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ORIGINAL RESEARCH REPORTS

Developing a Competency-based Outcomes Framework for Doctor of Physical Therapy Education

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Abstract

Purpose: **Physical therapist education programs rely on outcomes to evaluate a student's competence in performing skills essential to the physical therapy profession. However, current outcomes, such as, graduation, employment, and licensure pass rates fail to assess comprehensive competence in the professional abilities of a physical therapist and offer variability in the expectations of competence in professional practice. Competency-based education (CBE) offers a learner-centered and evidence-based process to assess performance on consensus-driven outcomes over a period of time. While other medical professions have adopted this process it is new to physical therapist education programs. The purpose of this manuscript is to describe the process and outcomes of developing a competency-based outcomes framework for an institution's Doctor of Physical Therapy (DPT) program.**

Method: **A task force was assembled with the objectives of developing domains of competence, competencies, and milestones that were informed by competency-based literature across health professions and the DPT program's and APTA's core, guiding documents. Domains and competencies were, then, validated using an expert panel and survey process. Individual milestones were mapped to curricular assessments.**

Results: **A framework composed of 8 domains of competence, 66 competencies, and 198 milestones was developed. The mapping process identified that all competencies linked with course assessments.**

Discussion: **This competency-based outcomes framework provides a comprehensive list of validated domains and competencies reflective of entry-level physical therapist practice for a New England region DPT program. Additionally, milestones that were associated with competencies, developmental in nature, and reflective of entry-level physical therapist behaviors were developed. Next steps toward implementation are discussed.**

Keywords: Competency-based education, Domains, Competencies, Milestones, entrustable professional activities

1. Introduction

Competency-based education (CBE) can be defined as a model of education through which "individuals are assessed on an evidence-based, consensus-driven set of learner performance outcomes over time, and progress along the learner continuum when competence is demonstrated" [1]. (p27) The rationale for CBE as outlined by several authors [2–4] includes its focus on the outcomes of the educational process, rather than on the process or the content of a curriculum. The outcomes reflect the needs and expectations of society for their healthcare, rather than the unique characteristics of individual educational programs. Furthermore, CBE places a strong emphasis on learners' actual performance of activities that require integration of knowledge and skills in a workplace setting. Assessments of performance are determined by expert judgment and have explicit criteria for determining learners' ability level. These attributes help to reduce unwanted variability in practice and ensure

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that graduates have the ability to meet the needs of those they serve.

1.1. Rationale for framework development

CBE starts with defining the essential health needs of the community and focusing learning and assessment of learners' performance through that lens [2]. Defining the health needs of the community allows learners' outcomes to be mapped to desired changes in community health and CBE emphasizes learners' outcomes rather than the processes to attain them [2]. Most current methods of assessing outcomes for physical therapist students are not competency-based and, therefore, may not sufficiently assess a student's competence in skills essential to the physical therapy profession. Developing and implementing CBE in academic programs, however, requires significant changes [4]. Current outcomes used by the Commission on Accreditation in Physical Therapy Education (CAPTE) to assess physical therapist education programs include graduation rates, employment rates, and licensure exam pass rates. [5] Yet, none of these outcomes assesses the actual abilities of new graduates to demonstrate competence as a health professional. Furthermore, CAPTE requires that each individual educational program identify the expected outcomes for its own graduates, leading to inconsistency across the profession [5]. Individual programs determine how they will ensure that students graduate with entry-level skills, and many programs cite metrics of performance in the setting of clinical education, such as the Clinical Performance Instrument (CPI), or graduates' perceptions of their abilities [6]. These measures are open to widely varying interpretations and offer no standardization for scoring cut points (CPI) or standardization of measurement (graduate surveys), requiring that individual programs establish their own standards for expected student performance. Each of these factors contributes to a substantial risk that new graduates of an entry-level physical therapist program will lack the necessary abilities for competent practice. CBE offers a potential solution to these shortcomings.

Frank et al. [4] cite four overarching themes in CBE that have an impact on program curricula. The themes include: (1) assurance that graduates demonstrate competency in all domains of practice with an explicit definition of each domain; (2) emphasis on competence as an organizing framework that serves to integrate the curriculum; (3) flexible curricular schedules that can accommodate the needs of individual learners; and, closely related to number 3, (4) emphasis on learner-centeredness, encouraging learners' accountability for their own development. In consideration of these themes, Gruppen et al. [2,7], identified the central step in CBE as determining the essential domains of competence for program graduates entering the workforce. Domains of competence are "broad, distinguishable areas of competence that in the aggregate constitute a general descriptive framework for a profession" [8]. The process of identifying relevant domains of competence begins with determining the core abilities that all graduates must ultimately have for successful professional entry, i.e., entry-level practice. Identification of relevant domains of competence may be based on needs assessments, practice profiles, or national health priorities [2].

Comprising each domain of competence are the specific competencies and milestones. Competencies are defined as the "observable abilities of a health professional, integrating multiple components such as knowledge, skills, values, and attitudes" [8]. Competencies are grouped into domains of competence that are mapped to the health needs and expectations of society. Competencies may also express the priorities of the institution and the profession [2,7]. Milestones are points in development that describe key elements of the competency along a developmental continuum, for example from novice, to advanced beginner, to competent [9]. The milestones describe learners' performance related to particular competencies and allow learners and their instructors or mentors to understand where there is room for growth. Because of the focus on performance, the need for remediation can be easily recognized, particularly if a learner is challenged by multiple competencies within a domain.

In 1979, May [10] outlined the basic elements of CBE for entry-level physical therapists. However, only recently has there been momentum toward developing the structures necessary to facilitate a transition to CBE [3,11–14]. In 2021, the Educational Leadership Partnership with members from the American Physical Therapy Association (APTA), the American Council of Academic Physical Therapy (ACAPT), and the APTA Academy of Education (APTA-AOE), among others, produced a report of their work developing a vision for excellence in physical therapy education [1]. They identified CBE as part of the pathway toward meeting that vision.

One important step along the pathway, that has been accomplished, is the adoption of a common language related to CBE (Table 1) [3,15,16]. Ongoing work has involved large groups of stakeholders working together to define the relevant domains of

Table 1. Glossary of terms [3].

Word	Definition
Competency-based education	An outcomes-based approach organized around competencies derived from an analysis of societal and patient needs. It de-emphasizes time-based education and promises greater accountability, flexibility, and learner centeredness [15]. CBE is a concept, a philosophy, and an approach to educational design where learner professional progression only occurs when competency is demonstrated [16].
Competency	Characteristics or features of a person, the ability to do something successfully or efficiently, an observable ability of a health professional.
Domains of competence	A grouping of competencies based on a similar theme. These broad, distinguishable areas of competence, in aggregate, capture the essence of a profession. There are 6 domains of competence described by ACGME: patient care, medical knowledge, professionalism, interpersonal and communication skills, systems-based practice, and practice-based learning and improvement.
Milestones	A defined, observable marker of an individual's ability along a developmental continuum [16]. A stepwise progression of expertise (e.g., novice to expert).
EPAs	EPAs are essential professional work that is confined to qualified personnel. They are essential tasks performed within a time frame, are observable and measurable, and reflect 1 or more competencies. They are work or job descriptors [16]. An entry-level student, on graduation, licensure, and entrance into practice, would need to be entrusted to perform all essential activities (EPAs) without supervision.
Proficiency scales	A scale that focuses on the performance of an individual learner.
Entrustment supervision scales	A scale with levels of increasing autonomy. Assessor expresses the level or type of supervision a trainee requires for the safe and high-quality performance of an activity. These scales can be retrospective and prospective in nature.

*EPA = entrustable professional activities.
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competence and the specific competencies within each domain that capture the essence of the physical therapist profession across the learner continuum. Much work remains, as the health profession's community must come to consensus around expected performance outcomes at various stages of learning, practical methods of ensuring that individual learners have experiences that meet their unique needs, and reliable processes for ascertaining whether students' performance has met the expected level of competency.

Progressing toward a CBE curriculum is not without challenges. Development requires reframing curricular goals and learning objectives to reflect identified core competencies, modifying instructional approaches and learning experiences to directly target those competencies, and reshaping assessments and performance criteria to ascertain whether relevant competencies have been achieved [2]. Albanese et al. [17] suggested that creating a competency-based curriculum requires addressing how and when students need to demonstrate each competency, as well as how students' achievements will be documented and monitored. New roles for faculty teaching in competency-based curricula can be expected with greater focus on the observational description of student performance and recommendations for improvement, rather than on traditional grading [18].

CBE has been explored in medical education for decades, and the more recent literature provides guidance for education in other health professions [14,19–31]. Models of CBE have been published in health professions literature from nursing [25], dentistry [26], veterinary medicine [27,29], social work [19], pharmacy [20,28], and chiropractic [21]. Domains of competence, competencies, and milestones for physical therapist education were developed by the Canadian Physiotherapy Association in 2017 [22]. In the United States, competencies for physical therapy residency education have been developed [23,24], and domains of competence and competencies specifically for entry-level neurological and cardiovascular and pulmonary physical therapy have recently been published [14,31]. As noted above, the profession has organized a robust process of identifying domains of competence and competencies, however, that process is ongoing and will take some time. And the current national work does not include examples of how domains of competence, competencies, and milestones can be integrated within existing physical therapy programs. We are aware that some United States physical therapist education programs are moving ahead in developing CBE curricula, as are we. For those who wish to move forward, we believe this description will provide a real-world example of the process used by one program to develop domains of competence, competencies, and milestones that will inform efforts toward developing CBE across physical therapist education. Additionally, the application of a competency-based framework within one doctor of physical therapy program contributes to the evidence supporting the national efforts to encourage a shift towards CBE within the physical therapy profession.

The purpose of this paper is to describe an approach to developing a framework for CBE for a Doctor of Physical Therapy (DPT) curriculum using the steps described by Gruppen et al. [2]. We describe our approach to (1) developing and validating domains of competence and competencies related to each domain; (2) developing milestones; and (3) mapping milestones to the existing curricular assessments for a DPT program.

2. Methods

2.1. Development of a framework: domains and competencies

In 2018, the Institution's Department of Physical Therapy assembled a task force comprised of four physical therapy faculty and one staff member to develop a competency-based framework for the entry-level DPT program. Members of the task force were also members of the department's Outcomes Committee. The Outcomes Committee's responsibilities include collecting and analyzing student, faculty, and program data to support departmental decisions, program development, and student success. The task force began by completing a comprehensive review of literature related to CBE in physical therapy and across health professions such as medicine, social work, pharmacy, and chiropractic [19–30]. Published CBE frameworks were compared and contrasted, and considered in relation to core, guiding documents: the DPT program's and institution's mission and vision, the institution's core competencies for healthcare education, the patient-client management model of physical therapist practice [32], and the APTA Code of Ethics [33] (Table 2). From here the task force developed a framework similar to the one proposed by Englander et al. [8,34,35] to describe the relationship between domains, competencies, and milestones. Fig. 1 represents the framework along with further detail about the domains, competencies, and milestones developed by the task force. The figure models the relationship between domains of competence for physical therapist entry-level practice, the competencies within each domain, and milestones to ascertain progress towards meeting each competency during each year of the institution's 3-year DPT program.

The next step in the developmental process was to define and develop domains and competencies for each domain. The task force used a similar analysis approach to develop the domains and competencies that was used to develop the framework. Domains that were supported by the literature [19–30], those that were reflective of the institution's documents (Table 2), and those that were congruent with guiding documents of the physical therapy profession were developed [32,33]. A definition for each domain was developed using descriptions existing in prior literature [19–30] as a starting point and then tailoring the descriptions to be reflective of the values and objectives of the program, institution, and physical therapy profession. Next, competencies were developed for each domain with the following aims: (1) competencies would be comprehensive of the domain, and (2) competencies would represent behaviors for entry-level physical therapist practice. Entrustable professional activities (EPAs) were intentionally excluded from the framework because EPAs represent core skills that a health profession has agreed upon. The task force felt that constructing EPAs at an individual organization level was inconsistent with the purpose and intent of EPAs. Rather, the task force chose to focus on development of domains and competencies with the goal of developing revised program outcomes that would be more encompassing of the mission and values of the program and institution, and that would allow faculty to better support student progression throughout the program.

Table 2. Guiding documents for developing a competency-based education (CBE) framework.

Doctor of Physical Therapy Program Mission Statement[a]
The Doctor of Physical Therapy Program educates its graduates to be part of patient/client-centered, interprofessional practice in a dynamic and diverse healthcare environment where they are prepared to be leaders in education, clinical practice, scholarship, professional service, and community engagement.
Doctor of Physical Therapy Program Vision Statement[a]
Transform physical therapy education, research, and clinical practice for a healthier and more equitable world.
Institution's Mission Statement[a]
As an independent, interprofessional graduate school of health sciences, the Institution prepares health professionals and scientists to advance care for a diverse society through leadership in education, clinical practice, research, and community engagement.
Institution's Vision Statement[a]
Improving health outcomes and equity through innovative education and research.
Institution's Interprofessional Model for Patient and Client-Centered Teams (IMPACT) Core Competencies[a]
Professionalism, patient and client-centered care, communication, clinical decision making, systems-based practice, leadership.
American Physical Therapy Association (APTA) Patient/client Management Model [32]
Examination (referral), Evaluation, Diagnosis, Prognosis, Intervention, Outcomes
American Physical Therapy Association (APTA) Code of Ethics [33]

[a] This information was retrieved from the Institution's website and accessed on 8/2023.

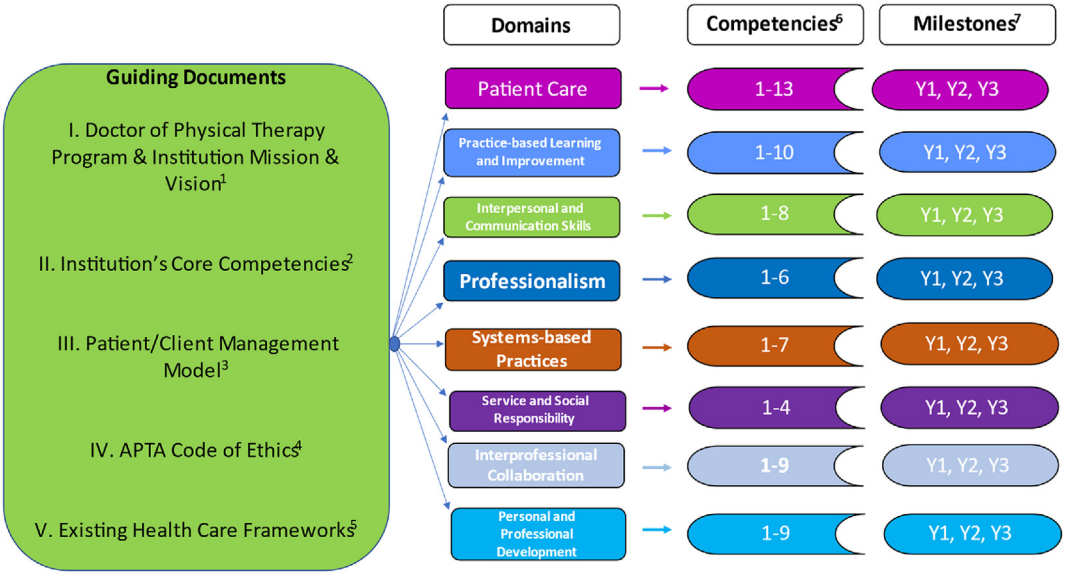

Fig. 1. A Framework for competency-based education: domains, competencies, and milestones. 1. Doctor of Physical Therapy Program & Institution's Mission & Vision (Table 2). 2. Institution's Core Competencies (Table 2). 3. American Physical Therapy Association (APTA) Patient/Client Management Model [32]. 4. American Physical Therapy Association (APTA) Code of Ethics [33]. 5. Existing Healthcare Frameworks [19–30]. 6. Competencies (Table 3). 7. Milestones (Appendix B (https://hpe.researchcommons.org/cgi/viewcontent.cgi?filename=0&article=1173&context=journal&type=additional&preview_mode=1)).

2.2. Content validation of domains and competencies: expert panel

The task force sought content validation of the drafted domains and competencies through use of an expert panel. The overall goal of incorporating the expert panel was to solicit feedback about the clarity of the content within the domains, definitions, and competencies and to verify whether the domains and competencies comprehensively represented students' progression through a DPT program with the outcome of entry-level practice. Specifically, the expert panel was invited to review the domains and competencies developed by the task force and provide opinions about whether the competencies were representative of the domain and the domain's definition, and, to identify which competencies, if any, are not representative of the domain. Potential expert panel members were identified via a compiled list of the DPT program's clinical partners, including clinical faculty, clinicians, alumni, and clinical managers (professionals who supervise physical therapists). Additionally, to gain a broader perspective of educational outcomes, experts in curricular design with or without affiliation to the institution and with expertise outside of the physical therapy profession were invited.

The task force anticipated that at least two rounds of expert panel review would be necessary (i.e., one round of initial feedback followed by task force revision, then, a second round for the expert panel to review the revisions). However, participants were asked to agree to participate in up to 4 rounds of review in the event there were challenges reaching agreement. Any suggested revisions to the original domains and competencies would trigger a discussion by the task force and voting for consensus, followed by a round of review from the expert panel. Consensus was defined as agreement among the majority (3 or more) of task force members. This process of review by the expert panel, discussion by the task force, and voting for consensus by the task force would continue until no additional revisions were suggested by the expert panel. During the first round of the process, the expert panel was asked to answer 2 questions for each competency and 2 overall summary questions: (1) Do the competencies match the domain and its descriptors? (2) Are there competencies listed as part of the domain that are not highly relevant and should be removed? (3) Are there any domains or competencies that you feel are missing? (4) As a whole, do you feel that these domains and competencies appropriately represent the essential skills of a physical therapist at entry to practice? Each participant had the opportunity to provide additional comments for each question. Study data were collected and managed using REDCap electronic data capture tools hosted at the institution [36,37].

Responses from the expert panel were analyzed using quantitative analyses and qualitative analyses. The task force used frequencies and percentages to

summarize the quantitative results and content coding to summarize the qualitative responses from the expert panel. Emerging themes were identified by the task force and categorized for each domain.

2.3. Milestones

Following validation of the domains and competencies, the task force, along with input from the DPT program's faculty, developed milestones for each competency. The task force developed the first draft of milestones. The DPT program's faculty reviewed the drafted milestones and provided feedback during an open discussion at a scheduled faculty meeting. The milestones were intended to be developmental in nature, based on the structure of the DPT program's curriculum, and evaluative of students' clinical readiness. The milestones represented indicators of measurement for expected behaviors of DPT students at the completion of their first year, second year, and third year of study, immediately preceding full time clinical experiences. For example, year one milestones were reflective of behaviors expected during the first year of the program for the specific competency. Milestones for year two and year three were developed to represent advancement of the behaviors represented by the year one milestone and still associated with the specific competency. One example of a domain, description of the domain, one competency within the domain, and the progression of milestones associated with the competency is the following: Patient Care domain: Physical therapists integrate foundational and clinical sciences and use shared decision making with patients and families to achieve desired health outcomes. Competency 1.1: Plans/performs a comprehensive screening and testing process that includes history, systems review, and specific and selective tests and measures as indicated by patient/client presentation. Milestone 1: Conducts elements of a physical therapy evaluation (screening and testing process) for non-complex patient/client presentations accurately and safely with supervision. Milestone 2: Conducts a comprehensive evaluation accurately and safely for non-complex patient/client presentations with guidance and complex patient/client presentations with supervision. Milestone 3: Conducts a comprehensive evaluation process sequentially and independently for non-complex patient/client presentations and independently with or without confirmation for complex patient/client presentations. In this example the level of patient complexity as well as the required level of professional supervision for performance of a clinical skill defines the progression of the milestone.

2.4. Mapping process

Following the development of milestones, faculty teams from each course within the DPT program mapped graded course assessments to milestones using Exxat Prism software (Exxat, Inc., 2022 and 2023). Faculty were instructed to consider which graded course assessments were most representative of a milestone, and therefore, the associated competency. The benchmark for achieving a milestone was based on the passing criteria as defined by the DPT program: achievement of at least a 73% on a graded course assessment, and/or passing criteria based on a rubric for a pass/fail course assessment. If faculty determined that an assessment could not sufficiently determine if a student had successfully met a milestone, then it was not mapped. Additionally, faculty were to consider that a course assessment may align with a year-one, year-two, or year-three milestone regardless of when in the curriculum the course assessment occurred. For example, a course assessment occurring during the first year of the program could be mapped to a year-two or year-three milestone. A main goal of mapping the milestones to course assessments was to evaluate the extent to which there was comprehensive coverage for all milestones, and therefore, competencies within the institution's DPT program. Fig. 2 outlines the timeline of the DPT program's CBE framework developmental process.

3. Results

3.1. Domains and competencies

Eight domains of competence were identified and defined: patient care, practice-based learning and improvement, interpersonal and communication skills, professionalism, systems-based practices, service and social responsibility, interprofessional collaboration, and personal and professional development (Table 3).

A total of 66 competencies were drafted by the task force that represented behaviors for entry-level physical therapist practice. Faculty members of the DPT program reviewed the drafted domains, definitions, and competencies during a faculty meeting and modifications were made to the domains, definitions, and competencies during that time.

3.2. Content validation results

Eighty experts were invited via email to participate in the survey validation of the drafted domains and competencies. A total of two rounds comprised the

Fig. 2. Timeline for the competency-based education (CBE) framework developmental process.

survey process that solicited written feedback and suggested edits to the proposed domains and competencies developed by the task force [38]. Of the 80 invited experts, 65 (response rate: 81.3%) confirmed participation in the first round of the survey process and made up the expert panel. Of the 65 participants from the first round, 11 (response rate: 16.9%) participated in the second round. Table 4 describes characteristics (professional role(s), years of clinical practice, type of board certification, and practice setting) for the participants from rounds 1 and 2.

Table 5 summarizes the expert panel responses for both rounds of the survey process. Of the 65 respondents 46 (71%) provided one or more narrative comments. One example of a common suggestion across the expert panel from the first round was clarification on the terminology used throughout the domains and competencies. As a result, a glossary of terms (Appendix A) (https://hpe.researchcommons.org/cgi/viewcontent.cgi?filename=0&article=1173&context=journal&type=additional&preview_mode=1) was created by the task force along with faculty input to clarify and operationally define terminology. As another example, when it was suggested that a competency should be removed from the original domain, moved to another domain, or an additional competency added to a domain, the task force discussed the suggestion/comment including potential outcomes for the revisions/modifications followed by a vote.

A second round of feedback was solicited from the 65 initial participants to validate the glossary of terms and modifications made to the domains, definitions, and competencies. Survey questions from round 2 were developed by the task force and informed from the expert panel feedback from round 1. Questions included the following: (1) From this revised domain and its competencies, does the domain reflect the requirements of entry-level practice? (2) If you feel that we have not interpreted your comments as intended or that a response was not provided, please explain. (3) From this revised domain and its competencies, are there additional terms you would add to the glossary? (4) Now that you have reviewed all the revised domains and their related competencies, as a whole do you feel the domains reflect the requirements of entry-level practice?

The task force analyzed the responses from the second round (Table 5) using a similar approach to the first round. After the second round of review by the expert panel, either no additional revisions to the

Table 3. Domains, definitions of domains, and competencies.

DOMAINS (Guiding Documents)	DEFINITION	COMPETENCIES
Patient Care (I−V)	Physical therapists integrate foundational and clinical sciences and use shared decision making with patients and families to achieve desired health outcomes.	1. Plans/performs a comprehensive screening and testing process that includes history, systems review, and specific and selective tests and measures as indicated by patient/client presentation. 2. Integrates findings from the evaluation with patient/client preferences to establish a plan of care taking into consideration patient desired outcomes, discharge planning, and the need for interprofessional collaboration and referrals. 3. Establishes a movement-system diagnosis based on evaluative findings that describe the patient/client condition and the impact on function in terms that will guide the ongoing management of the plan of care. 4. Assesses prognostic factors to determine the predicted response to potential interventions. 5. Implements interventions based on initial and ongoing evaluation findings to meet patient/client needs according to patient/client presentation, goals, and resources. 6. Performs outcomes data collection and analysis to guide the provision of physical therapy services and for practice improvement measures. 7. Implements a continual process of patient assessment that includes responding to emerging findings and urgent/evolving situations to ensure patient safety and desired outcomes. 8. Appraises and responds to the impact of social determinants of health and patient/client preferences across the episode of care. 9. Incorporates concepts of health promotion and wellness into physical therapist practice to reduce the impact of disease and disability and to promote population health. 10. Determines the degree of direction and supervision needed and maintains accountability for services provided when working with physical therapist assistants, physical therapy aides, and other support personnel. 11. Documents complete and accurate record of care/services provided and the individual's response to intervention that is compliant with federal, state, payer, local, and organizational regulations. 12. Discusses findings and collaboratively establishes a plan of care and goals. 13. Determines need for referral to other health care providers.

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Table 3. (continued)

DOMAINS (Guiding Documents)	DEFINITION	COMPETENCIES
Practice-Based Learning and Improvement (I–V)	Physical therapists utilize an evidence-based framework, self-reflection and insight, and external feedback to support clinical decisions and to continuously advance their practice.	1. Constructs searchable foreground and background questions that can inform clinical decision making related to diagnostic tests, clinical measures, prognostic factors, interventions, and clinical prediction rules. 2. Accesses the best available evidence, emerging evidence and/or clinical expertise using appropriate and reliable resources to answer clinical questions. 3. Critically appraise evidence's validity and clinical importance, acknowledging potential sources of bias, to interpret and determine applicability to individual patients. 4. Integrates personal knowledge and experience, patient preferences, and research evidence into clinical decision-making acknowledging availability or limitations of resources. 5. Applies best practice principles when making clinical decisions in situations of ambiguity or limited evidence. 6. Analyzes outcome data to determine effectiveness of care and to identify areas for improvement. 7. Employs reflective practice principles to critically analyze one's clinical practice. 8. Demonstrates self-awareness of one's decisions, actions, and errors in clinical performance. 9. Constructively seeks out and integrates external feedback on clinical performance. 10. Develops a plan of action to address immediate self-identified learning needs to improve clinical practice.
Interpersonal and Communication Skills (I–V)	Physical therapists apply expressive and receptive communication and active listening skills to appreciate cultural and contextual factors to develop shared understandings in all interactions.	1. Aligns expressive and receptive communication strategies with listener needs. 2. Communicates effectively in writing with all stakeholders. 3. Applies active listening skills in all interactions. 4. Effectively uses available communication tools and technologies to meet communication needs. 5. Adapts communication approach according to context and medium. 6. Employs self-reflection and self-assessment on communication effectiveness in all interactions. 7. Demonstrates an appreciation of diversity and inclusion in all communications. 8. Provides feedback in a constructive manner.
Professionalism (I–V)	Physical therapists, as members of a profession, uphold the APTA's code of ethics, core values, and professional standards, adhere to legal and fiduciary responsibilities, and demonstrate integrity and excellence in all interactions.	1. Complies with all applicable rules and regulations of physical therapist practice. 2. Adheres to the APTA's Code of Ethics and Core Values of Professionalism. 3. Acts within personal scope of practice. 4. Manages real, potential or perceived conflicts of interest. 5. Regulates behavior in professional situations. 6. Actively engages in professional organizations.

Systems-based Practices (I−V)	Physical therapists work across the health care continuum to coordinate care, consider costs, weigh risks versus benefits, advocate for quality, and participate in error detection and prevention within the context of health policy.	1. Recognizes improvement opportunities and advocates for system-based changes. 2. Delivers care in the context of current local, state, and federal health policy. 3. Understands current payment policies across the health system. 4. Advocates for access to high-quality care for all individuals. 5. Responds to community or global health challenges as healthcare providers. 6. Practices with the awareness of one's impact on system-based outcomes. 7. Understands the factors associated with practice sustainability across various practical models.
Service and Social Responsibility (I, II, IV,V)	Physical therapists address societal needs for health and wellness by promoting health equity and access to care through local, state, and national advocacy.	1. Advocates for the Profession across the local, state, and federal levels. 2. Advocates for health and wellness of patients/clients and communities. 3. Recognizes health disparities and advocates for the remediation for health inequalities. 4. Engages in activities to promote population wellness and health.
Collaboration (I−V)	Physical therapists are active members of interprofessional teams that recognize and appreciate the contributions of all team members and share accountability for patient care and outcomes.	1. Work with individuals of other professions to facilitate and maintain a climate of mutual respect and shared values. 2. Educates others about the physical therapist's role/responsibilities, and knowledge. 3. Demonstrates knowledge and respect of the roles and responsibilities of others. 4. Participate in shared leadership. 5. Share accountability for delivery of patient care and for patient outcomes. 6. Engage patient/client and family/caregivers as members of the team. 7. Recognize conflict or potential conflict and respond constructively. 8. Negotiate shared and overlapping roles, responsibilities, and decision making across professions to appropriately assess and address the health care needs of patients. 9. Apply relationship-building values and principles of team dynamics to effectively meet patient care needs and to establish a safe and collaborative workplace.
Personal and Professional Development (I−V)	Physical therapists engage in life-long personal and professional growth that emphasizes self-awareness and self-assessment of clinical care and professional responsibilities and are equipped to lead in an evolving health care system.	1. Demonstrates responsibility for continuous professional learning and growth within and beyond the practice environment. 2. Provides mentorship and constructive feedback to the team members on performance, behaviors and goals. 3. Employs self-assessment and reflection to identify the need for additional learning experiences to enhance professional development and reassess on a regular basis. 4. Recognizes and practices within the continuously changing health care system and the evolving scope of practice. 5. Demonstrate preparedness for professional leadership. 6. Translates scientific knowledge into practice and/or participates in research activities. 7. Promotes innovation to advance health. 8. Solicits and integrates external guidance for personal and professional development. 9. Employs selfcare techniques and strategies to promote personal well-being.

Core elements that were integrated into the development of the domains and competencies are listed below each domain and include the following.
I. Doctor of Physical Therapy Program's and Institution's Mission and Vision.
II. Institution's Interprofessional Model for Patient and Client-centered Teams (IMPACT) Core Competencies.
III. American Physical Therapy Association (APTA): Patient/client Management Model [34].
IV. American Physical Therapy Association (APTA) Code of Ethics [35].
V. Existing Health Care Frameworks [19−30].

Table 4. Survey respondent characteristics.

	Round 1 N = 65 N (%)	Round 2 N = 11[a] N (%)
Practitioner Role[b]		
Clinical Instructor	28 (43.1)	3 (27.2)
Student Alumni	35 (53.8)	1 (9.1)
Supervisor/Manager	13 (20.0)	1 (9.1)
Clinician-Lab Instructor	18 (27.7)	2 (18.1)
Non-PT	1 (1.5)	0 (0)
Site Coordinator of Clinical Education (SCCE)	15 (23.1)	2 (18.1)
Years of Clinical Practice		
0–5	20 (30.8)	0 (0)
6–10	11 (16.9)	1 (9.1)
10–15	8 (12.3)	1 (9.1)
15–25	9 (13.8)	1 (9.1)
>25	17 (26.2)	2 (18.1)
Board Certified Clinical Specialist		
Cardiovascular and Pulmonary	1 (1.5)	0 (0)
Clinical Electrophysiologic	0 (0)	0 (0)
Geriatric	4 (6.2)	1 (9.1)
Neurologic	5 (7.7)	0 (0)
Oncology	0 (0)	0 (0)
Orthopedic[c]	10 (15.4)	2 (18.1)
Pediatric[c]	4 (6.2)	0 (0)
Sports	0 (0)	0 (0)
Women's Health	0 (0)	0 (0)
None	42 (64.6)	2 (18.1)
Practice Setting[d]		
Academic Institution	5 (7.7)	0 (0)
Acute care hospital	10 (15.4)	2 (18.1)
Acute care hospital/Skilled Nursing Facility (SNF)	1 (1.5)	0 (0)
Acute care hospital/hospital-based outpatient	5 (7.7)	0 (0)
Acute care and home care	1 (1.5)	0 (0)
Health and Wellness Facility	3 (4.6)	0 (0)
Home care	5 (7.7)	0 (0)
Hospital-based Outpatient	17 (26.2)	2 (18.1)
Industry	1 (1.5)	0 (0)
Inpatient Rehabilitation Facility (IRF)	8 (12.3)	0 (0)
Private Practice	13 (20.0)	1 (9.1)
Research Center	2 (3.1)	0 (0)
School System	2 (3.1)	0 (0)
SNF	3 (4.6)	0 (0)

[a] 6 of the 11 respondents did not identify themselves for Round 2.
[b] Some survey respondents identified >1 practitioner role.
[c] One participant identified 2 board certifications: Pedi and Ortho.
[d] Some survey respondents selected multiple practice settings.

domains, definitions, or competencies were provided, and no further detail was suggested for the glossary of terms. Overall, participant comments were considered and incorporated into both rounds of revisions when the suggestions supported the primary objectives of the CBE framework: developing competencies that were comprehensive of the domain and ensuring that competencies represent behaviors for entry-level physical therapist practice. Where there was perceived overlap of constructs the task force modified competencies to minimize redundant concepts. At the conclusion of the second round, a list of domains, definitions, and competencies (Table 3), as well as a revised glossary of terms were finalized (Appendix A) (https://hpe.researchcommons.org/cgi/viewcontent.cgi?filename=0&article=1173&context=journal&type=additional&preview_mode=1). The 65 initial participants (which included the 11 participants from round 2) were provided with an overall summary of the task force's decisions, including individual participant's responses, and the task force's response to each comment. In instances where the task force decided not to make a suggested change to a domain or competency, the task force provided their rationale to the participants.

3.3. Milestones and mapping

A total of 198 milestones (3 milestones for each of the 66 competencies) were developed by the task force in coordination with faculty from the DPT program (Appendix B) (https://hpe.researchcommons.org/cgi/viewcontent.cgi?filename=0&article=1173&context=journal&type=additional&preview_mode=1). The mapping process identified coverage for 100% of competencies and all but 2 milestones within the Professionalism domain: (1) attends at least one professional meeting per semester (e.g., Special Interest Group (SIG), district, non-APTA meeting), and (2) contributes to a professional organization by joining such organization and contributing to the mission of that organization. While the task force and expert panel agree that these milestones are essential professional abilities of a physical therapist, the DPT program did not have specific and graded course assessments that link to these milestones.

4. Discussion

Our department of physical therapy developed and validated a CBE framework reflective of entry-level practice for DPT students that integrates the DPT program's and institution's mission and vision, the institution's core competencies for healthcare education, the patient-client management model, APTA's Code of Ethics for physical therapist practice, and an appraisal of competency-based literature across various health professions. The CBE framework includes domains of competence, competencies with comprehensive definitions that represent the corresponding domain, and milestones that are measurable and linked to specific assessments within the DPT curriculum. The CBE

Table 5. Summary of survey responses (Rounds 1 & 2).

ROUND 1		
	Yes	**No**
Patient Care		
Do the competencies match the domain and its descriptors?	65	0
Are there competencies listed as part of the domain that are not highly relevant and should be removed?	3	62
Respondents comments: move item 11 to another domain; additional item concerning re-assessment using EBP pillars; "foundational and clinical sciences" is too broad; "movement system diagnosis" is limiting, suggest "physical therapy diagnosis"; additional competency to include patient communication; additional competency to include PT's ability to work within constraints of health insurance limitations; remove item 10		
Practice-Based Learning		
Do the competencies match the domain and its descriptors?	64	1
Are there competencies listed as part of the domain that are not highly relevant and should be removed?	1	64
Respondents comments: include reference to cultural competence; include plan of action for improvement at the institutional, departmental or population level; move #3 to patient care domain; suggested rewrite-critical appraisal of evidence for use in one's own practice, given setting and demographics vs individual; include interpretation of data to #3; #7–8 redundant with competencies in personal and professional development domain; move 9–10 into personal and professional development domain; define "best practice principles"; emphasis for importance of the ability to be self-aware and self-reflect; include "available resources" to #4; suggest interdisciplinary approach may be beneficial to minimize risk; suggest addressing immediate self-identified learning needs but also anticipates future needs; suggest change in name of domain relevant to #3, #5-"practice-based learning, improvement, and decision making"; suggests "evidence informed practice"; define foreground and background questions; suggest "emerging evidence and clinical expertise." for #2; move #9 higher on list		
Interpersonal and Communication Skills		
Do the competencies match the domain and its descriptors?	64	1
Are there competencies listed as part of the domain that are not highly relevant and should be removed?	1	64
Respondents comments: including seeking and responding to feedback; wording too broad-suggest "effectively uses adaptive technology to meet communication needs"; include health literacy; add language "with all stakeholders" to #3 and remove #5; add self-reflection; add peer communication, interprofessional communication, ability to accept constructive criticism; remove writing to increase communication domain; "is open and willing to receive feedback from external sources"; include non-verbal communication, expressive communication; include self-awareness and taking responsibility for miscommunication; move active listening from description to competency; communication skills should include how to best influence patient's actions/behaviors; provides and received feedback; clarification to wording in #8; include willingness to communicate via translator; importance of communication with colleagues, patients, families; ability to communicate using clear written communications; clarify #3 regarding writing and stakeholders;		
Professionalism		
Do the competencies match the domain and its descriptors?	65	0
Are there competencies listed as part of the domain that are not highly relevant and should be removed?	7	58
Respondents comments: suggest edits to language to improve acceptable standards; question feasibility of #6; move #5 to communication skills; See Jensen et al., 2017. "Commitment to patient primacy." "Moral obligation to put the patient and client needs ahead of personal needs."; personal scope of practice is unclear; broaden professional organizations to include community service-type activities in a professional capacity; question relevance of professionalism defined by participation in organizational activities; change wording of #6 from organizations to settings; include timeliness, dress code, cell phone use; #2 consistently adheres; #3 acts within highest level of personal scope of practice; include professional behavior and presentation; include "consistently"; compliance with State practice act; include conflict resolution; include understanding influence of 3rd party payor; include responding to error and accountability		
Systems-based Practice		
Do the competencies match the domain and its descriptors?	65	0
Are there competencies listed as part of the domain that are not highly relevant and should be removed?	3	62
Respondents comments: #3 is stated to narrowly, understand how health policies in general impact the delivery of health care, demonstrate engagement to effect changes that benefit pts and communities; clarify #7; change wording from "understands" to "applies"; clarify #6; include supervision of PTAs and aides; consider removing #'s 1,4,5,7, these are advanced skills; include issues on cost, quality, access, and innovation; change wording of "affordable"; question relevance of #4, #5; clarify #6		
Service and Social Responsibility		
Do the competencies match the domain and its descriptors?	64	1
Are there competencies listed as part of the domain that are not highly relevant and should be removed?	1	64

Respondents comments: suggest adding global health, change "disabilities" to "health care needs"; include more than just disabilities, include participation in societal roles; clarify disparities; question #4 redundant with professionalism competency; include using people first language; expand to include societal needs, promote health equity and access, and access health equipment; remove state and national advocacy; add cultural humility and cultural acceptance/understanding		
Interprofessional Collaboration		
Do the competencies match the domain and its descriptors?	64	1
Are there competencies listed as part of the domain that are not highly relevant and should be removed?	0	65
Respondents comments: #7 needs clarification, manage conflict that impacts care and outcomes; #8 and #9 are similar; suggest moving #2 to systems-based practice, suggest moving #6; include interprofessional or team; clarify how and when PTs delegate to supportive personnel, PTA's, aides and family members; #5, 7, 9 are challenges for students; include understanding business operations; include participation in national organization as professionalism;		
Personal and Professional Development		
Do the competencies match the domain and its descriptors?	65	0
Are there competencies listed as part of the domain that are not highly relevant and should be removed?	3	62
Respondents comments: question the expectation for #5–7 as simultaneous competencies; clarify "beyond" practice, question relevance of mentorship, leadership is too broad, include measurable behaviors; clarify #7; broaden #2 to include any professionals on a team, suggest demonstrate preparedness for professional leadership, broaden #6 to participate in generation of new knowledge and evidence-based practice; include equal access to health care; include management, business and insurance understanding of physical therapy; question overlap with learning and improvement domain, clarify personal vs professional references; include re-framing failures as new learning opportunities; include provide and effectively receive mentorship and constructive feedback; clarify #5 across different practice settings		
Are there any domains or competencies that you feel are missing?	6	59
Respondents comments: add to professionalism domain-clinical teaching and working with students; question access to tools for service and social responsibility; include shared decision making with patient care; professionalism and personal and professional development are similar; include business aspect of physical therapy; include psychomotor skills; include concise documentation; potential overlap of patient care and learning/improvement, as well as learning/improvement and professional development; importance self-reflection and assessment; include self-care, avoidance of burnout, balance; this reflects high standards of competencies commensurate with Doctor of Physical Therapy title, well done; very comprehensive; very thorough and comprehensive		
As a whole, do you feel that these domains and competencies appropriately represent the essential skills of a physical therapist at entry to practice?	65	0
Respondents comments: build in resilience and ability to be reflective; ensure that it is clear that safe and effective patient care is our top priority, patient advocacy in all situations, Ensure that it does not appear that membership in our professional organization is perceived as more important than the provision of excellent, safe and effective patient care; suggest that some competencies will be learned after entry-level; important to include self-assessment of communication; suggest the challenge in assessing the competencies; clear for setting expectations for clinical instructors and students; challenged with workload of assessing students as a clinical instructor; suggest improving competencies for 3rd party payors and professionalism; competencies are well outlined; a good representation of high quality education; competencies represent a very solid foundation of what is necessary to be a well-rounded practitioner.		

ROUND 2

	Yes	No
Patient Care		
From this revised domain and its competencies, does the domain reflect the requirements of entry-level practice?	11	0
If you feel that we have not interpreted your comments as intended or that a response was not provided, please explain. Respondent comments: Domain should include determining need to refer to other services, not just health care providers.		
From this revised domain and its competencies, are there additional terms you would add to the glossary?	2	9
Respondent comments: include or expand upon: patient care, movement system diagnosis, population health, social determinants of health		
Practice-based Learning		
From this revised domain and its competencies, does the domain reflect the requirements of entry-level practice?	11	0
If you feel that we have not interpreted your comments as intended or that a response was not provided, please explain. Respondent comments: None		
From this revised domain and its competencies, are there additional terms you would add to the glossary?	2	9
Respondent comments: include searchable foreground and background questions, interdisciplinary approach		

Interpersonal Communication and Skills		
From this revised domain and its competencies, does the domain reflect the requirements of entry-level practice?	11	0
If you feel that we have not interpreted your comments as intended or that a response was not provided, please explain. Respondent comments: additional clarification on development of new competencies and glossary terms; suggestion for diversity " … demonstrates competence, proficiency and appreciation for diversity and inclusion in all communication".		
From this revised domain and its competencies, are there additional terms you would add to the glossary?	4	7
Respondent comments: none provided by respondents		
Professionalism		
From this revised domain and its competencies, does the domain reflect the requirements of entry-level practice?	11	0
If you feel that we have not interpreted your comments as intended or that a response was not provided, please explain. Respondent comments: none		
From this revised domain and its competencies, are there additional terms you would add to the glossary?	1	10
Respondent comments: include regulates behavior		
Systems-based Practices		
From this revised domain and its competencies, does the domain reflect the requirements of entry-level practice?	11	0
If you feel that we have not interpreted your comments as intended or that a response was not provided, please explain. Respondent comments: question measurability of "understands"; healthcare providers is too vague; suggest adding practices with awareness and is accountable for one's impact on system-based outcome		
From this revised domain and its competencies, are there additional terms you would add to the glossary?	3	8
Respondent comments: include practice sustainability		
Service and Social Responsibility		
From this revised domain and its competencies, does the domain reflect the requirements of entry-level practice?	11	0
If you feel that we have not interpreted your comments as intended or that a response was not provided, please explain. Respondent comments: include advocating for access to healthcare		
From this revised domain and its competencies, are there additional terms you would add to the glossary?	0	11
Respondent comments: none		
Collaboration		
From this revised domain and its competencies, does the domain reflect the requirements of entry-level practice?	11	0
If you feel that we have not interpreted your comments as intended or that a response was not provided, please explain. Respondent comments: #'s 5 and 8 seem redundant		
From this revised domain and its competencies, are there additional terms you would add to the glossary?	0	11
Respondent comments: none		
Personal and Professional Development		
From this revised domain and its competencies, does the domain reflect the requirements of entry-level practice?	11	0
If you feel that we have not interpreted your comments as intended or that a response was not provided, please explain. Respondent comments: it is very nice to see that self-care/self-resilience was included; revise #7 for clarity		
From this revised domain and its competencies, are there additional terms you would add to the glossary?	1	10
Respondent comments: self-resilience when giving feedback		
Overall		
Now that you have reviewed all the revised domains and their related competencies, as a whole do you feel the domains reflect the requirements of entry-level practice?	11	0

framework is consistent with the recommendation put forth by Frank et al. [4] including clearly defined domains, competencies, and milestones that are reflective of the program's curriculum.

A unique aspect and strength of our CBE framework was incorporating the mapping process. Mapping existing assessments to milestones and, in turn, competencies, allows the program to measure student achievements and program outcomes in a comprehensive and robust way that is reflective of the program's mission, vision, and values, and supports student progression throughout the program. Previously, in our DPT program, course assessments had only been considered within the context of a course, rather than within the broader context of program outcomes as our CBE framework proposes. Additionally, aligning the milestones prior to the start of each clinical experience provides a novel method of assessing clinical readiness in a structured and objective format.

A notable outcome of the mapping process was the recognition that for certain milestones there

were multiple assessments linked to that milestone. One of the goals of our DPT program is to provide students with multiple and varied methods of demonstrating mastery of behaviors for entry-level physical therapist practice. Our mapping process identified that learners have multiple opportunities to be assessed on certain competencies in varied ways and at different time points. One suggestion to improve the mapping process for future work may be to broaden the criteria to include both graded and ungraded assessments. While this proposed change may require modification to current assessments it may provide more opportunities for students to achieve competencies. Conversely, having multiple assessments mapped to a milestone may draw concern that there are redundant and potentially unnecessary assessments within a curriculum. While redundancy impacts efficiency it is important to offer multiple ways to achieve a competency and demonstrate continued competence over time. The mapping process is advantageous as it allows for programs to survey their assessments for efficiency and ensure that assessments are targeted toward competencies reflective of entry level physical therapists, and that redundancy is integrated purposefully and not unnecessarily. To this end, as data is collected on student performance within the curriculum in the context of this new framework, the DPT program will carefully monitor those milestones with multiple, mapped assessments to make determinations about unnecessary versus purposeful redundancy.

The mapping process identified milestones related to the professionalism competency, specifically, membership and engagement in professional organizations, which did not link to assessments. The competency was validated and determined to be a necessary skill required of a physical therapist by the task force and expert panel. However, the DPT program did not have graded assessments for the milestones. One suggestion may be to modify achievement criteria for this milestone. Rather than have requirements around membership to organizations DPT programs can assess students on activities that model behaviors and skills occurring within professional organizational structures. Competency of the developing skills within the simulated activities can be reflective of eventual behaviors exhibited as members of professional organizations. For example, the DPT program reflected in this paper holds a mock House of Delegates within a course. All students participate in this in-class activity and learn skills such as advocacy and governance that represent professional behaviors expected of an entry level physical therapist. Another important consideration before implementing a milestone such as this, is that membership and engagement in professional organizations can place a financial burden on students and inclusivity is challenged if students are expected to be financially responsible for costs outside of tuition fees that are already challenging. DPT programs can explore methods to offer financial support such as grant or scholarship resources to students to encourage equitable involvement in professional activities.

Another strength of the proposed CBE framework was its validation from the panel of experts who represented physical therapy educators as well as clinicians with various board certifications and specialty practice across various settings. However, the timing of the surveys posed a limitation to the process. Two rounds of surveys comprised the validation process. The first round included responses from 65 participants and the second round included 11 participants. One major reason for the marked reduction in survey responses for round 2 was due to the COVID-19 pandemic. Communication and data collection for round 1 was emailed during 2019, prior to the pandemic, while the second round of communication and data collection occurred during the first few months of the pandemic in 2020. The expert panel included clinicians and academics who were managing many life and occupational transitions during this time, thereby, contributing to the high attrition rate for participants in the survey process.

Van Melle described five core components of competency-based medical education as 1) outcome competencies, 2) sequenced progression, 3) tailored learning experiences, 4) competency-focused education, and 5) programmatic assessment [39]. Our work thus far has focused on the development of competencies and a sequenced progression. Our next proposed step in the CBE process involves identifying steps toward implementation of CBE that will focus on tailored learning experiences and competency-focused education. One of the primary objectives will be to begin to define how the accomplishment of competencies can be learner-centered, time-based, and flexible based on the DPT program's curricular structure. Although physical therapy professional organizations (APTA, ACAPT, and the APTA-AOE) have active workgroups identifying domains of competence and related competencies [3], the work is slow by necessity, and the current literature [14,22,23,31] includes few models for implementing CBE in physical therapy education. The paucity of exemplars is attributable in part to the many pragmatic challenges of implementing a CBE process [12,40,41]. A key barrier to

implementation of CBE is the need for a cultural shift among academic and clinical faculty. Achieving buy-in and a commitment from faculty to transition to a CBE curriculum can be impeded by perceptions that CBE, (1) places a heavy emphasis on minimal standards, (2) that competencies cannot capture the complex nature of human behaviors or the holistic concept of a health care provider, (3) that the process can be burdensome with checklists and documentation, (4) that CBE devalues the role of educators, (5) that there is the potential to "teach to the test" and limit valuable and necessary educational information, and (6) that the time process of transitioning to a time flexible program poses significant logistical challenges that impact multiple entities within the organization and beyond [12,42,43].

Even after a program has made the decision to transition to CBE and gained the support and dedication of the faculty, additional barriers to implementation exist. These include (1) buy-in and dedicated support of administration and leadership, (2) substantial support to facilitate a cultural shift amongst academic and clinical faculty, (3) development of shared terminology, (4) resources dedicated to faculty development around CBE in general as well as for the development and execution of assessment of competencies and milestones, (5) commitment of faculty time, and (6) consensus building among faculty for competency selection and assessments [8,12,44]. Additionally, accreditation standards will likely be met in new and diverse ways, requiring greater flexibility by CAPTE. While not insurmountable, addressing these barriers will consume program and organizational time and resources and should be thoroughly addressed prior to implementation.

Perhaps the greatest challenge of CBE is the time-flexible nature of the approach [45]. While the suggested framework doesn't address the true time-based aspect of CBE [4], the mapping process identified instances where certain milestones could be achieved earlier or later in the curriculum. For example, certain year 3 milestones linked with assessments associated with courses offered during years 1 or 2. Despite the opportunities for learners to achieve competencies at various time points within the DPT curriculum, there is still room for exploring methods to offer flexible curricular time frames to meet individual learner's needs. CBE may help to highlight areas of performance that need more practice and knowledge attainment for students, however, the logistics of implementing systems to allow more time to achieve required outcomes are complex particularly for institutions with tuition structures based on credit hours, curricula based on semesters where each semester's coursework is prerequisite for the next semester, and time-based accreditation requirements. Additionally, the variability associated with individualizing learners' needs may impose substantial resource strains when transitioning to a CBE curriculum [7].

Finally, although the CBE framework developed for our DPT program provides competencies reflective of an entry-level physical therapist, further work will be necessary to develop strategies to assess the competence of necessary skills and for effective and efficient implementation. For example, new, reliable assessment tools will likely need to be developed to assure accurate assessment of students' performance, to allow helpful feedback to be provided to students, and to assure their level of capability [46]. Additionally, a comprehensive plan for assessing the implementation and ongoing use of CBE within the DPT program will need to be formulated. Assessment at the program level will likely inform ongoing revisions to the framework and provide insight into the feasibility and applicability of the framework with the potential to inform other physical therapy programs.

We welcome our colleagues to adapt and adopt our work as they consider developing a CBE model. As more programs use such models, there will be opportunities to share lessons learned, make further positive adaptations, and conduct research related to the process and its outcome for physical therapy education.

Ethics statement

This study's methods were carried out in accordance with the Declaration of Helsinki. This study was exempt from Institutional Review Board (IRB) approval.

Disclosure

None.

Other disclosures

None.

Conflict of interest

The authors declare no conflicts of interest.

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