National Study of Excellence and Innovation in Physical Therapist Education: Part 2—A Call to Reform

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This perspective shares recommendations that draw from (1) the National Study of Excellence and Innovation in Physical Therapist Education research findings and a conceptual model of excellence in physical therapist education, (2) the Carnegie Foundation's Preparation for the Professions Program (PPP), and (3) research in the learning sciences. The 30 recommendations are linked to the dimensions described in the conceptual model for excellence in physical therapist education: Culture of Excellence, Praxis of Learning, and Organizational Structures and Resources. This perspective proposes a transformative call for reform framed across 3 core categories: (1) creating a culture of excellence, leadership, and partnership, (2) advancing the learning sciences and understanding and enacting the social contract, and (3) implementing organizational imperatives. Similar to the Carnegie studies, this perspective identifies action items (9) that should be initiated immediately in a strategic and systematic way by the major organizational stakeholders in physical therapist education. These recommendations and action items provide a transformative agenda for physical therapist education, and thus the profession, in meeting the changing needs of society through higher levels of excellence.

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There has been no comprehensive study of physical therapist education since the 1960s, when Catherine Worthingham engaged in a multiphase, federally funded study of physical therapist education. Not only did she study physical therapist education, her study spanned several other aspects of the profession, including trends in patient care, the clinical environment, referral patterns in patient care, and graduate outcomes.[1–6]

Worthingham's final paper placed the study findings in a broader context of the then current and future trends in health care and higher education.[6] The landscape of physical therapist education has changed significantly, growing from 42 programs when she started her study (24 in a college or university, 13 in a hospital, 4 in a medical school, and 1 in a physical education school) to today when there are 235 doctor of physical therapy programs.[7] Yet, the profession is faced with issues similar to these that were identified by Worthingham:[6]

- **Professional identity**—If physical therapists are to assume a professional role in relationship to other health professions, including medicine, a closer approach to peer equivalence, mutual respect, and recognition of responsibility is essential.[6(p1321)]
- **Workforce**—The public is demanding that health care, of which physical therapy is an essential part, be available, accessible, and acceptable, yet there are not enough physical therapists to fill budgeted positions.[6(p1321)]
- **Societal needs**—Educators in physical therapy, as in medicine, can no longer shirk the responsibility of meeting community health needs on a local, regional, or national scale.[6(p1322)]

Although the profession has made substantial progress in these areas, the themes still resonate today, as the profession faces the contemporary challenges of:

- Advancing our identity in society as the health care professionals whose expertise is movement[8,9]
- Managing workforce issues as the need for physical therapists continues to outpace the supply[10]
- Striving to meet the Triple Aim of improving the quality of and satisfaction with health care, while also reducing the cost of health care, and improving the health of populations[11]
- Participating with other health care professions to reduce health disparities[12]

Given that there has not been a systematic study of professional education in physical therapy for 50 years and that the complexity and uncertainty in the higher education and health care environments only continue to grow, these authors believe that it is an opportune time to revisit professional and postprofessional physical therapist education. We argue that now is the time for the profession to return to a "Worthingham-like call" for reform in physical therapist education. The recommendations and action items in this paper, generated from Physical Therapist Education in the 21st Century (PTE-21): National Study of Excellence and Innovation for Physical Therapist Education,[13] provide a transformative agenda for physical therapist education, and thus the profession, in meeting the changing needs of society through higher levels of excellence.

Carnegie Studies of Preparation for the Professions

Early in the 21st century, the Carnegie Foundation for the Advancement of Teaching, under the leadership of then Carnegie President Lee Shulman, commissioned a study of 5 professions (medicine, nursing, law, engineering, and clergy) in the Preparation for the Professions Program (PPP).[14–19] These qualitative studies were not meant to assess the quality of individual programs, but rather sought to identify multidimensional characteristics of excellence that could strengthen and transform the preparation of professionals within and across professions.[19] The studies led to dissemination of a series of critical observations about the state of affairs in professional preparation, including a series of key recommendations for reform across education, policy, and practice in each of the disciplines.[19–24] The Carnegie Foundation's work is having its intended outcome. For example, in medical education significant progress has been made on the standardization of learning outcomes and research focused on learner progression through the establishment of entrustable professional activities for entry into residency education.[22–25] In nursing there is continued work on the importance of developing clinical reasoning versus critical thinking and significant movement to require the bachelor's degree for entry into the profession.[22,26,27] We have every reason to believe such transformation is possible for physical therapist professional and postprofessional education.

The Physical Therapist Education for the 21st Century (PTE-21) Study

In 2008, the research team along with representatives from the American Physical Therapy Association (APTA) sought expert consultation from Dr. Lee Shulman and other members of the medical education study at the Carnegie Foundation for the Advancement of Teaching in an effort to design a similar study for physical therapist education. Our findings from this Carnegie-like study are found in "National Study of Excellence and Innovation in Physical Therapist Education: Part 1—Design, Method, and Results."[13] In this second paper, we propose a series of recommendations that draw from our research findings, the Carnegie work, and research in the learning sciences. These recommendations, framed within our conceptual model (Fig.), are a call to action for individuals and all of the organizations involved in physical therapist education. We conclude with 9 critically important action items that we believe leaders in the profession should adopt in order to transform physical therapist education toward excellence.

Analysis Process for Generating Recommendations

The study purpose, design, methods, and results are provided in the companion article.[13] There we described

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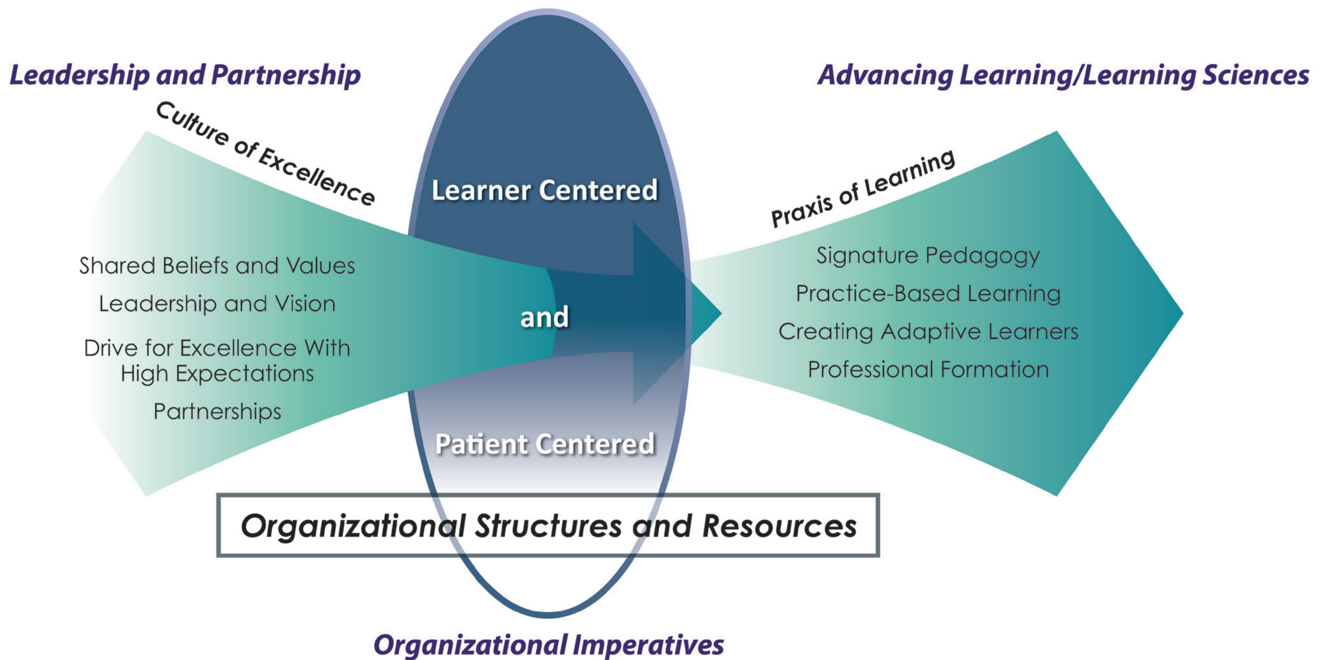

Figure.
Dimensions, elements, and transformational areas for promoting excellence in physical therapist education.

the iterative process of data analysis, interpretation, and verification that led to the conceptual model and our recommendations. We shared the recommendations with key stakeholders for review as part of the verification and refinement process. Those reviewers included informants from each academic and clinical site, our advisory board members, representatives from our funding sources, and external consultants, including researchers at the Carnegie Foundation. We asked reviewers to provide comments or questions about each recommendation and indicate whether they agreed or disagreed with the recommendation. We received strong agreement with all proposed recommendations, and comments that helped us to further refine the document. In 2016 we shared the final findings and these original recommendations at the APTA Combined Sections Meeting.[28] Following that presentation, dissemination via webinars with selected groups (eg, an APTA Clinical Education Task Force) and ongoing frequent discussion and writing by the investigators have led to the current recommendations and action items presented in this article.

The conceptual model of excellence in physical therapist education (Fig.) consists of 3 major dimensions, including 8 elements, and a nexus or 'lens' that integrates culture with learning for practice. The left side of the model presents the dimension *Culture of Excellence* and contains 4 elements that we consider necessary to the pursuit of excellence. The right side of the model presents the dimension *Praxis of Learning*. This dimension includes 4 elements that are essential components of excellence central to learning in physical therapist education. The *nexus* is where there is a critical interdependence of patient centeredness and learner centeredness across these 2 dimensions. The third dimension represents the foundational component of *Organizational Structures and Resources*.[24]

In presenting our call for reform below, we provide our recommendations for each element, based on the findings from Part 1,[13] along with support for these recommendations from relevant literature. This is followed by examples of actions key stakeholder groups could take to accelerate change in physical therapist education.

Call for Reform: Culture of Excellence

This dimension addresses changes needed to achieve a culture that supports excellence in physical therapist education. There are 4 elements in this dimension: shared beliefs and values; shared leadership with a clear vision; a drive for excellence with high expectations, and vital partnerships (Fig.). These elements of excellence were observed during our site visits and resulted in 8 recommendations for physical therapist education.

Shared Beliefs and Values

Clinical programs, in which patient centeredness was foremost, also emphasized learner-centered teaching; and academic environments, in which learner-centered teaching was foremost,

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also framed their teaching in patient-centered care.[13] Recommendations:

1. *Cultivate and make explicit the shared values within the learning community that will create a drive for excellence in education. Do so by strengthening the mutual trust, respect, and collaboration for all members of the community; particularly the learners.*
2. *Demonstrate the dual values of:*
   a. *learner-centered teaching, focusing on the needs, skills and interests of the engaged learner; and*
   b. *patient-centered care, focusing on the needs, interests, and goals of the patient, across all educational venues, whether in academic or clinical settings.*

These recommendations reflect the literature of management sciences and of health care. The culture of an organization has long been known to have a large impact on the ability of the organization to meet its goals.[29] More recent research has confirmed that those organizations characterized by a culture of giving and sharing are more successful on almost all organizational parameters.[30] Patient centeredness has been widely accepted as an important concept in 21st-century health care and has permeated all health professions, including physical therapy.[31–36] Learner-centered education is also a widely adopted concept employed in education at all levels, including health professions education.[37,38] In physical therapy, educational researchers and leaders have repeatedly identified being learner centered as an important element in professional education.[39,40] Given that physical therapist education is where the nexus of learning and practice occurs, educators, practitioners, and learners can create cultures that equally value these 2 concepts.

Leadership and Vision

Our findings show that shared leadership among effective teams was the norm and these teams valued innovation to promote a culture of excellence. In addition, leaders leveraged the institutional mission to advance the profession's goals and responsibilities to society. Leaders were attentive to internal and external forces influencing physical therapist education, practice, and research. These leaders expressed a clear vision and worked to facilitate team-based collaborations toward these greater goals.[13] Recommendations:

3. *Provide leadership for academic and clinical faculties to prepare practitioners who can thrive in a dynamic, rapidly changing health care system that focuses on the health outcomes for individuals and populations through leveraging technology, addressing the social determinants of health, reducing costs, and improving access to care.*
4. *Develop stronger leaders in academic and clinical settings: leaders who share a compelling vision in which practice, education, and research mutually reinforce and advance each of these components of professional preparation.*
5. *Institute leadership development that reinforces the value of shared leadership, effective teams, innovation, and cultures of excellence. This development must begin in professional education and continue across a professional's career.*

Shared leadership is recognized as an essential approach to management across organizations and businesses. Facilitating leadership in others and building diversity of skills across the leadership team are considered essential principles for leadership in all types of organizations.[41–43] This is echoed across the higher education literature as well.[44–°45] Physical therapy education has incorporated this principle in APTA's Education Leadership Institute, designed to prepare physical therapy education leaders.[46] Emerging research in leadership illustrates the importance of sociocultural, complexity, transformational, and relational team theories that deserve attention in leadership development.[44]

Drive for Excellence

Faculty, learners, and clinicians had a thirst for learning, a commitment to excellence through setting of high expectations, and a willingness to hold each other accountable in meeting those high expectations.[13] Recommendation:

6. *Continually innovate and take risks to drive the shared vision for practice and education forward. This means that CAPTE standards should have the flexibility to recognize innovation in physical therapist education. The current CAPTE accreditation program standards also need to better reflect the resources and processes needed to achieve excellence.*

The willingness to take risk has been shown to be a valuable trait for managers across many businesses.[47] Drucker,[48] in an early description of strategic planning, defined it as a process of making risk-taking decisions in an organized fashion, based on a good assessment of the current and future situation, and measuring the outcomes. He stressed that taking risk is essential for innovation and growth of the enterprise.[48] Higher education has focused a great deal on innovation, particularly as a means to solve some of its more pressing problems such as concerns over cost and quality.[49] In physical therapy, the APTA has led the way in disseminating ideas about innovation in practice.[50] APTA and several of its components funded the research that generated these recommendations,[13] with a goal to identify areas for innovation in physical therapist education.

Partnership

Creating a shared vision that values patient-centered care and learner-centered teaching was an essential component of these partnerships. Equally important to these structural partnerships were examples where faculty, clinicians, students, and residents shared and used information to guide student learning in both settings as well as to inform curriculum and teaching and learning in the classroom, laboratory, and clinic.[13] Recommendations:

7. *Create, develop and support fair, creative, and responsible partnerships between academic and clinical organizations in both clinical and*

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classroom teaching: educational programs can't exist in isolation and be excellent.

8. *Move from an uneven model for clinical learning, where there are not true partnerships, to a fully integrated, practice-based learning model with the clinical faculty as full partners with the academic program. The practice-based learning model requires clinical faculty to become full partners in the academic program, and fully integrated clinical learning spaces must be accessible to students and faculty.*

Recent management literature has focused on collaborative work for success in the workplace with the desire to benefit others, including the consideration of others' perspectives, as an antecedent to collaborative behavior.[51–53] Positive interpersonal interaction increases emphasis on collaboration, leading to businesses success,[43,54] including in academic health centers.[55] Similar to our findings about the importance of mutual respect, trust, and a shared vision,[13] the American Association of the Colleges of Nursing identified these core values as cornerstones for academic-practice partnerships and has chosen to feature such collaborations explicitly by giving an annual award for academic-practice partnerships.[56] In physical therapy, while collaboration is identified as one of the guiding principles for the vision for the physical therapy profession adopted by the APTA,[8] there is little work done to demonstrate the application of the principle.

Call for Reform: Praxis of Learning

This dimension includes 4 elements: signature pedagogy, practice-based learning, creating adaptive learners, and professional formation (Fig.). These elements of excellence were observed during our site visits as critical components in the learning environment and led to 14 recommendations for physical therapist education.

Signature Pedagogy

Signature pedagogies highlight distinctive features of teaching and learning in the profession.[57] We observed a dominant and pervasive focus on *the human body as teacher* as a pedagogical strategy employed to foster learning about human movement and meaningful function. This signature pedagogy was evident whether the student was in the anatomy laboratory, learning in the musculoskeletal laboratory from his or her own body, working with a peer or instructor, or working with patients. Recommendations:

9. *Adopt the profession's signature pedagogy, the human body as teacher, as it is foundational to achieve excellence in physical therapist education.*

10. *Require early authentic clinical experiences, which are essential for teaching and learning through our signature pedagogy in the context of practice and make signature pedagogy more evidence-based, explicit, and visible in all learning environments.*

11. *Develop consistent, shared language on the role of movement and what is meant by the movement system that can be implemented across academic and clinical settings. Intentionally integrate socio-cultural factors in improving human movement into all curricula.*

Signature pedagogies, which highlight distinctive features of teaching and learning, have been described in other professions.[18,58,59] For example, bedside teaching was identified as the signature pedagogy in medicine,[18] the Socratic method in law,[15] and coaching for a sense of salience in nursing.[17] The identification of the human body as teacher as our signature pedagogy is consistent with the current strong consensus in the profession on the role of movement in the work of the physical therapist and the focus on more clearly describing and defining the movement system.[8,9]

Practice-Based Learning

We found that faculty and learners were frequently engaged in authentic situated learning experiences where there is guided participation of the learner centered around patients in academic and clinical settings. Having a diverse community of professional and postprofessional learners (students, residents, graduate students, fellows) in both clinical and academic environments was seen as an important addition to the learning environment that provided a unique layering of teachers and learners and fostered opportunities for modeling and reciprocal teaching/learning at multiple levels. Recommendations:

12. *Implement faculty development programs/activities focused on teaching and learning strategies grounded in the learning sciences, as the profession must develop a shared language, understanding of, and competence in the pedagogy of learning for practice. The learning that occurs in the context of practice (situated learning) is powerful and critically important in the development of professionals and should be a central focus of faculty development.*

13. *Develop models of learning environments across academic and clinical settings centered on practice-based learning with clear visibility of active clinical teaching, classroom/lab teaching, research, and practice. The situated learning that is central to practice-based learning needs to be intentionally structured and sequenced and occur early, often, and continuously.*

14. *Require academic programs to participate in residency education, as it provides essential opportunities for interaction, mutual reflection, and reciprocal teaching and learning between professional and postprofessional learners in communities of practice.*

There is a rich body of literature that shows the value of workplace learning across many disciplines and professions[60–62] In addition, there is evidence that early learning for practice creates a scaffold for contextual and continuous learning; learning that sticks.[37] The health professions, rooted as they are in the apprenticeship form of learning, have long been leaders in this

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approach.[63] Clinical education has been a major part of the education of physical therapist education since its inception.[64] However, it is only recently that there has been discussion about the intentional integration of didactic and workplace learning experiences.[39]

Creating Adaptive Learners

While we observed faculty promoting developmental skills, attributes, and dispositions that characterize an adaptive learner, this was often done intuitively, that is, by placing students early on in situations where they can safely struggle with the complexity and uncertainty of practice. They did not all demonstrate a depth of understanding of the underlying pedagogical and critical learning concepts central to developing adaptive learners and further advancing clinical reasoning.

15. *Establish a comprehensive, longitudinal approach for standardization of performance-based learning outcomes across the learner continuum that is grounded in foundational domains of professional competence. These learning outcomes will require development of performance-based assessment measures aligned with standardization of learning outcomes that are integrated and cumulative. Adaptive learners assume responsibility for their learning through openness to feedback, self- and situational awareness grounded in strong self-monitoring skills, and a lifelong commitment to learning.*

16. *Consistent with the profession's commitment to evidence-based practice, teaching and learning also need to be evidence based. The profession needs intentional development of physical therapist educational researchers who can provide such evidence for the profession and address urgent problems of learning in the profession. Researchers need to understand and explore the teaching and learning strategies that prepare adaptive learners who can assume responsibility for their learning through openness to feedback, self- and situational awareness grounded in strong self-monitoring skills, and a lifelong commitment to learning.*

17. *The profession must establish a comprehensive, longitudinal approach for the explicit development of learners' clinical reasoning skills that spans entry-level through clinical residencies and continues across the therapist's career. This comprehensive approach to clinical reasoning will require that academic and clinical faculty develop robust teaching, learning, and assessment strategies.*

The creation of adaptive learners is the focus of much work in higher education.[65] Part of the Accelerating Change in Education project of the American Medical Association focused on development of a conceptual models for curricula and learning to develop master adaptive learners.[66,67] Adaptive learners are engaged in continuous learning, have strong self-monitoring and assessment skills, seek out and embrace feedback, reflect on and learn from their experience, and incorporate new learning to be able to function in complex, uncertain, and novel situations.[66,67] Despite the clear recognition of the need for a structure to frame learner development and attainment of professional competence,[68] there has been limited attention to the development of adaptive learners in physical therapy.[69] A deeper understanding of the core concepts and underlying education research on the development of adaptive learners is essential to the design of innovative and excellent didactic and clinical curricula.[66,67] Learning environments that embrace the discovery and use of evidence from such research facilitates learners' ability to manage decision making in uncertain conditions.[66] The development of students and therapists' clinical reasoning abilities demands well-crafted learning experiences grounded in established teaching and learning strategies.[70,71] Understanding the role of the learning sciences in teaching, learning, and education research is critical for the profession. While physical therapy has been slow to show a serious commitment to education research,[72] recent efforts are underway to address this important need.[69]

Professional Formation

We found strong evidence of a commitment to quality patient-centered care and the critical importance of our moral obligation to place patient and client needs ahead of personal needs. While we observed many instances of community-based activities, most of these were focused on how programs could meet curricular needs, rather than grounded in a deeper understanding of a professional obligation to meet societal needs.

18. *Develop a strong sense of the moral foundations that underpin and are inseparable from practice in all physical therapists so that they demonstrate a full understanding of the meaning of being part of a profession, including their obligations as advocates in organizational and policy arenas for patients, clients, and the health needs of society. Physical therapists must develop the moral courage and ability to respond to substandard practice. The moral dimensions of patient-centered care permeate practice and, thus, must be explicit and deeply embedded in the professional curriculum. There must be faculty who have expertise in the moral foundations of practice and who collaborate with other faculty members to integrate the moral foundation of practice into learning throughout the curriculum.*

19. *Develop the moral courage and ability to respond to substandard practice in all physical therapists. Teaching and learning activities must help physical therapists resist the stresses that can be experienced with meeting these obligations in the reality of practice, and lead to reduction in the level of stress as practice changes to more clearly reflect these obligations. Just as learning in clinical courses must be practice based, so too should the learning experience in these areas be grounded in actual practice, leading to learners who have strong self-monitoring skills and are able to function as moral agents in complex and uncertain situations.*

20. *Act on our individual and collective responsibilities to society, or we*

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jeopardize our status as a profession. Individual therapists and the profession must fully commit to eliminate health disparities, address the social determinants of health, and improve the health care, health, and well-being of our communities and promote the health of populations. The profession must be integral partners within the health care community, public health, community agencies, and governments to achieve this commitment.

21. *Recognize the unique responsibility as academic programs to partner with the community in developing and implementing programs that place positive health outcomes to the community as their primary focus.*

22. *Academic institutions must take a leadership role to create more diverse and inclusive learning and practice environments in order for the profession to have a positive impact on addressing the social determinants of health. Physical therapy programs must recruit and retain faculty and students who represent the racial and ethnic, cultural, and socioeconomic diversity of our country, particularly for people who are from unrepresented minorities in health care and from socioeconomically disadvantaged backgrounds. There must be an active rejection of the assumption that lack of diversity is a problem that cannot be solved. Curricular content, admissions and retention policies, and hiring policies, among other topics, all must be addressed.*

The view that members of the professions have an ethical obligation to their patients and clients *and* that professions have an ethical obligation to society has deep roots.[63,7374] Sullivan's assertion that professional schools are essential portals to professional life permeates the findings and reform recommendations of the Carnegie studies.[15,17–19,63]

The ethical obligations of individual practitioners to their patients has been a continual source of inquiry and focus in the health professions.[75] This focus is also reflected in physical therapy, through the Code of Ethics,[35] Professional Core Values,[36] and the professional literature.[76,77] The professions have paid less attention to their obligations to society as a whole. Sullivan speaks to this quite powerfully as he describes civic professionalization and the obligation of the professions to use their knowledge and skills to help those most in need and address social disparities.[19,63,78–80] Physical therapy's vision, "Transforming society by optimizing movement to improve the human experience,"[8] has the potential for the profession to fulfill that social responsibility.

Call for Reform: Organizational Structures and Resources

The model dimension of Organizational Structures and Resources does not have individual elements; however, this section of 8 recommendations addresses the critical structures and resources (models, academic program size and resources, and clinical education) that are foundational for transformation (Fig.).

Academic Programs

Our findings pointed to the critical ingredient of intentional, early, and continuous learning focused on patient care, rather than a defined model for clinical education. Among the academic sites, we found as many models of how the physical therapist education program was organized within the institution as there were academic sites in our study. There were varied structures for how each of the academic programs was housed within the University. While each structure brought different challenges, the program's leadership was able to provide skilled vision and administrative navigation that facilitated excellent, sustainable, and thriving programs. Recommendations:

23. *Focus attention across the profession on improved graduates' outcomes, the need to reduce the cost of education to students and society, and the acquisition of resources to support physical therapist education if the public's expectations for greater accountability throughout higher education are to be met.*

24. *Stop expending resources of the profession, and of academic and clinical programs, in attempting to identify a narrow set of specific academic organizational structures or curricular models for physical therapist education. Rather, resources should be expended on using sound educational research to identify the best array of options that lead to success with the other characteristics identified here. This would result in academic and clinical education programs that display a diversity of models and organizational structures, all of which have been shown to lead to success in achieving excellence and innovation.*

25. *Create a national data set that includes essential metrics of performance outcomes, structures, and processes that can be used for meaningful research to guide future evidence-based change.*

26. *Assure that academic programs have control of their financial resources, and that they develop economic models for revenue generation through multiple means, eg, tuition, development, grants, or clinical revenues. They must discard beliefs that small class sizes are inherently better and move toward larger programs as one means to increase the range and depth of faculty expertise and other necessary resources.*

27. *Develop strategies so that academic programs become respected, valued partners within their organizations and have influence over their resources.*

There are national and international concerns over the cost of health professions education,[81,82] 3-year medical programs have been introduced,[82] and there are concerns over student indebtedness in physical therapy.[83,84] Developing a national data repository with an adequate infrastructure would enhance the contribution that education research can make to the profession[69,85]

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and provide the type of data necessary to guide structural, system, and curricular changes, as well as many others.

Clinical Education

We found a mission-driven commitment to clinical education founded on a deep commitment to preparing the next generation of physical therapists. The sites used cost-benefit analyses of clinical education that were more qualitative and informal than quantitative and that considered a range of tangible and intangible benefits, such as recruitment, development, and retention. The clinical agencies focused on their overall financial status, but without exception, they did not have evidence suggesting the clinical education program negatively affected their financial performance. Recommendations:

28. *Use reasonable productivity standards in clinical education sites that recognize the contribution of the clinical instructor (CI)/student team to patient care with analysis over relatively longer time frames.*

29. *Include professional and postprofessional education in the missions of clinical education sites. All clinicians at clinical education sites should recognize the need to contribute to clinical education, either by direct teaching, or by supporting the CI/student team.*

30. *Recognize and more clearly articulate the financial and other benefits from clinical education, including savings related to recruitment and retention, and by contributions of students and academic programs to professional development.*

The structure, cost, and quality of clinical education in physical therapy has been the subject of much discussion over the past several years. A Clinical Education Summit was held in 2014 to bring together the clinical education community to discuss these topics in a more formal way. The Summit was preceded by publication of a special issue of the *Journal of Physical Therapy Education*[86] and was followed up by a final report.[87] Several panels have been established to work on principal issues as determined at the Summit. The current panels include Student Readiness, Integrated Clinical Education, and Common Terminology.[88] There is also continued work to understand the economic costs and benefits of clinical education.[89]

Action

In her final paper, Worthingham argued that the profession required (1) a stronger focus on what society needs from the profession, (2) an expanded investigation of the profession, (3) enhanced connections between academic and clinical elements of education, and (4) more teamwork among the health professions.[6] Some fifty years later, Worthingham's findings resonate with several core areas for transformation in our study: partnerships between academic and clinical communities, the need for teamwork and interprofessional collaboration, and a stronger commitment to meeting societal needs through our social contract.

The purpose of our study, like the studies done by the Carnegie Foundation, was not to evaluate educational programs but rather to shine a light on examples of educational excellence and innovation, to highlight what is possible and to contribute to the profession's efforts to transform itself and society. Our recommendations are supported by our observations and thematic elements developed in our model of excellence in physical therapist education, and they lead us to suggestions for immediate action for change. Promoting change across the professional education community is never easy. Common challenges include perceived lack of resources, accreditation or regulatory restrictions, institutional rigidity, and persistent historical divides between academic and practice communities. All members of the educational community and all academic and clinical education facilities should review these recommendations and take responsibility for effecting change within their spheres of influence. But this will not be sufficient to reach the level of transformation that is possible. One strategy used by other professions to accelerate the implementation of recommendations was identification of key stakeholder groups within the profession that could collectively agree to lead the change.[17,23,90] For example, in nursing, 4 partner organizations have collaborated to disseminate and encourage the application of those recommendations. These 4 organizations, the American Association of Colleges of Nurses (AACN), the National Council of State Boards of Nursing, the National League for Nursing, and Sigma Theta Tau, represent the education, licensing, professional, and practitioner communities in nursing.[26] The academic-practice partnership described above is a collaborative venture of the AACN and the American Organization of Nurse Executives.[56] In medicine, graduate and undergraduate organizations have worked with specialty boards to more clearly identify competencies required for practice.[24] In law, the American Bar Association created the Task Force on Legal Education, which worked with state bar associations and the accrediting body in law to integrate recommendations into licensing and accreditation.[91]

For physical therapy, moving these recommendations forward will require collaborative, intentional efforts by leaders throughout the profession, from the academic institutions, clinical organizations, and the professional association, including program directors, clinical administrators, deans, and academic and clinical faculty members. We identify action items that need strategic leadership across key stakeholder groups for implementation. These action items are directly linked to 3 transformational areas, corresponding to the dimensions in our model and are linked to our recommendations. See the Table for details on the links between action items and recommendations. The action items identify the stakeholders who need to be involved to bring these items to reality, including: APTA, the American Board of Physical Therapy Residencies and Fellowship Education (ABPTRFE), the American Board of Physical Therapy Specialties (ABPTS), the Education Section, the American Council of Academic Physical Therapy (ACAPT), and the Commission on Accreditation of Physical Therapy Education (CAPTE).

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Table.
Map of Recommendations to the Action Items

ACTION ITEMS	RECOMMENDATIONS
1. Address the shortage of qualified faculty and of academic leadership	Recommendation 1: Cultivate shared values of excellence, trust, respect, and collaboration. Recommendation 5: Develop shared leadership models that facilitate innovation and excellence. Recommendation 6: Foster innovation and risk taking to drive the shared vision.
2. Create strong, equal academic-practice partnerships that foster excellence	Recommendation 7: Build fair, creative, and responsible partnerships between academic and clinical faculty. Recommendation 8: Make clinical faculty full partners with the academic program. Recommendation 10: Require early authentic clinical experiences that provide for teaching and learning in the context of practice.
3. Infuse the learning sciences into the preparation of academic, clinical, residency, and fellowship faculty	Recommendation 12: Implement faculty development programs grounded in the learning sciences that facilitate an understanding of, and competence in, the pedagogy of learning for and through practice. Recommendation 13: Create learning environments in academic and clinical settings that provide opportunities for situated learning experiences that are intentional, sequenced, and occur frequently across the curriculum. Recommendation 16: Foster opportunities for physical therapist educational researchers to generate an evidence-based approach to teaching and learning.
4. Develop a continuum of professional performance expectations that are grounded in key competencies and support excellence in learner development	Recommendation 14: Require academic programs to participate in residency education to enable reciprocal teaching and learning between professional and postprofessional learners in communities of practice. Recommendation 15: Establish a comprehensive, longitudinal approach for standardization of performance-based learning outcomes grounded in foundational domains of professional competence. Recommendation 25: Create a national data set that includes essential metrics of performance outcomes, structures, and processes to guide future evidence-based change.
5. Focus curriculum content on societal needs for physical therapist practice	Recommendation 2: Demonstrate learner-centered teaching and patient-centered care in all settings. Recommendation 9: Make the profession's signature pedagogy, *the human body as teacher*, visible in all environments and available for further investigation. Recommendation 11: Develop consistent, shared language about the multifactorial movement system that can be used across academic and clinical settings. Recommendation 17: Develop a comprehensive, longitudinal approach to teaching, learning and assessment of clinical reasoning abilities.
6. Devote significant resources to enhance the diversity in the profession	Recommendation 22: Academic institutions must take a leadership role to create more diverse and inclusive learning and practice environments in order for the profession to have a positive impact on addressing the social determinants of health.
7. Educate students to become moral agents as health care practitioners	Recommendation 18: Develop a strong sense of the moral foundations that underpin and are inseparable from practice in all physical therapists so that they develop the moral courage and ability to meet patients' needs. There must be faculty who have expertise in the moral foundations of practice and who collaborate with other faculty members to integrate the moral foundation of practice into learning throughout the curriculum. Recommendation 19: Prepare learners who act as moral agents and exhibit moral courage in addressing substandard practices. Recommendation 20: Act on our individual and collective responsibilities to society, or we jeopardize our status as a profession. Recommendation 21: Recognize the unique responsibility as academic programs to partner with the community in developing and implementing programs that place positive health outcomes to the community as their primary focus.
8. Achieve control of fiscal resources for physical therapist education	Recommendation 3: Develop leaders who can leverage resources to succeed in a rapidly changing health care system. Recommendation 4: Develop strong leaders with a compelling vision. Recommendation 23: Focus attention across the profession on improved graduates' outcomes, the need to reduce the cost of education to students and society, and the acquisition of resources to support physical therapist education. Recommendation 24: Stop expending resources to identify a narrow set of specific academic organizational structures or curricular models for physical therapist education; expend resources to identify the best way to achieve excellence reflected in the findings of this study and recommendations. Recommendation 26: Assure that academic programs have control of their financial resources, and that they develop economic models for revenue generation through multiple means, and move toward larger programs as one means to increase the range and depth of faculty expertise and other necessary resources. Recommendation 27: Develop strategies so that academic programs become respected, valued partners within their organizations and have influence over their resources.
9. Take decisive action to demonstrate and increase the value of clinical education in the profession	Recommendation 28: Use reasonable productivity standards in clinical education sites that recognize the contribution of the CI/student team to patient care with analysis over relatively longer time frames. Recommendation 29: Include professional and postprofessional education in the missions of clinical education sites. All clinicians at clinical education sites should contribute to clinical education. Recommendation 30: Clearly articulate the financial and other benefits from clinical education.

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Transforming Education Through Culture of Excellence, Leadership, and Partnerships

Excellence in physical therapist education cannot be achieved without a clear commitment to identifying paths for people who seek excellence in all their efforts. Leaders within educational programs and in professional organizations must set the tone, and have resources to partner with those who also value excellence (Fig.). Action items are listed below.

1. Address the shortage of qualified faculty and of academic leadership

The culture of excellence in professional education includes a value for innovation and risk taking among faculty and leaders who strive to address many limitations in the higher education environment, including a shortage of faculty. CAPTE, supported by the APTA, the Education Section, and ACAPT, needs to recognize that the shortage of qualified faculty and of academic leadership is placing the academic enterprise at serious risk for mediocrity, if not failure, and this risk requires a hiatus on accrediting new programs. Initial accreditation for new programs and for continued accreditation of programs must demand the depth and breadth of faculty expertise needed to enact this culture of excellence. CAPTE needs to move expeditiously to rigorously apply standards for faculty, and for the program director, emphasizing the ability to lead and act collaboratively. Rigorously applied standards, while they may lead to more negative accreditation decisions, will set a bar that will better assure every program has the required faculty and leadership resources to educate tomorrow's physical therapists. [Linked to Recommendations 1, 5, 6.]

2. Create strong, equal academic-practice partnerships that foster excellence

Academic programs have long relied upon clinical facilities to "take their students" for clinical education opportunities. This pattern does not facilitate the drive for excellence that fair, creative, and responsible partnerships can develop. ACAPT, in collaboration with the Education Section and other relevant Sections of the APTA, and ABPTRFE, needs to develop models that link clinical education, residency and fellowship education, and faculty practice, through equitable and responsible partnerships among the stakeholders in professional and postprofessional education. Effective academic-practice partnerships are a non-negotiable component of excellence. These models need to allow for implementation across the variety of settings in which professional and postprofessional education occurs. These models need to include the necessary infrastructures that can support partnerships between academic and clinical facilities that advance excellence in clinical learning and practice. [Linked to Recommendations 7, 8, 10.]

Transforming Education Through Advancing Learning/Learning Sciences and Through Understanding and Enacting Our Social Contract

The pursuit of a narrow set of specific academic organizational structures or curricular models for physical therapist education is not fruitful for the profession. Our observations of a variety of structures and models, producing excellent physical therapist education, make clear that the more important focus should be on deepening the profession's understanding and implementation of the learning sciences and focus on our social contract for physical therapist education. These action items draw focused attention to the changes that are needed to use the best evidence possible as we prepare students for the present and future challenging context of health care (Fig.). Action items are listed below.

3. Infuse the learning sciences into the preparation of academic, clinical, residency, and fellowship faculty

All learners across the spectrum from professional to postprofessional education and practice will be better served by faculty who enhance their knowledge and understanding of the learning sciences and translate that knowledge into action in all learning environments. The ACAPT, ABPTRFE, and the Education Section must collaborate to identify and create the needed resources to develop a coherent, sequential, and comprehensive approach to faculty development for all these educators. These faculty development programs should focus on (1) inculcating deep understandings of the profession's signature pedagogy, (2) designing teaching and learning strategies that are richly grounded in practice-based learning environments and focus on creating adaptive learners, (3) understanding how to optimize and advance learning in the robust workplace learning environment, and (4) preparing faculty to use the science of effective teaching and learning in academic and clinical education settings. [Linked to Recommendations 12, 13, 16.]

4. Develop a continuum of professional performance expectations that are grounded in key competencies and support excellence in learner development

We observed the strong desire among students and residents to achieve skilled practice and optimal outcomes for their patients. The pursuit of excellence throughout a career in physical therapist practice can best be guided through developmental professional performance benchmarks. The APTA, ABPTRFE, ABPTS, Education Section, and ACAPT should establish a systematic, widely accepted continuum for learners' competence, from preparedness for final clinical experiences, initial entry to practice, completion of residency education, and ongoing professional practice to develop adaptive expertise. A foundational framework for professional performance standards provides a critical structure for education research in the profession. The work being done in medicine that identifies entrustable professional activities founded in acceptable competencies is one pathway toward establishing this continuum that physical therapy can follow.[92] [Linked to Recommendations 14, 15, 25.]

5. Focus curriculum content on societal needs for physical therapist practice

While physical therapists must learn to meet the needs of individual patients,

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they must also learn to meet the needs of populations, particularly more vulnerable communities. The APTA, the Education Section, ACAPT, CAPTE, and the other relevant APTA Sections must work to assure that there are student learning outcomes that are adopted by all physical therapist education programs that address population health, the needs of communities where health disparities exist, the social determinants of health,[93] and needs of an aging population. These entities must also assure that programs have the necessary curricular resources to successfully meet those learning outcomes. These outcomes and resources need to include integration with community-based clinical learning experiences that have, as their primary purpose, improving the health of the community being served. These uniform outcomes and program resource guide could serve as a model for other important student learning outcomes that are important for successful practice. [Linked to Recommendations 2, 9,11, 17.]

6. Devote significant resources to enhance the diversity in the profession

Despite decades of efforts to enhance the diversity in the profession, our outcomes have not achieved the expected changes. The APTA and ACAPT must make a concerted, public, concrete effort to increase the diversity of students and faculty, particularly diversity of race and ethnicity, gender identity and sexual orientation, and disability. This work can build upon work done by ACAPT,[94] supported by APTA policy on underrepresented minority populations in physical therapist education.[95] The profession will benefit from consistent and current data on the members of the profession, including students. The APTA, in cooperation with the Federation of State Boards of Physical Therapy, ACAPT, federal and state agencies, and workforce researchers, needs to establish a robust data source that describes the current workforce (eg, inputs, deployment, outputs) and also identifies the workforce that is required to serve society now and into the future. The needs of an aging population, a more diverse society, and the social determinants of health and health disparities must all be considered. These workforce demands go beyond simple numbers of physical therapists required for the population, but rather must begin to identify the size, quality, and utilization of a workforce that will be required to meet the profession's responsibilities to society. [Linked to Recommendation 22.]

7. Educate students to become moral agents as health care practitioners

Throughout professional and post professional education, learners are challenged with increasingly complex ethical and moral dilemmas. While the skills of critical thinking and the ability to problem solve are important in professional education, society needs health professionals who believe and act from a deeper commitment to their professional role and obligation to society to make a difference as moral agents. The profession requires curricular and learning guidelines and models that fully integrate the moral foundation of the profession into all areas of practice, including policy advocacy and population health practices. APTA, ACAPT, and the Education Section should convene an expert panel to develop these guidelines and the faculty skills that are needed to implement them. [Linked to Recommendations 18, 19, 20, 21.]

Transforming Physical Therapist Education Through Organizational Imperatives

Physical therapist education programs that establish a culture of excellence are those that can identify the important resources and organizational structures needed for success. The means to achieve appropriate resources may vary. However, resources are crucial for leaders to implement the highest standards for faculty and students, and to achieve respect from colleagues related to educational endeavors in the academic and the clinical setting (Fig.). Action items are listed below.

8. Achieve control of fiscal resources for physical therapist education

Physical therapist education programs are located within a variety of administrative structures, some of which provide appropriate control over educational resources, but this is not uniformly the case. CAPTE must strengthen the requirements for control of financial resources by professional programs. ACAPT must develop resources for program directors to guide them in their efforts to garner resources, including publishing standards for equitable revenue sharing models in academia, advocacy, and leadership development, in order to place academic programs on sound financial standing within every academic institution. Although we recognize that physical therapist education programs can be a positive financial resource for academic institutions and that physical therapist education programs can excel in a variety of academic institutions and organizational structures within those institutions, there needs to be a just and equitable allocation of resources and control of those resources by the programs. [Linked to Recommendations 3, 4, 23, 24, 26, 27.]

9. Take decisive action to demonstrate and increase the value of clinical education in the profession

The ability to provide physical therapist students with the clinical education required for successful practice is threatened by real and perceived financial constraints in the health care system and a lack of data to support the value clinical education provides to clinical practices and patient outcomes. The APTA, ACAPT, and the Education Section must invest considerable resources in or make a concerted effort to find funding for demonstration projects and research that illuminate the costs and benefits of clinical education from multiple perspectives. The Clinical Education Summit Report provides examples of potential approaches to innovation and research to guide action on this item.[85] [Linked to Recommendations 28, 29, 30.]

Conclusion

Implementing the action items and recommendations presented here will require collaborative, intentional efforts

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by leaders throughout the profession, from the academic institutions, clinical organizations, and the professional association, including program directors, clinical administrators, deans, and academic and clinical faculty members. Too often the professional organizations do not collaborate successfully and innovation is limited. The profession will be better served if all collaborators are willing to accelerate the pace of transformation of physical therapist education. We believe that these actions by the professional community are essential, not only to successfully implement the recommendations that we advance, but to transform physical therapist education toward excellence and to improve the health of our communities.

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