., & Henning, J. M. (2004). Development of standards and criteria for the selection, training, and evaluation of athletic training approved clinical instructors. *Journal of Athletic Training*, 39(4), 335–343.

APPENDIX A: AT MILESTONES QUESTIONNAIRE

1. What is your role in your athletic training education program?
  - a. Director or Program Chair
  - b. Clinical Coordinator
  - c. Faculty
  - d. Other \_\_\_\_\_
  
2. What is the current status of your athletic training education program?
  - a. Good Standing
  - b. Probation
  - c. In-transition
  - d. Voluntary Withdrawal
  - e. Seeking Accreditation
  
3. What degrees does your athletic training education program currently offer?  
(Select all that apply)
  - a. Baccalaureate (B.S./ B.A.)
  - b. Professional Master's (M.A.T.)
  - c. Post-professional Master's (M.S.)
  - d. Doctor of Athletic Training (D.A.T)
  - e. Specialty Residency
  
4. What stakeholders were involved in the development of your current clinical evaluation.  
(Select all that apply)
  - a. Faculty
  - b. Preceptors
  - c. Students
  - d. University Assessment Group
  - e. Other \_\_\_\_\_
  
5. What is your level of satisfaction with each of the following aspects of your program's current clinical evaluations?

	Very dissatisfied (1)	Dissatisfied (2)	Unsure (3)	Satisfied (4)	Very satisfied (5)
(a) Length of evaluation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(b) Ease of use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(c) Preceptor response	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(d) Type of feedback (i.e. numeric responses or narratives)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(e) Quality of feedback (i.e. descriptive, transparent, informative)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



	Very dissatisfied (1)	Dissatisfied (2)	Unsure (3)	Satisfied (4)	Very satisfied (5)
(f) Method of delivery (i.e. paper or electronic)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(g) Content being addressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(h) Overall satisfaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. What information do you feel is most valuable for *faculty* in a clinical evaluation assessment?

7. What information do you feel is most valuable for *students* in a clinical evaluation assessment?

8. In response to the implementation of the 2020 CAATE standards, have you, or is your program, planning to revise current clinical evaluation assessments?

- a. Yes, have made revisions
- b. Yes, planning on making revisions
- c. No
- d. Undecided at this time

9. What is your understanding of the AT Milestones Project?

- a. None (if none, respondent will skip to end)
- b. Very little understanding
- c. A general understanding
- d. An extensive understanding

10. In your program, do you think that you will use the AT Milestones as a guideline for clinical competency assessments? (i.e. proficiencies, practicals, or clinical evaluations)

- a. No, and do not plan on using for implementation
- b. No, not at this time
- c. Unsure
- d. Yes, we have developed a plan for implementation
- e. Yes, we are currently implementing for assessments

11. How might your program benefit from using Milestones-based assessments?

12. What are the potential drawbacks of using Milestones-based assessments in your program?

--

**Introduction for clinical evaluation document component:**

Thank-you for completing this portion of the questionnaire. The following portion of the survey is voluntary and is not required for your previous responses to be recorded.

As an investigator, I want to explore how current athletic training clinical evaluations align with the AT Milestones project. I am asking participants who are able to submit a copy of their program's current clinical evaluation(s). If you are not able to upload or submit the documents at this time but are still interested in participating, I am able to accept submissions via email. My contact information can be found at the bottom of the page.

All program identifiers will be removed by a member of the research team prior to data analyses. This portion of the project is in no way a critique of program's clinical evaluations and is only intended to better understand current practices in athletic training education assessment. Data will be analyzed based on the following general criteria:

- 1) correlating competency & sub-competency
- 2) consistent AT Milestones terminology
- 3) used across the program for addressing the learning continuum
- 4) consistent AT Milestones level scoring
- 5) addresses all six AT Milestones core competencies
- 6) narrative component of direct observation
- 7) contains a student self-evaluation component
- 8) contains an action plan component
- 9) includes input from multiple scorers or evaluators
- 10) designed to be used for long-term rotations (3 months or longer)

## APPENDIX B: PARTICIPANT CONSENT FORM

You are being asked to participate in a research study conducted by Chelsey Bruns under the supervision of Dr. Steve Mertens of the Teaching and Learning Department at Illinois State University. The purpose of this study is to examine athletic training educators' perceptions of current clinical evaluation assessments, and program evaluations' alignment to the AT Milestones project.

### **Why are you being asked?**

You have been asked to participate in this research because you are a faculty member in a CAATE accredited athletic training education program. Your participation in this study is voluntary. You will not be penalized if you choose to skip parts of the study, not participate, or withdraw from the study at any time.

### **What would you do?**

If you choose to participate in this study, you will be asked to provide your opinion about current clinical evaluations and your knowledge of the AT Milestones project. In total, your involvement in this study will last approximately c,15- 20 minutes.

### **Are any risks expected?**

We do not anticipate any risks beyond those that would occur in everyday life.

### **Will your information be protected?**

Your responses will be anonymous; nothing that will identify you will be linked to your responses. The findings from this study may be presented in conferences, meetings, and publications. When these findings are presented, your responses will be combined with the responses of other participants.

### **Who will benefit from this study?**

While you may not directly benefit from this study, your responses will help inform best research practices and develop guidelines for future athletic training education assessments.

### **Whom do you contact if you have any questions?**

If you have any questions about the research or wish to withdraw from the study, contact

Chelsey Bruns at [cabrun@ilstu.edu](mailto:cabrun@ilstu.edu) or Dr. Steven Mertens at [smerten@ilstu.edu](mailto:smerten@ilstu.edu).

---

If you have any questions about your rights as a participant, or if you feel you have been placed at risk, contact the Illinois State University Research Ethics & Compliance Office at (309) 438-5527 or [IRB@ilstu.edu](mailto:IRB@ilstu.edu).

### **Documentation of Consent**

Sign below if you are 18 or older and willing to participate in this study.

If a signed form is not being obtained, a description of what the participant would need to do to

indicate consent should be described above and a method for them to indicate consent (i.e. typing in their name, checking a box, or clicking next) should replace the signature line below. A waiver of documentation of informed consent should also be requested if a physical signature is not being obtained.

Signature \_\_\_\_\_ Date \_\_\_\_\_

You can print this form for your records.

APPENDIX C: VALUE RECORDED RESPONSES

*Information Reported as Most Valuable in Clinical Evaluation Assessments*

	N	%
<i>Faculty</i>		
Professionalism/ Soft Skills/ Skills	12	19.4
Competence	8	12.9
Feedback	7	11.3
Deficits or Weaknesses	7	11.3
Transfer of Knowledge	6	9.7
Critical Decision Making	5	8.1
Student Progression	5	8.1
Understanding	1	1.6
Real Time Performance	1	1.6
Exposure	1	1.6
Safety	1	1.6
Success	1	1.6
Narratives	1	1.6
Proficiency	1	1.6
Student needs	1	1.6
Implementation	1	1.6
Ease of Use	1	1.6
Student Understanding	1	1.6
Student Needs	1	1.6
Total	62	100.0
<i>Students</i>		
Feedback	17	25.8
Areas of improvement	9	13.6
Development	5	7.6
Growth and Progress	5	7.6
Performance and Behavior	4	6.1
Reflection	3	4.5
Competency and Proficiency	3	4.5
Transfer of Knowledge	2	3.0
Goals	2	3.0

	N	%
Grades or Scores	2	3.0
Exposure	1	1.5
Outcomes	1	1.5
Performance Direction	1	1.5
Consistency	1	1.5
Knowledge	1	1.5
Clarity of Content	1	1.5
Independent Practice	1	1.5
Assessment of Preceptor	1	1.5
Assessment of Clinical Site	1	1.5
Clinical Decision Making	1	1.5
Easy to Understand	1	1.5
Useful	1	1.5
Application	1	1.5
Total	66	100.0

APPENDIX D: BENEFITS AND DRAWBACKS RECORDED RESPONSES

	N	%
<i>Benefits</i>		
Development across the continuum	7	14.2
Standardized	4	8.2
Specific	4	8.2
Competency/ Proficiency	4	8.2
Progression	3	6.1
Consistency	3	6.1
Framework/ Guidance	3	6.1
Shared Understanding	3	6.1
Feedback	2	4.1
Relevance	2	4.1
Unsure/ Unsure at this time	2	4.1
Goals and Objectives	1	2.0
Student Placements (clinical)	1	2.0
Measurement	1	2.0
Clear Criteria	1	2.0
Language	1	2.0
Self-assessment	1	2.0
Good if a new program	1	2.0
Do not use	1	2.0
Total	49	100.0
<i>Drawbacks</i>		
Educating Preceptors/Faculty/Students	5	13.5
Preceptor/Faculty Understanding or Buy-in	5	10.8
Time to Complete	4	10.8
Length of Assessment	3	8.1
Too Specific or Too Much Information	3	8.1
Need a digital platform	2	5.4
Inflexible	2	5.4
Correlation with Outcomes	2	5.4
Difficult to Grade or Assess	1	2.7
Paradigm Shift	1	2.7

	N	%
Imbalance	1	2.7
Gaps in components	1	2.7
Requires Restructuring	1	2.7
Addressing standards	1	2.7
Consistency	1	2.7
Application	1	2.7
Too Specific	1	2.7
Too much information	1	2.7
?	1	2.7
Total	37	100.0



APPENDIX E: AT MILESTONES ALIGNMENT CRITERIA SCORE

*AT Milestones Alignment Criteria Score- ATMACS*

1. Each evaluation item contains a correlating competency & sub-competency?	Yes/No
2. Does the evaluation use consistent AT Milestones terminology?	Yes/No
3. Is this evaluation instrument used across the program for addressing the learning continuum?	Yes/No
4. Does the evaluation use consistent AT Milestones level scoring?	Yes/No
5. Does the evaluation address all six AT Milestones core competencies?	Yes/No
6. Does the evaluation contain a narrative component of direct observation?	Yes/No
7. Does the evaluation contain a student self-evaluation component?	Yes/No
8. Does the evaluation contain an <u>action plan</u> component based on feedback or narrative section?	Yes/No
9. Does the evaluation include input from multiple scorers or evaluators (i.e., faculty/preceptor)?	Yes/No
10. Is the evaluation designed to be used for long-term rotations (3 mo. or longer)?	Yes/No
	Score 10