Four-Corner Model for Curricular Development in Athletic Training Education

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Objective: To present a model for an educational continuum that identifies entry-level to advance practice competencies and content for athletic training education.

Background: Specific degree-level purposes within the context of higher education, in conjunction with professional needs should be addressed in athletic training education. Post-certification (graduate) programs in athletic training should offer increased depth of knowledge and prepare students as clinical experts, scholars, and leaders. To this end, curricular content, based on the athletic training job analysis (i.e., Role Delineation Study), institutional missions, and degree-level specific purposes need to be considered.

Description: Graduate athletic training education programs are primarily left to the purview of individual institutions.

Using existing curricular development models (i.e., DACUM model and participatory approach) and predictive methods (i.e., Delphi Technique) within the context of higher education, athletic training educators can identify specific competencies and associated content. Then educators can determine the levels of importance of those competencies and content according to the types of athletic training education.

Clinical advantages: The proposed framework does not violate institutional and faculty autonomy, but helps to delineate important content for development in graduate athletic training education.

Key Words: Competency, Content, Novice, Expert, Delphi Technique.

Entry-level athletic training education has undergone dramatic changes in recent history. Post-certification education is emerging as a priority. Recently there have been significant developments in post-certification athletic training education, including the renaming of the Graduate Education Committee to the Post-Professional Education Committee (PPEC), which indicates a significant philosophical change.[1] Developing a curriculum-based, educational continuum that depicts both the entry-level competencies as well as advanced-practice competencies (post-certification) for athletic trainers is becoming a topic educators must now discuss. Despite a 30-year history of post-certification education, its role in the preparation of athletic trainers is less established than entry-level preparation.

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There are inherent differences in both intended outcomes and accreditation standards between entry-level and post-certification education. For example, the intended outcomes are entry-level clinicians versus advanced-practice clinicians respectively. Using a specific example, entry-level education includes "knowledge of leadership styles,"[2] (presumably to understand leadership dynamics in the work place). On the other hand, post-certification education requires "preparation for leadership roles"[3] (presumably to be leaders in the work place). Given the different expectations between the types of athletic training education, determining how to best assign content and curriculum between the types of athletic training education requires dialogue. Throughout this documents, leadership is used as "a case" because it is desirable for all athletic trainers, yet there is a clear distinction between entry-level and post-certification expectations identified in the literature.[2-4] It is presumed however, that the reader understands the Four-Corner Model is applicable to any curricular construct that transcends the types of athletic training education.

While entry-level athletic training education programs have a prescribed competency matrix for clinical behaviors, other than the conceptual ideal of increasing depth of entry-level competency, there are no additional competencies established or recommended for post-certification athletic training education. This is intentional since graduate athletic training education programs should be based

on the missions, goals, and faculty expertise of individual institutions.[3] However, within certain constructs (e.g. leadership) not having a curricular framework makes satisfying the Graduate Review Committee's (GRC) requirement of preparing athletic trainers for leadership roles very ambiguous.

With the advent of the entry-level master's degree, there is a contradiction between the outcomes of entry-level athletic training education and outcomes associated with graduate education in general. From a professional perspective, the graduate is entry-level, but from a degree perspective (and the perspective of much of the public and many non-athletic training employers) the graduate has advanced standing. This dichotomy can lead to ambiguity on how to prepare entry-level master's students. An example is that graduates of entry-level master's programs despite being entry-level clinicians might be expected to demonstrate advance leadership or scholarship due to their graduate level academic work (via an internship, project, or thesis). Therefore, the purpose of this article is to present a competency-based, curriculum development model that can be utilized in athletic training education and that takes into account each of the types of Athletic Training Education Programs (ATEPs).

The four-corner curricular framework proposed for identifying competencies and content in athletic training is based on four theoretical foundations: (1) Context of Higher Education, (2) Developing a Curriculum (DACUM) and participatory models of curriculum development, (3) Competency-Based Education: Novice to Expert Continuum, and (4) Future Predictive Methods: Delphi Technique. The four elements of the Four-Corner Model may be applied to any content or competency area in athletic training (Figure 1). The four theoretical aspects integrate to delineate a curricular construct that is viable across the entire continuum of athletic training education, from entry-level baccalaureate, to entry-level master's, to post-certification master's, and on to expert level.

Context of Higher Education

Higher education is typically defined as the education provided by institutions that award academic degrees.[5] "Colleges and universities are typically organized around clusters of like disciplines."[6] "Disciplines have conscious goals, which are often synonymous with the goals of the departments and schools."[6] It is in the context of the individual institution, its mission, values, and goals that curriculum for specific disciplines are developed and approved. Figure 2 is a chain-of-events schematic showing the sequential progression (thick arrows) and lesser influences (thin arrows) in education on a discipline's curriculum.

All degree levels serve two purposes, the program's (discipline's) purpose, as well as the purpose of the degree level. Within higher education, a program's (or discipline's) purpose is to prepare competent practitioners for that discipline. The degree level also serves a distinct purpose. Baccalaureate programs offer professional education by requiring specialized course work (i.e., entry-level) in a specific discipline or field of study.[7] In addition to this professional education, there are the added requirements of
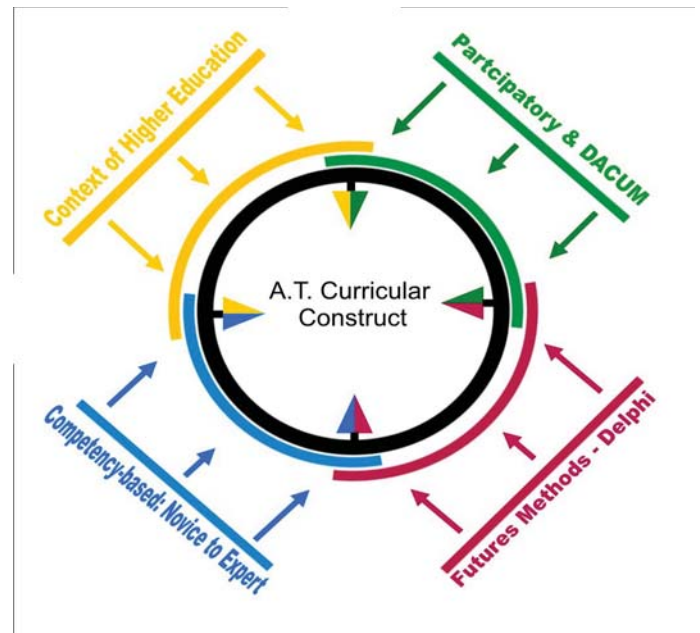

Figure 1. Chain-of-events schematic showing the sequential progression (thick arrows) and lesser influences (thin arrows) in higher education on a discipline's curriculum.

the bachelor's degree itself (the same is true for all degree types). For example, at the baccalaureate level, the emphasis is on a multi-disciplinary approach, which includes general education in arts, sciences, and humanities in conjunction with specific education in a discipline or profession and preparation for advanced study in that discipline.[7,8]

Master's level education is more systematic than the baccalaureate level and represents a significant achievement (mastery) above the attainment of a baccalaureate degree.[3,9,10] Because of this fact the athletic training entry-level masters' programs offer unique challenges. While they are entry-level in clinical competency preparation, they are, in fact, graduate programs. The purpose of the athletic training profession is served by preparing entry-level practitioners. However, this may be at odds with the purpose of the master's degree, which is advanced preparation. Given the rigorous clinical requirements and time constraints of entry-level master's programs, it is debatable if entry-level master's programs can adequately prepare students for advanced scholarship at the doctoral level without additional post-master's requirements.

Doctoral level education is intended to be higher than, and distinct from, master's level education. At the doctoral level, the requirements of the profession and the degree-level are less problematic; both understand that the primary role is to produce a profession's scholars (although introducing professional or clinical-doctorates raises other questions of the role of the "doctorate"). The Carnegie Foundation[11] states the doctorate is "to educate and prepare those to whom we can entrust the vigor, quality, and integrity of the field." The doctorally-educated professional is "a scholar first and foremost, in the fullest sense of the term."[11] The
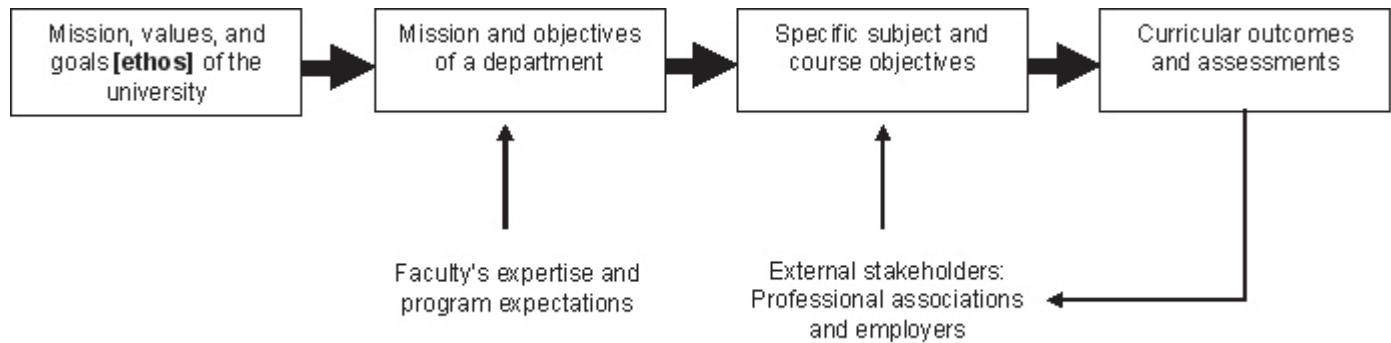
Figure 2. Chain-of-events schematic showing the sequential progression (thick arrows) and lesser influences (thin arrows) in higher education on a discipline's curriculum.

doctorally educated individual is a "leader" who has "developed the habits of mind and ability to do three things well: 1) creatively generate new knowledge, 2) critically conserve valuable and useful ideas, and 3) responsibly transform those understandings through writing, teaching, and application."[11] Typically, a discipline's professionals advance from entry-level, to advanced-mastery, to expert in conjunction with their promotion though higher education, while meeting the needs of the profession and satisfying the purpose of the individual degree-levels. Figure 3 depicts degree-level goals in the context of higher education in conjunction with increasing professional knowledge and depth.

DACUM and Participatory Approach

The term "curriculum" is typically known as the "course of study offered by an educational institution."[12] The Latin root of the word curriculum means "to run" as "to run a race course."[12] Therefore, a curriculum is all the activities (didactic and clinical) a student participates in over a prescribed course of time in order to successfully complete a prescribed course of study.[12] The mission, goals, objectives, and curriculum of any academic program are "influenced by external and internal demands."[12] External demands relate to the needs of the industry and other stakeholders (practicing professionals, employers, community, and the discipline).[12] Internal demands are those placed by the educational community, such as the university's ethos, teaching, learning, and research.[12]

Two primary theories of curriculum development are used for this framework. The first is the Developing a Curriculum (DACUM) method. DACUM is a method that is applied to curriculum formation for rapidly changing industries having high external demands placed on them.[13,14] The premise of DACUM is to establish research-based content for a new or rapidly evolving program of study.[14] DACUM uses content experts who are most familiar with a specific discipline or program of study to determine the evolving curriculum needs of the program.[13] DACUM primarily utilizes the knowledge and expertise of external stakeholders, such as practitioner experts to develop, modify, or make recommendations for curriculum. "DACUM has multiple uses. The DACUM process is used for job analysis, occupational analysis, process analysis, functional analysis, and conceptual analysis."[15]

The second curriculum theory is the "participatory approach." The participatory approach to curriculum development has also been called the "interactive" approach.[12] "Curriculum should change and develop as a program itself is implemented."[16] "Participatory curriculum development calls for radical changes to the hierarchical curriculum development approach."[16] The primary emphasis of this

Figure 3: Degree-level goals within the context of higher education.

approach is the use of various interested groups or educational stakeholders" in the process of curriculum development.[12]

The participatory approach is similar to DACUM in that it uses "outside curriculum development experts," but differs in that it includes several stakeholders who may not be content experts.[12] The participatory approach requires the participation of multiple stakeholder groups in an attempt to draw their input into the curriculum.[12] Both the DACUM and participatory approach to curriculum development are used effectively in emerging disciplines having exposure to diverse settings. Currently entry-level and post-certification athletic training education are evolving and undergoing change.[1,17-19] Athletic training practitioners are integrated into multiple work and clinical settings.[2,20] Therefore, a combination or modification of the DACUM and participatory approaches to curriculum development is ideal to identify emerging and relevant themes in athletic training professional education.

Competency-Based Education

"The greatest challenge facing any professional-education program is to produce professionals who are capable of independent and critical thinking, who can sequentially analyze and solve dynamic problems… who rapidly understand problems…, and who can work as part of a team."[18] Competency refers to what people can do rather than what they know.[21] This implies that competency is an outcome with clearly defined standards, and is a measure of what an individual can actually demonstrate.[21] "Competencies are the result of integrative learning experiences in which skills, abilities, and knowledge interact to form bundles that have currency in relation to the task/s for which they are assembled."[22] In other words competency is an integrated collection of knowledge, skills, and abilities (KSA). For example, "effectively communicates" is a competency that includes skills in reading, writing, speaking, and use of body language. Competencies consist of knowledge, skills, and abilities that are both context specific and context free.[21] Therefore, certain competencies in athletic training education may only be valuable in the athletic training context (or even more specifically in one type of athletic training role or setting), and other competencies may be important in multiple contexts.

Within competency-based education, progressive evaluation (i.e., learning over time) is critical to successful implementation. Competency-based education is important because it assists learners, as well as outside stakeholders, in understanding the specific skills and knowledge that should result from learning experiences.[22] Another rationale for implementing a competency-based curriculum is that "specific competencies provide directions for designing learning experiences and assignments that will help students gain practice in using and applying these competencies in different contexts."[22]

Novice and Expert Professional Competency Standards

Athletic training, physical therapy, and nursing education are all examples of competency-based designs.[17] Competency-based education is a primary model for professions with clinical education requirements.[17] Furthermore, competency-based clinical education is vital in the transformation from novice to competent practitioner."[17] Within professional competencies, there are continua from novice to expert that can range between three and six (or more) stages. Medical education (Dreyfus model) consists of five stages: (1) the novice stage, (2) advanced-beginner stage, (3) competent stage, (4) proficient stage, and (5) expert stage.[23] Benner[24] also identifies the same five stages of novice to expert in clinical practice of nurses.

After completion of an entry-level education program and successful passing of the Board of Certification, Inc.'s (BOC) examination, for the first year of clinical practice the newly certified athletic trainer has been called a novice.[25] The term novice is used by the Joint Review Committee for Athletic Training Education (JRC-AT) (the JRC-AT is now the Commission on Accreditation of Athletic Training Education, CAATE) to describe athletic trainers with less than one year of experience (regardless of degree level).[23] However, it should be noted that the JRC-AT description of a novice is in relation to an inexperienced athletic trainer becoming a clinical instructor or supervisor and does not necessarily mean the same athletic trainer is a novice practitioner. This point serves to validate the common understanding that a "novice" in general is typically a new practitioner. Benner,[24] in defining a novice, says that the novice applies procedures universally and makes decisions independent of specific cases. The novice allows little to no room for anything but objective facts and uses little situational specific judgment. Theoretically, the novice practitioner tends to rely on being told what to do and how to do it, because of the lack of clinical experience and unfamiliarity with assimilating multiple sources of input quickly.[24] Years of experience might be less of an indicator of novice status than is the ability to quickly learn and apply new information. It is possible that a senior athletic training student is less of a novice than a certified athletic trainer based solely on the issue of ability to critically analyze and assimilate new information into practice. None-the-less, post-baccalaureate clinical experiences, under the direction or supervision of an advanced-practice or master clinician, may help to advance the novice practitioner to that of a more competent practitioner, and may be a necessary pre-requisite for entry into post-certification ATEPs. Clinical competency, as defined by Benner,[24] is often seen in practitioners with two or three years of similar experiences who are now consciously aware of long-range goals and plans, which are based upon conscious, abstract, and analytical contemplation of the problem. Clinical competence, as described by Benner,[24] is an advanced ability and is not to be confused with entry-level competency often referred to in entry-level athletic training education.

Advanced clinical practice requires a rigorous and significant investment of time.[1] The National Athletic Trainers' Association (NATA)[26] states that a master clinician requires additional knowledge, skills, and experience beyond entry-level competencies and clinical proficiencies." Ideally, post-certification athletic

training education and related clinical experiences advance a competent professional to the status of master clinician (or advanced-practitioner). Furthermore, athletic trainers with post-certification education should be able to solve complex problems, integrate the best evidence into clinical decisions, contribute to the literature via scholarship, and measure and disseminate clinical outcomes.[1] Ultimately, the intended outcomes of post-certification preparation for the athletic trainer can be compared to Benner's[24] description of proficiency. Proficiency is a more advanced stage of professional development than competency.[22] It is the proficient practitioner who begins to see the bigger picture in the correct context and knows when and how to modify or alter plans in response to changes in a situation or an unexpected outcome.[24]

Expertise is the final stage in the novice-expert continuum.[24] Expertise is evidenced via an experienced practitioner who no longer need rely on analytical tools (such as rules, guidelines, or maxims) but has an intuitive grasp of diverse circumstances.[24] Experts use a high degree of "intuition" based on rapid (almost instant) assimilation of valuable experiences.[24] Furthermore, an expert's experience has less to do with the passage of time, and relies more upon the ability to extract wisdom from an experience, which requires advanced critical thinking, contextual intelligence, reasoning, and organizational savvy.

Future Predictive Methods: Delphi Technique

Futures research is essential in the formation of perceptions about an industry.[27] The Delphi Technique has specific implications in the development of curriculum (content) and professional competencies. One of the "core tools" in futures research is the Delphi Technique, which is the "most prominent of the consensus methodologies."[27] The Delphi Technique is used to "elicit" and "refine" the opinion of a panel of experts.[27] The subjective opinion of experts "is considered to be more reliable than individual statements and more objective in its outcomes."[27] It is common to find the Delphi Technique used in "education and academia."[27] Procedurally, the Delphi Technique has multiple applications and multiple adaptations.[27] Primarily, the Delphi Technique follows an outline where, initially, questions or subject matter are circulated to expert panelists to elicit comments and opinions on the issue or subject at hand. Those responses are then organized (by a researcher) and redistributed to panelists in a questionnaire format.[27] Finally, the questionnaires are redistributed, each time with updates and "reformulations" from the previous questionnaire, giving the respondents an opportunity to justify their response if radically different from other responses. This final phase is repeated until "consensus or stability is reached."[27]

The Delphi Technique has been used repeatedly as a method in determining professional competencies in curriculum development for professional education.[28-30] Bowles[31] reports that, between 1984 and 1999, the Delphi Technique was used in allied health literature 300 times. The Delphi Technique is valuable in the role of "planning educational courses" and in determining "curriculum content," specifically in healthcare and medical professions.[32] Although no specific reference to this is made in the BOC's Role Delineation Study (RDS), there are similarities in the RDS methods to the methods used for the Delphi Technique.

It is a profession's job analysis (e.g., BOC's RDS), that delineate a profession's competencies. The job analysis also serves to establish content validity of any exam whereby credentials are granted. Furthermore, a job analysis serves to help validate that what is taught in educational programs actually represents the skills needed for clinical practice. The Four-Corner Model can be applied as a link between the job analysis and curriculum development efforts in higher education.

Application of the Four-Corner Model for Content and Competencies

Using existing degree levels and types, a typology of professional education in athletic training has been constructed: entry-level baccalaureate, entry-level masters', post-certification masters', and athletic training doctoral programs. Figure 4 shows the different types of education in athletic training and possible progression(s) through the three levels of higher education. The solid, thicker lines represent athletic training education and the recommended progression through the three levels of higher education. The dashed-lines indicate possible, but not recommended, options. This educational typology represents four different sets of educational expectations and professional achievement, based on the level (undergraduate or graduate) and/or
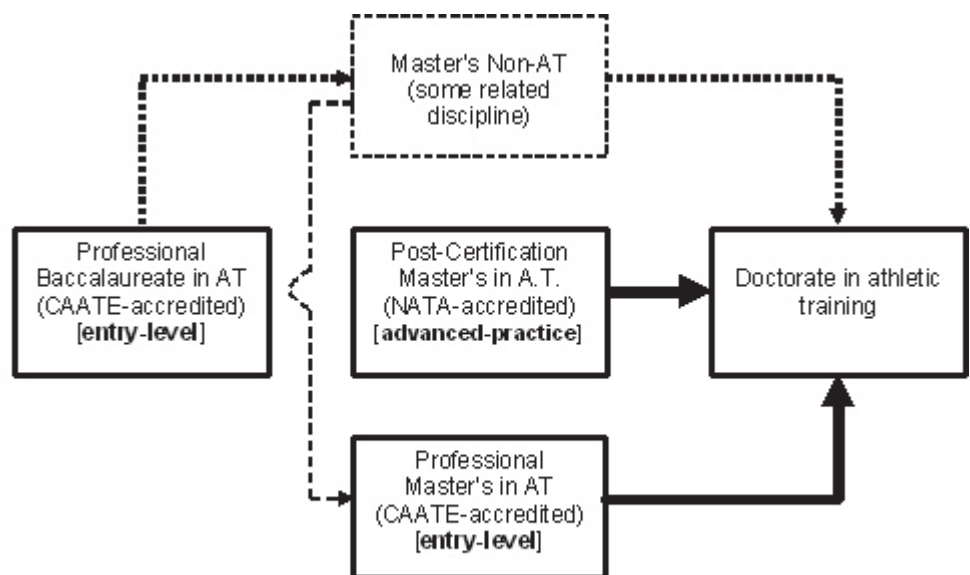
Figure 4. Types and progression of education for athletic trainers.

the degree name (baccalaureate, master's, or doctorate). Furthermore, in addition to this typology, four additional themes guided the formation of this framework: (1) the context of higher education, (2) DACUM and participatory models, (3) competency-based education, and (4) the futures predictive methods: Delphi Technique. The curriculum framework involves establishing levels of importance, based on increasing depth of knowledge, for identified competencies according to each type of athletic training education program for any curriculum construct of interest (see Figure 1).

The Four-Corner Model has been applied to leadership competencies and content in athletic training.[4] A Delphi Technique using content experts (faculty) and expert practitioners, followed by an evaluation from a national sample (i.e., DACUM and participatory models), evaluated several leadership competencies from an extensive literature review that included the athletic training job analysis (BOC's RDS) and Athletic Training Educational Competencies. This resulted in the identification of several leadership competencies and content areas important for athletic training.[4] These leadership competencies and content areas were rated regardless of context or role and, therefore, spanned the continuum from novice to expert. As expected, in later rounds, these same competencies and content differed in importance according to the type of education and level of practice (i.e., context of higher education).[4] Applying the Four-Corner Model closely mimics the procedures used for the athletic training job analysis (i.e., BOC's RDS), which is valuable for delineating content and competencies and helps establish content validity of curricular constructs. Furthermore, the Four-Corner Model allows for flexibility among institutions, based on their unique ethos. The implications of the Four-Corner Model extends beyond leadership and can be used to delineate content of existing athletic training competencies for any athletic training curriculum construct.

As athletic training education continues to evolve, it is necessary to delineate similarities and differences regarding competencies and/or content between entry-level and post-certification athletic training education. Explicit in the progression from novice, to advanced-practitioner and mastery, to scholar and expert are the preparation requirements specific to the four types of athletic training education. Adapting and integrating curriculum development models (i.e., Delphi Technique, DACUM, and participatory approach) within the overall context of higher education can help assign appropriate competencies and content for all levels of athletic training education across the novice to expert continuum.

Summary and Discussion

The purpose of this article was to describe a curriculum development model that could be used across the entire continuum of athletic training education and that takes into account perceived differences between the four types of athletic training education. Implementing this framework implies that competencies identified for athletic training remain constant through the levels types of

athletic training practice and education. While competencies may remain the same, the perceived importance of individual competencies may change as individual's progress from entry-level, to post-certification, to doctoral athletic training education. Applying the Four-Corner Model can help to identify the competencies, constructs, or skills that might be important for different skill or education levels.

Unfortunately, perception of advanced-practice ability does not always coincide with type of education attained (i.e., post-certification masters). Mistakenly, years of experience is often revered as the sole basis for novice or expert status. The Four-Corner Model could inform the discipline of what KSAs are generally regarded as the "most" important for novice clinicians and which are "most" important for expert clinicians. Having this information could then serve to improve continuing education requirements and programming.

The Four-Corner Model can be adapted to delineate importance ratings of existing competencies within any of the twelve content areas identified for athletic training education.[26] The outcome could be specific importance rankings of competencies for each type of ATEP. For example, the content area "health care administration" identifies 22 cognitive competencies; competency #14 involves strategic planning.[26] It is reasonable to assume that strategic planning might rank higher in importance for inclusion in post-certification education than entry-level education. Essentially, strategic planning may rank #1 (i.e., the most important) for one type of ATEP and #22 (i.e., the least important) for another type of ATEP. While strategic planning is important, its level of importance varies amongst the different types of ATEP. This information could inform educators, administrators, and other stakeholders in curricular and content decisions that are level appropriate. From a clinical perspective, this model can also help to determine the special tests that are more important to teach in entry-level programs and the ones that should be taught in post-certification programs. Finally, it could help to delineate the behaviors or traits from larger constructs (i.e., mentoring or leading) that are perceived to be the most important for an athletic trainer to possess.

Ultimately, implementing the Four-Corner Model facilitates athletic training education's service to the profession by preparing athletic trainers with the expected level-appropriate KSAs. Figure 5 is a representation of how the Four-Corner Model can be expected to delineate role preparation and how it may be expected to progress as the education of the athletic trainer advances. The dotted line represents a recommended option that is unlikely to occur.

An additional implication of the Four-Corner Model is that it can inform the evolution of the "dichotomous" entry-level masters' programs. Given the nature of being an entry-level "graduate" degree, it is likely certain abilities, whether a distinctive aspect of the professional education or not (i.e., leadership, critical thinking, or scholarship), are expected to be greater in these graduates
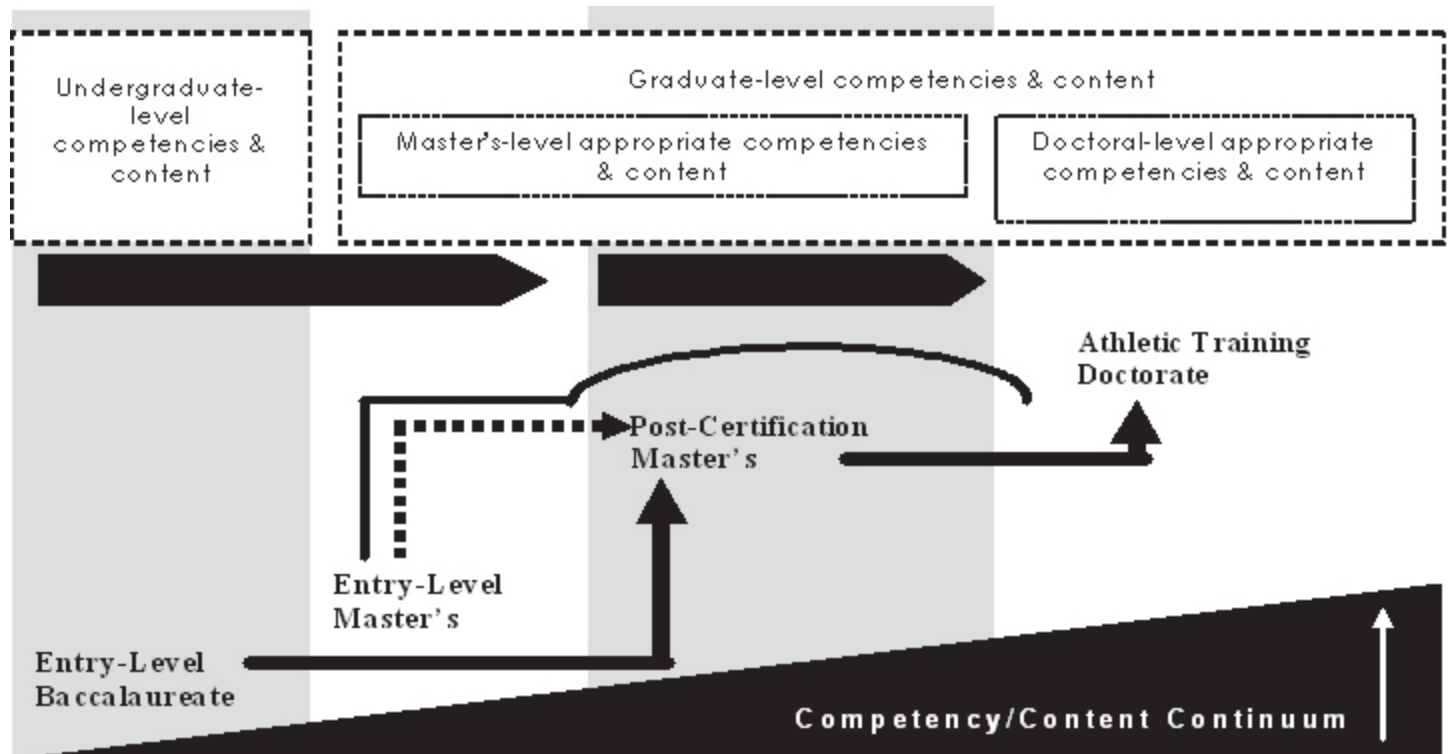
Figure 5. Schematic of leadership competency progression and placement of leadership content into the four different types of athletic training education.

compared to their undergraduate counterparts. The Four-Corner Model could help to identify if different perceptions exist between either type of entry-level ATEP. If different expectations do in fact exist between different types of entry-level ATEP, directors of entry-level masters programs can mold their curriculum to satisfy those differences without having different standards of accreditation.

Conclusion

With the growing need for advanced-practice clinicians, the corresponding need for relevant post-certification athletic training education, and the need for scholar-experts to expand athletic training knowledge, integrating a curriculum model that emphasizes the unique professional and degree-specific aspects of each type of ATEP is critical. Having a model that informs continuing education helps the ongoing effort to prepare better professionals. However, the greatest implication of the Four-Corner Model is how it serves athletic training education by providing a method for determining and delineating the competencies and related content that are most important to the four specific types of ATEP.

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