

The Future of Health Professions Education: Considerations for Competency-Based Education in Athletic Training

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Context: Competency-based education (CBE) has been in existence in the landscape of educating health professionals since the 1970s. Despite this, there is significant variability in how CBE is defined in publication, practice, and conversation. This variability has likely contributed to common misconceptions about what it means for an educational system to be competency based, how such a system would operate, and the prevalence of these systems in current practices.

Objective: To define CBE through a discussion of its evolution in health professions education and discuss considerations for its role in the education of athletic trainers (ATs).

Background: The CBE framework has solidified its place in medical education to address the need for health care professionals to provide care that is safe, effective, and responsive to patient beliefs, values, and circumstances. These same necessities exist in athletic training practice. However, CBE does not yet have a solid place in the preparation of ATs, nor does it seem to be well understood by educators in the field.

Recommendations: Athletic training educators should be familiar with CBE as an educational framework that is fundamentally flexible and outcome oriented. Flexible practices allow for progression based on learner capability, opportunistic content delivery, and variable timing for assessments. Components of CBE that are outcome centric emphasize preparedness to practice and purposeful location selection for formative assessments. Further, it is important to avoid misusing the phrase *CBE* as a means to describe any aspect of learning that pertains to competence, competency, or competencies.

Conclusions: To hold and maintain a place in the larger context of health care, athletic training educators should have a firm grasp on the concepts and practices of CBE. Future areas of scholarship should identify strategies to incorporate CBE into athletic training education and determine its effect on patient care.

Key Words: Health care education, outcomes-based education, individualized learning, curriculum models

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KEY POINTS

- A clear and succinct definition of competency-based education may promote better understanding of the theory and an improved ability for educators to incorporate its concepts into practice. A competency-based approach to education is one that is fundamentally flexible and outcome centric.
- A flexible approach encourages variability between students and experiences, allowing all stakeholders in the educational process to provide learning opportunities based on individual circumstances.
- An outcome centric approach encourages the use of ability to practice healthcare as a marker for success and discourages the use of traditional alphanumeric grading.

INTRODUCTION

As global initiatives continue to shift health care towards a patient-centered, outcome-driven model, it is crucial to prepare future clinicians who can acclimate to the evolving health care landscape. More specifically, future generations of health care professionals must not only be responsive to the needs of the populations they serve but also able to meet the needs of the health care systems in which they practice.^{1,2} To do so, graduates of health professions education programs must be able to think critically and apply knowledge that is medically, socially, and culturally competent. For educators, this will require close examination of how best to deliver educational content and assess student ability.

Shifting the educational landscape to a competency-based framework has been gaining significant popularity in health professions education over the past 20 years.^{3,4} In a recent study, more than 70% of athletic training educators recognized that competency-based education (CBE) may provide a mechanism for smoother transition to practice.⁵ However, because of the overall lack of literature pertaining to the role of CBE in athletic training, little is known about the feasibility of a CBE model in athletic training. Further, some educators believe that athletic training already functions in a competency-based framework,⁵ and this lack of familiarity may be inflating some of the most common misconceptions of CBE. Therefore, the objectives of this paper are to (1) describe the history and evolution of CBE in health professions education, (2) define CBE and debunk some common misconceptions, and (3) discuss considerations for CBE in athletic training.

EMERGENCE OF A COMPETENCY-BASED APPROACH

The notion of CBE in health care is not new. The framework for a medical education system centered on competency achievement was originally proposed in a 1978 publication by the World Health Organization.⁶ This monograph compared traditional subject-centered curricula with competency-based curricula and highlighted several discrepancies that existed between medical education and the requirements of clinical

practice. The authors claimed that shifting to a CBE model could produce clinicians proficiently able to meet patient needs. Unfortunately, early attempts to implement the CBE framework failed because of the difficulty of establishing objective mechanisms to assess student competence.⁷

The possibility for a competency-based approach to health care education did not formally emerge again until 1999 when the Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Medical Specialists mandated a shift to an outcomes-based model for graduate medical education.⁸ This mandate, in response to public concerns about health care quality, indicated that graduates must be competent in areas of clinical practice beyond patient care skills and medical knowledge. Concurrently, the Institute of Medicine (IOM; now the National Academy of Medicine) published *To Err is Human: Building a Safer Health System*,⁹ which was one of the first publications to bring attention to the prevalence of medical errors in the United States. A little more than a year later, the same group published *Crossing the Quality Chasm: A New Health System for the 21st Century*,¹⁰ which highlighted the need to ensure patients receive care that is safe, effective, efficient, equitable, timely, and patient centered. Whereas *To Err is Human* focused mostly on improved government and system regulation, *Crossing the Quality Chasm* placed a larger emphasis on improving education and training for health care practitioners, with a stated vision that

all health professionals should be educated to deliver patient-centered care as members of an interdisciplinary team, emphasizing evidence-based practice, quality improvement approaches, and informatics.^{10(p3)}

To address the vision identified in *Crossing the Quality Chasm*, the IOM proposed 5 competency areas that all health care practitioners should embody regardless of discipline.¹¹ Simultaneously, the ACGME announced 6 similar core areas in which medical residents should be competent upon entering residency.^{8,12} Table 1 displays the core areas identified by the IOM and ACGME. Although these core areas have been widely adopted across health care over the past 2 decades,^{12,13} these original publications did not provide strategies or tactics for educators attempting to incorporate them into education programs.

Although some view CBE as one such strategy to weave these concepts into health care education, converting broad competencies into measurable attributes has been identified as a primary challenge to the implementation of CBE.^{14–18} To address barriers with competency assessment, subcompetencies, milestones, and entrustable professional activities have emerged.^{19–23} Although all of these can be used to assess students in a competency-based model, none truly define CBE. Further, simply incorporating any or all of these practices into a curriculum does not make that curriculum competency based. As this manuscript primarily aims to provide a common understanding of CBE, a thorough

Table 1. Core Competency Areas Identified by the Institute of Medicine and the Accreditation Council for Graduate Medical Education^a

Institute of Medicine	Accreditation Council for Graduate Medical Education
Patient-centered care	Practice-based learning and improvement
Interprofessional practice/education	Patient care and procedural skills
Evidence-based practice	Systems-based practice
Quality improvement	Medical knowledge
Health care informatics	Interpersonal and communication skills
Professionalism	Professionalism

^a The Institute of Medicine is now the National Academy of Medicine.

discussion of these specific assessment practices is outside the current scope.

COMMON MISCONCEPTIONS ABOUT CBE

One of the challenges associated with discussing CBE is that many see or hear the topic and believe they already understand it fully. The simplicity of the name “competency-based education” incorrectly suggests to many that it is one of 3 things: (1) an educational system grounded by individual skills (ie, competencies), (2) a means to determine student readiness to practice (ie, competence), or (3) a combination of both. Therefore, in addition to providing an accurate definition of CBE, it is also worthwhile to dispel some of the common misconceptions about it.

Misconception #1: Athletic Training Has Already Adopted CBE

In 2018, researchers reported that only 10.4% of 163 athletic training educators surveyed correctly identified that athletic training education does not currently function in a CBE model, minimally suggesting misunderstanding of key CBE concepts and principles.⁵ Review of existing educational programs, along with discussions with Commission on Accreditation of Athletic Training Education (CAATE) officials, suggests that as of April 2019 there are no true CBE programs in existence in athletic training.²⁴ One potential reason for this misconception is a marked overuse of words like *competence*, *competent*, and *competency*. Broadly, competencies are the intended outcomes of the educational process, whereas being competent or demonstrating competence denotes the presence of certain actions or behaviors.^{3,25} These words should not be used interchangeably, and, perhaps more important, simply using these words within an educational model does not make it competency based.^{3,26} The nomenclature athletic training has been using since the beginning of structured professional education has included “competencies,” which has likely contributed to the belief that competency-based athletic training education programs already exist.²⁷ Liberal discretions with words rooted in *competence* only further complicate the available information and lead to misconceptions about the current state of implementation.

Misconception #2: CBE Is a Series of Checklists

Competency-based education is often misconstrued for an educational framework that is based on a master list of tangible skills. For many in professional athletic training programs, the idea of a competency-based approach conjures up images of proficiencies and checklists. Historically,

checklists have been used predominately in athletic training education to identify the specific skills in which a student must demonstrate proficiency (eg, knee evaluation, thermal ultrasound application, blood pressure assessment), as well as to label every step a student must demonstrate within any given skill (eg, wash hands, introduce yourself, take history). Although checklists may be used to assess a student’s ability to perform curricular skills identified in the *Athletic Training Education Competencies*²⁷ and the upcoming *2020 Curricular Content Standards*,²⁸ checklists such as these are not a foundational part of CBE.

Misconception #3: Every Program Functioning in a Competency-Based Model Is the Same

In professional athletic training education, the term competency is most often associated with the educational competencies as identified in the numerous editions of the National Athletic Trainers’ Association’s *Athletic Training Education Competencies*.²⁷ Furthermore, with the inclusion of the core competencies in all CAATE accreditation standards documents for professional degree,²⁹ postprofessional degree,³⁰ and postprofessional residency programs,³¹ educators may simply align education grounded by competency with the core competencies. However, CBE is not synonymous with teaching the 6 core competencies. Although it is imperative that clinicians entering the workforce be prepared to practice health care using each of these core competencies, simply teaching, assessing, or considering these competencies is not CBE.

DEFINING FEATURES OF CBE

Although these misconceptions about CBE are common among educators,^{19,26} they will be ousted only by establishing and encouraging the use of accurate definitions. In 2010, recognizing confusion with the term CBE in the literature, Frank et al³² conducted a systematic review of 173 sources in an effort to define CBE. The authors concluded their work by proposing a complete definition of CBE:

Competency-based education (CBE) is an approach to preparing physicians for practice that is fundamentally oriented to graduate outcome abilities and organized around competencies derived from an analysis of societal and patient needs. It de-emphasizes time-based training and promises greater accountability, flexibility, and learner-centeredness.^{32(p636)}

Although this definition is a synthesis of extensive literature review done by this research team, it may lack an approachability necessary for educators not fully immersed in pedagogical theory literature and does not highlight the role

Table 2. Comparison of Flexible and Outcome-Centric Nature of Competency-Based Education and a Traditional Education Framework

	Feature	Competency-Based Education	Traditional Education
Flexible	Determinant for progression	Capability Successful completion of program-specific markers Example: Student able to provide care for patients with spine injuries because understanding has been demonstrated in both didactic setting and clinical education opportunities.	Time Successful completion of a fixed number of semesters Example: Student able to provide care for patients with spine injuries because the semester during which spine content is taught has ended.
	Timing of content delivery	Opportunistic Driven by any educational stakeholder Example: Evaluation and treatment about health conditions related to the knee joint are taught in conjunction with a clinical experience during which a student is evaluating and treating many patients with health conditions related to the knee joint.	Fixed Driven by instructor Example: Evaluation and treatment about health conditions related to the knee joint are taught during the second semester of the first year.
	Assessment timing	Variable <ul style="list-style-type: none"> • Independent of content delivery • Influenced by student-perceived preparedness • Dependent on clinical exposure to content 	Predetermined <ul style="list-style-type: none"> • Dependent on content delivery • Not influenced by student-perceived preparedness • Independent of clinical exposure to content
Outcome centric	Emphasis in learning	Preparedness to practice Predicated on the assumption that this cannot occur without complete understanding of content and ability to integrate knowledge clinically	Skill and fact acquisition Predicated on the assumption that this can occur without a complete understanding of content or ability to integrate knowledge clinically
	Assessment practices	Formative assessment <ul style="list-style-type: none"> • Monitor student learning • Provide insight about learner process including critical thinking and decision-making • Emphasis on binary grading (pass/fail) 	Summative assessment <ul style="list-style-type: none"> • Evaluate student learning • Provide insight about student attainment of content knowledge • Emphasis on discrete numeric (0–100) or ranked letter (A, B, C, D, F) grades
	Assessment settings	Intentional Mirror clinical practice Example: Clinical knowledge assessments occur in authentic clinical experiences under direct observation.	Unrestricted Can occur anywhere Example: Clinical knowledge assessments occur during practical exams and skill-based demonstration of techniques.

for CBE outside of medicine. For the purpose of this manuscript, we propose a more concise explanation: CBE is an educational framework that is fundamentally flexible and outcome centric. Table 2 provides a comparison of the specifically flexible and outcome-centric elements of CBE.

Flexible

In a traditional educational framework, time serves as the primary determinant of student progression.^{3,32} Simply put, if a student matriculates into a 2-year education program, assuming the student has a smooth path towards completion (eg, no course failures or other interruptions), the student will successfully complete the program in 2 years. Since the 1910 publication of the Flexner Report, a critical review and

recommendation for medical education in the United States, time has been the primary determinant of a student's readiness to enter a profession.¹³ Using time as the driving force of the education model indicates that the path of learning is fixed; a learner progresses regardless of demonstration of content mastery. Furthermore, time as a driving force of student progression creates expectations around student abilities as well. For example, a student who has completed the first year of study (and the curriculum associated with that year) may be expected to apply that knowledge in clinical experiences simply because time has passed. Although the pace of degree completion in a traditional education framework is predetermined by course offerings and academic calendars, progression through a CBE framework is controlled by student capability.³ A student may complete the program of study in

more or less time based on the student's ability to demonstrate understanding. Thus, expectations about abilities in CBE are tethered only to student demonstration of that ability.

The timing of content delivery and assessment varies between traditional and competency-based approaches to education. In a traditional model, the instructor is at the center of timing decisions.³ Topics are instructed at predetermined points within an academic program, within a given semester, and even within a unit. Typically, assessments follow topic delivery. In a traditional educational framework, assessment timing is not based on whether students perceive they have complete comprehension of the topic nor whether they have been exposed to the content in a clinical situation. Timing in a CBE model places the student at the center of learning process and can be determined by any or all of the educational stakeholders, including the student, the instructor, the clinical supervisor, and even the patient.^{3,25} Content is instructed opportunistically, potentially dependent on when a patient with a certain health condition presents, a supervisor's expertise, or even a learner's curiosity. Assessment timing in a competency-based approach is then based on when a student identifies readiness to demonstrate understanding.^{32,33} The flexibility CBE affords in the timing of instruction and assessment also encourages faculty to embrace the framework that will flourish at their institutions, recognizing it may be different at another institution.

Outcome Centric

Competency-based education is outcome oriented, with the most common outcome being determination of whether a student is ready for independent practice.^{3,25,32} There is an assumption in a competency-based approach that a student is not ready to practice until there is both content understanding and the ability to integrate that content into clinical decision-making. The traditional education model emphasizes the acquisition of skills (eg, how to take a blood pressure reading) and facts (eg, normal blood pressure is 120/80).³ Although a successful student in this model may truly be ready to practice, the student may also possess the ability to perform a skill without completely understanding how the skill integrates into clinical decision-making (eg, what questions should be asked and what referrals should be considered if a patient is hypertensive).

Assessment practices also differ between traditional and CBE frameworks. Traditional evaluation aims to assess what a student has learned, informing the instructor if knowledge has been attained.³ Traditional grading structures are based on percentages (0%–100%) or letters (A, B+, C–, etc). Literature suggests these traditional assessment practices foster grade-centric behaviors, with students focused on achieving a grade rather than understanding content.³³ Competency-based assessment, on the other hand, is formative, aiming to monitor how a student is learning, thinking, and applying knowledge.^{3,33} Grading structures in a pure CBE model are pass/fail; a student either has or does not have an adequate understanding to practice clinically. Additionally, assessments in CBE occur in authentic experiences under direct observation.^{3,33} This is in contrast with traditional education, where assessments are typically performed in a classroom or teaching laboratory.

CONSIDERATIONS FOR CBE IN ATHLETIC TRAINING

A careful review of the health professions education literature finds few programs, in any discipline, that operate in a true competency-based model.^{34,35} Given this fact, it is not surprising that no pure competency-based programs exist in athletic training education.⁵ One key difference noted between the athletic training education literature and the literature available in other health professions education disciplines is the presence of the principles of a competency-based approach. Although language consistent with CBE can be found in literature about the education of other health care practitioners, including physicians,³⁶ nurses,^{37,38} pharmacists,³⁹ dietitians,⁴⁰ speech pathologists,⁴¹ physician assistants,⁴² and physical therapists,^{43,44} this language is not readily seen in athletic training education literature. Despite a dearth of published competency-based approaches in the education of athletic trainers (ATs), this approach is supported by educational theory⁴⁵ and warrants additional consideration in the profession.

Benefits of a Flexible Educational Approach

Health professions educators are charged with determining whether students are ready to work as independent clinicians. In a system of higher education driven by profit, pressures stemming from enrollment numbers, retention numbers, and graduation rates are realities from which athletic training educators are not immune. With the traditional education model grounded in time, educators may be forced to decide between retaining students who may not have a complete grasp of curriculum and justifying to administrators a decline in midprogram enrollment. A student progressing through athletic training curricula without mastery of the concepts is at risk to graduate without being prepared to pass the Board of Certification (BOC) exam, or, perhaps worse, to pass the BOC exam without being prepared to provide high-quality health care. A flexible approach in a CBE model allows students who may not yet be able to demonstrate thorough understanding an opportunity to slow their progression in a program. This flexibility would also allow students to advance more rapidly if they are able to demonstrate content mastery earlier than others.

Timing of instruction and assessment in athletic training education would also benefit from a flexible approach. Athletic training education programs typically do not wait until all educational content has been delivered to begin clinical experiences, meaning that students are expected to be learning across a continuum that spans from curricular content in the classroom to application during clinical experiences. A flexible approach allows optimization of these clinical experiences. For example, when students are completing a clinical experience in which they are exposed to patients who wear protective equipment (eg, football helmets, protective face shields, lacrosse shoulder pads, law enforcement duty belt), they would learn, apply concepts, and demonstrate mastery of associated content, like care of equipment-laden spine-injured athlete. Likewise, students who are assigned to complete an upcoming clinical experience at a high school could prepare by completing a foundational pediatric unit. Providing educational content based on students' clinical experience rotations rather than a time-fixed progression may allow better real-time application of content to clinical

practice and therefore foster stronger translation of knowledge, skills, and abilities.

Benefits of an Outcome-Centric Educational Approach

One cornerstone of CBE is a de-emphasis on grading to encourage student focus on learning outcomes rather than grade outcomes.^{25,33} A system that de-emphasizes grades allows learners to set goals focused on mastery rather than performance.^{46,47} In athletic training, a mastery goal (eg, to improve incorporation of patient values into clinical decision-making) is quite different than a performance goal (eg, to improve ability to take a history) or an avoidance goal (eg, don't forget to ask that question again).^{46,47} While not forgetting an important question and taking a complete history are important skills for an aspiring AT, neither is useful without the ability to incorporate what is learned during a history into the remainder of patient evaluation and management. The CBE framework puts the emphasis on this end goal of patient management rather than on each individual skill necessary to get there. The importance of assessing students' ability to integrate skills and facts into clinical practice is one of the reasons athletic training abandoned the practical exam component of the BOC exam, according to a former BOC president (S. Brown, MS, oral communication, March 2019). Although this former component of the exam tested skills, it was not suited to assess how the skills integrated into patient care decisions (S. Brown, MS, oral communication, March 2019).

An athletic training educational model that prioritizes preparedness to practice over skill acquisition forces a closer examination of grading practices. Traditional summative grading practices report that a student who earns 100% is perfect, a learner who scores 75% understands only three-fourths of the material, and an aspiring clinician with a score of 80% is exactly 2% less prepared than a student who scores 82%. However, the translation of complex clinical decisions into concrete statements about abilities seems particularly unhelpful for health care professionals. With a need to distinguish capable future clinicians from those who are not yet capable, a traditional approach to grading does not seem necessary.

A true competency-based approach to grading would categorize learners in 1 of 2 ways: competent/not competent or pass/fail. Although there is not any literature on pass/fail grading in athletic training education, this binary approach is prevalent in medical education. Medical education in the United States seems to have settled on traditional grading for clerkships and pass/fail grading for preclinical courses and experiences.⁴⁸ In the fall of 2016, 19 of 20 *US World and News Report* top medical schools used a pass/fail grading system for all preclinical components of the program.⁴⁹ There are 2 hypothesized causes for the decline of traditional grading systems in medical education: grades are not a predictor of professional success, and gradeless systems promote student wellness.⁴⁹ Medical students graded in a pass/fail system report lower levels of stress,^{50,51} greater amounts of cohesion with their classmates,⁵⁰ and greater satisfaction with their education and personal lives.⁵² Students graded in systems with 3 or more categories (eg, A, B, C, D, F or honors, pass, fail) demonstrate higher levels of emotional exhaustion and depersonalization and are more likely to experience burnout

compared with those in pass/fail grading systems.⁵¹ Meanwhile, grading systems do not have an impact on medical student performance in courses, clerkships, medical licensing exams, residency placement, or class attendance.^{51,52} Although there are clear differences between medicine and athletic training, these potential benefits of a competency-based approach to grading are worth considering.

The outcome-centric approach in CBE changes the setting of assessments from classrooms to clinics. Athletic training students consistently identify clinical experiences as one of the most valuable learning opportunities of professional education.^{53–57} Further, both students and faculty believe that diverse clinical experiences and mentorship from practicing clinicians contribute to newly credentialed ATs feeling prepared to practice independently.^{58,59} Given the perception from both educators and students of the learning potential in clinical education, it seems prudent to conduct the majority of, if not all, assessments in a clinical setting, with a real patient and the opportunity for expedient feedback. Although nearly 90% of 201 athletic training programs reported assessing student capabilities on real patients in clinical practice, it has been reported that 70% performed fewer than half of their assessments in this manner.⁶⁰ A large perceived barrier to assessing students in real time is that the occurrence of opportunities clinically does not always coincide with content delivery in the classroom. Of 201 programs studied, 75%

agreed that a barrier to real-time clinical proficiency evaluation was that the actual occurrence of an injury or condition does not conveniently coincide with the evaluation timetable established for a particular clinical proficiency.^{60(p391)}

Thus, CBE presents a strategy that encourages assessment opportunistically and eliminates some of the need for firm timetables.

Barriers to CBE

Although there are examples of CBE in practice proving implementation of this framework is feasible, barriers certainly exist. Time and resources are the most commonly cited^{34,35} and, for educators, are the same barriers as those to most new educational initiatives. Although it may not be possible to identify more time or resources, those attempting to implement CBE programs cannot let these barriers serve as the ultimate deterrent. With necessary stakeholder buy-in, creative solutions exist to structuring faculty load.^{34,35}

Other barriers to implementing a CBE structure include those that restrain higher education to a graded, credited semester system. These regulations may present challenges for student loans, transcripts, textbooks, and online learning platforms, among other things. Fortunately, many educators who have successfully implemented competency-based practices into the education of health care professionals have shared their experiences.^{34,35,61–64} Although the reality that barriers to CBE exist cannot be ignored, many of the challenges and, more importantly, the solutions may be institutionally specific. Thus, educators seeking to incorporate a CBE framework may benefit from seeking out peer institutions that may have identified strategies to address common difficulties.

CONCLUSIONS

Given the profession's current landscape, particularly with the impending implementation of the *2020 Curricular Content Standards*,²⁸ it seems much about athletic training educational programs is already changing. With the burden of certifying entry-level practitioners as "ready to practice" falling to athletic training educators in the professional programs, a CBE model seems well suited to develop clinicians who are able to integrate knowledge and skills that span domains of practice. Additionally, in CBE, the clinical setting becomes an intentional, structured environment for context-specific learning, skill development, and assessment. As athletic training continues to seek its place in the broader health care system, it seems that CBE warrants consideration in athletic training. A change to a pure CBE approach would represent a global paradigm shift that has left other health care education fields, such as medicine, consistently reporting the benefits of CBE without the ability to implement the practices on a wide scale.^{3,19} Athletic trainers are a unique class of resilient, hardworking problem solvers. With the adoption of the *2020 Curricular Content Standards*, athletic training educators have the opportunity to reject the status quo and embrace an opportunity to reshape the education of future health care professionals.

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