

ABSTRACT

COVINGTON, JEFFREY KYLE. Developing a Professional Embodiment of Movement: A Situational Analysis of Physical Therapist Clinical Instructors' Facilitation of Students' Emerging Integration of Movement in Practice. (Under the direction of Dr. Susan J. Barcinas.)

Physical therapists are healthcare practitioners who improve the functional ability of their patients after the effects of injury and disease. One unique component of their practice is the ability to use the movement of their body to affect change as they work with their patient. This ability has been recognized as a uniquely embodied attribute of expert physical therapists. The purpose of this qualitative situational analysis study is to examine how the process of integrating movement into practice begins as physical therapist clinical instructors perceive and facilitate their students' emerging integration of movement in practice. Participants in the study included five physical therapist clinical instructors and their respective five physical therapist students. Data were collected during the students' clinical internships using participant interviews, observation, and document analysis. Data collection and analysis was guided by Dall'Alba's theoretical framework for understanding professional ways of being. Data was analyzed using coding and mapping strategies consistent with Clarke's situational analysis techniques. Findings suggest that in order to develop students' use of movement in practice instructors must: establish a learning environment supportive of students' unique needs; be intentional when teaching students to use movement in practice; and play a vital role in establishing a foundation for students' trajectory of movement-related professional growth. Five themes also emerged from the data describing the ways in which instructors perceive and facilitate students' development through the instructors' abilities to adapt, prepare, enhance, connect, and develop. This study marks the first description of how

physical therapist clinical instructors develop students' use of movement in practice and how they play a role in students' continued professional development.

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Developing a Professional Embodiment of Movement: A Situational Analysis
of Physical Therapist Clinical Instructors' Facilitation of Students'
Emerging Integration of Movement in Practice

by
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DEDICATION

To Suzanne, Claire, and Graham

who fill my life with

love, laughter, and happiness.

BIOGRAPHY

Kyle Covington was born and raised in Mebane, North Carolina on his family's dairy farm. As a child he was always inquisitive and eager to find answers to his many questions. After being involved in a farming accident in high school, Kyle discovered his interest in healthcare and rehabilitation and became eager to help those with neurologic injuries by becoming a physical therapist.

He received his Bachelor of Science degree in Health and Exercise Science from Wake Forest University in 2001, and his Doctor of Physical Therapy degree from Duke University in 2004. While studying to become a physical therapist, Kyle became interested in how health professional students learn. In 2007, he became a board certified neurologic physical therapy specialist. After joining Duke's Doctor of Physical Therapy faculty in 2007 he quickly became even more passionate about educational pedagogy, assessment, and evaluation. This, combined with his interest in how physical therapists developed expertise in using their own hands and bodies to treat patients, influenced his dissertation work.

In addition to his professional work and study, Kyle is the proud father of two wonderful children, Claire and Graham, and husband of Suzanne Covington. He is a dedicated and faithful member of Saint Andrews Presbyterian Church in Raleigh, North Carolina, where he is involved in music, children's, and youth ministries.

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CHAPTER ONE

INTRODUCTION

Background and History

Physical therapists have been described as healthcare providers who understand human movement and use it to restore the physical function of their patients after the effects of disease and injury have made their impact (American Physical Therapy Association, [APTA], 1997). Physical therapists are involved in evaluating and treating problems related to human body systems which play key roles in the ability to move the human body (APTA, 1997). The movement system has been identified as the system of the body of which physical therapists possess unique knowledge compared to colleagues in other health professions (Sahrmann, 1998).

Physical therapists' knowledge of the body's movement functions has been key in the profession's approach to treatment and care of their patients (APTA, 1997). To the physical therapist, movement is not only an action that physical therapists observe and analyze, movement is also a key component of how physical therapists practice. It has been noted that physical therapists use the movement of their own bodies to effect change in their patients' rehabilitation. Since its inception, Physical Therapy has persistently focused on assisting patients to overcome physical deficits by using hand and body movement (Gwyer, Odom, & Gandy, 2003; Murphy, 1995). The acquisition of such skill begins in entry-level physical therapist education programs (Commission on Accreditation in Physical Therapy Education [CAPTE], 2011). Post-graduate programs continue to focus on using the

therapist's own movement as a mechanism for patient evaluation and treatment through professional residency and training programs as well as continuing education (APTA, 2007; 2013a).

For the purpose of this research, movement is defined as the use of the therapist's own hands or body, including their positioning and action, to assess, examine, or effect change in their patient. Physical therapists use their hands and bodies in an infinite number of ways, for example, to strengthen muscle, correct alignment, provide safety, awaken inactivity, or reduce pain, in their patients. This use of movement in the practice of physical therapy has been recognized as an important aspect of high-level patient care. Researchers found that use of movement, among other factors, was an integral component of expert practice among physical therapists. (Jensen, Gwyer, Hack, & Shepard, 2007). These researchers note that expert physical therapists not only understand the movement of their patients, but also utilize their own body's movement when caring for the needs of their clients. Developing the skillful use of one's own body undoubtedly begins with students of physical therapy programs and culminates in the expert therapists described above. However despite the profession's history of recognizing the importance of movement in its practice, little is known about how this aspect of expert physical therapist practice develops.

Statement of the Problem

Though there is an emphasis in Doctor of Physical Therapy (DPT) entry-level curricula on movement science and movement analysis, few programs require assessment of students' use of movement in practice (CAPTE, 2011). Despite a lack of requirements for

assessing movement use in practice, during physical therapist education, students are evaluated routinely on their performance while treating and evaluating patients. During practical examinations and clinical education internships, the student's own body positions, movement, efficiency and effectiveness are routinely assessed. However, very little literature exists to codify how physical therapist faculty and clinical instructors affect change in students' use of movement in their practice. For example, the Clinical Performance Instrument (CPI) is an 18-item scoring tool used nationally to assess student performance during internships (APTA, 2006c). Despite the prevailing sentiment among the profession that physical therapists make effective use of their own movement in practice, there is no required assessment of students' use of movement in the CPI. Therefore it remains unclear how instructors promote the use of movement as a vital component of student practice.

Understanding how clinical instructors perceive the use of movement in their students is crucial. Examining and understanding the process by which clinical instructors perceive their students' use of movement as practitioners could lead to recommendations that promote assessment and instruction of this important component of expert physical therapist practice. As identified by Jensen, Gwyer, Shephard and Hack (2000), the unique use of movement in practice is a hallmark of expertise.

In addition to understanding clinical educators' perception of use of student movement, understanding how clinical physical therapy instructors facilitate the use of movement by students may help us better understand how expertise is developed. In addition we may gain an expanded understanding of how young professionals begin to embody

crucial aspects of the profession, such as the use of movement, through their work. In order to inform the profession's body of educational literature, this study focuses on understanding the experiences of physical therapist clinical instructors as they perceive and facilitate the needs of their students while learning to use movement in practice.

Purpose and Guiding Research Question

The purpose of this study is to examine how physical therapist clinical instructors perceive and facilitate the student process of learning to use movement in practice. Physical therapists practice in many different professional environments, with different aged patients, and often focus their practice on specific specialty areas, each of which utilizes movement in different ways (APTA, 2015d). Integrating movement into practice is a process that begins for every physical therapist during his or her professional educational program. This process continues after graduation and licensure as physical therapists make varied, individualized choices about the types of environments in which they choose to practice. Ultimately the physical therapist may achieve expertise, including the use of movement tailored to the needs of his or her specialty practice area (Jensen et al., 2007). The pathway towards expertise begins during students' professional training, but little is known about how students begin to learn to integrate movement use in their emerging practice.

This study is guided by its primary research question:

How do physical therapist clinical instructors perceive and subsequently facilitate students' development of the use of movement during clinical practice?

Theoretical Framework

In her proposed framework for understanding professional development, Dall'Alba (2009a, 2009b) posits that development cannot be understood solely as an accumulation of skills and knowledge over time.

Learning to become professionals entails integrating what aspiring professionals know and can do with who they are (becoming), including the challenge, risk, commitment, and resistance that are involved. In other words, learning professional ways of being occurs through integration of knowing, acting, and being the professionals in question (Dall'Alba, 2009a, p. 43).

This accumulation must be combined with an escalating embodiment of the essential components of the given profession. In addition, Dall'Alba's (2009a, 2009b) model recognizes that there are multiple pathways along which a professional may travel during his or her journey of professional development and embodiment. This pathway is influenced, at least in part, by how the professional encounters the uncertainty inherent in professional practice, which Dall'Alba describes through common ambiguities faced by developing professionals.

I argue that in physical therapy, an essential component of practice necessary for the development of expertise is an embodied use of movement in practice. Based on the work of Dall'Alba (2009a, 2009b), I suggest that in order to achieve expertise in physical therapy, one must integrate his or her knowledge about movement and skillful use of movement into who they are becoming as an expert movement professional. This framework overcomes the

division that is often created between the epistemological accumulation of skills and knowledge and an ontological understanding of what it means to embody a component of one's practice (Adams, Daly, Mann, & Dall'Alba, 2011).

The process of becoming a movement professional may be achieved in a variety of ways, but these pathways are influenced by the ambiguous “challenge, risk, commitment, and resistance” (Dall’Alba, 2009a, p. 42) the physical therapist encounters in education and clinical practice. The peak of such ambiguity may occur as a novice physical therapist attempts to integrate the use of this essential component of practice as an emerging professional. By recognizing how physical therapist clinical instructors facilitate student learning as they wrestle with the ambiguities of using movement early in their practice, we can better understand how movement becomes an embodied aspect of practice throughout their development. The concepts of professional ways of being are useful in this study as a framework for analyzing the perceptions and actions of clinical instructors working with their students early in practice. Additionally, this framework is ideally suited to begin a research trajectory to determine the pathways physical therapists negotiate between novice practice and expertise as they embody movement in their professional development.

Research Methodology

This study focuses on physical therapy clinical instructors’ experiences as they facilitate student use of movement in practice. A qualitative research methodology is utilized to understand the experiences of clinical instructors. The relationship between the clinical instructor and physical therapist student constitutes an environment in which multiple

influences, internal and external to the student and instructor, are at play. Qualitative situational analysis allowed me to examine the multiple influences surrounding the complex environment of study as grounded theory was used to generate new theoretical information about the research question (Clarke, 2005). Situational analysis also assumes the researcher has his or her own level of knowledge and thereby informs the research process through careful, but intentional, data collection and analysis (Clarke, 2005). In the case of this study, I utilized my experience as a physical therapist and an educator to mold how I designed, collected and analyzed the data. It is therefore crucial to carefully consider my subjectivity and positionality in the research process.

Subjectivity

The various facets of my life shape my role as a researcher. I am an avid learner, a physical therapist, an educator, and a husband and father. Though these aspects of my life may seem divergent, they are inextricably linked to form the person I am. Throughout my life I have been committed to learning and investigating the world around me. I have always found the greatest joy in curiosity, discovery, and reflection. Both in formal educational settings, as well as in everyday interactions, I tirelessly ponder the question “why?” in an effort to learn and understand more about the world in which I live. I believe we learn the most when we stop to ask difficult questions, pause to understand the variable answers that may exist to those questions, and reflect on how to act with that new, and sometimes conflicting, knowledge.

My constant nature to inquire led me to my first profession as a physical therapist. Through examination of the human mind and body, I found a profession that allows me to promote the health and wellbeing of society while exploring my constant curiosity. Acting as a champion for someone else's health can only be successful when you are able to consider the individuality of your patient and his or her unique circumstances. Careful questioning, examination, and reflection are needed to understand the influences of disease and dysfunction and how it uniquely affects each patient. I believe that true healthcare professionals can provide the best care only when they are able to pause to inquire about the true individuality of each patient.

My persistent efforts to inquire and learn led to my interest in academia and physical therapy professional education. I have learned the most by teaching others. I believe we learn best in a committed community where we can build our own set of knowledge from the collective experiences of the learners around us. I also believe that the role of the educator is to facilitate learning in a community. I strive for my classroom to be a place that accepts differences of opinion, values the uniqueness of each learner, and appreciates that variability can exist within any given "*truth*". Most of all, I believe that the community learns most when the teacher is committed to learning along with the students.

Finally, I am a husband and father. This aspect of my life has taught me the most about being a learner, a physical therapist, and an educator. Through my children, I have grown to believe in the importance of reflection and patience to enable effective learning. I have learned that the most enlightening answers may come from very simple questions. I

have learned that improvement only occurs after countless attempts and failures. Most importantly, I have learned that true value in human life is paramount.

As a learner, physical therapist, educator, and father my role as a researcher is grounded in my belief that inquiry is the path to understanding more about the world around you. I believe that through this inquiry, time and space must be provided to allow individual opinions and truths to emerge. I believe these truths emerge best in a community that can rely on each other and progress in knowledge together.

Because of these beliefs, I want to know more about how we educate physical therapists and how the members of my profession develop during their careers. I know that my physical therapist colleagues strive to learn more: more about their patients, more about their practice, more about how their colleagues think and move, and more about themselves. I see this sense of deep reflection and inquiry in the best of my professional colleagues. It is this shared interest in inquiry and self-development that has born my interest in understanding how the newest members of our profession begin their journey to understanding the profession and become a physical therapist. Only through engaging in discourse with fellow practitioners can our professional community begin to understand the truths that give rise to an embodied use of movement in practice throughout a career trajectory.

Positionality

My positionality as a researcher is crucial within the context of this study. This research seeks to better understand how physical therapist clinical instructors perceive and

facilitate their students' use of movement. As a physical therapist, I understand what it means and what it feels like to move my body to effect change and improve the health of my patients. I have literally felt another's joy through my body when a patient finally walked with a normal gait pattern after weeks and months of immobility. Conversely, I have inadvertently induced pain in another person as a product of my own movement.

I am able to reflect on how my ability to use the movement of my body has changed throughout my career. I can remember the awkwardness I felt as a student when asked by teachers to move a patient from his or her hospital bed to a wheelchair and make that movement therapeutic. I remember the frustration in my first year of practice that a patient's progress might be hindered by my inability to move my body in the best way possible to help them. I now can work with a patient for an entire treatment without having to explicitly think about how to move my body in order to reach the desired goal of our session.

I recognized early in my career that physical therapists practiced differently from one another. As a student I recognized that some instructors were concerned only about how I performed skills and demonstrated my knowledge. Some were concerned about the process of my becoming a professional. Some taught me how to perform treatments, while other instructors instilled in me a deep understanding and commitment to effect change in my patients through movement of my body as directed by my clinical reasoning.

Now I am able to consider how my career has developed around changes in my ability to use movement in my practice. In addition, I can now see how the differences I experienced in mentoring and teaching have formed me as a professional. With more

knowledge about how to move my body, I was able to achieve better outcomes with my patients. With increased automaticity of my movement, I increased my efficiency in patient care. With better skill and precision in my movement, my confidence as a therapist improved and therein my patients' confidence in me increased. As my mentors taught me how to be a physical therapist, the skills and knowledge I acquired through study and practice meant more and became more useful to me. What I have been unable to fully reflect on is how my mentors assessed my ability to use movement and to form it into my professional being as a new and developing physical therapist.

Self-inquiry and reflection on these experiences have led to my curiosity about the methods physical therapists employ to teach developing professionals how to use movement in their emerging practice. I fully realize that the experiences discussed above are my own. Though I cannot assume other professionals share my experiences, my own experiences provide the ability to connect with and explore the experiences of similar practitioners. My position and first-hand knowledge of the profession afford me the ability to optimally examine the data. In addition, my positionality allows me to build rapport with my participants and best interpret their stories.

My subjectivity and positionality place me in an ideal position to inquire, examine, and reflect on the experiences of physical therapists as they relate to the use of movement in their practice. I have similar experiences to my participants; thus I am well suited to understand, examine, and interpret the data collected in this study and apply it to the body of existing and emerging literature. Situational analysis provides the opportunity for the

researcher to recognize his or her own experiences and bring those to the data collection and analysis process. By recognizing and accepting my subjectivity and positionality, I am well prepared to utilize my own experiences in the research process thereby producing sound new knowledge that will benefit the profession of physical therapy.

Significance of the Study

The physical therapy profession recognizes the importance of understanding and using movement during our interactions with those seeking our services. It is vital that we better understand how this key aspect of practice becomes integrated throughout the professional development trajectory of physical therapists. Since the use of movement has been recognized as a key attribute of physical therapy experts by Jensen et al. (2007), a next step in understanding how clinicians develop this aspect of expert practice is to examine the beginning formation of movement in practice. Once we better understand how students are guided to embody the use of movement in their professional work, the profession can begin to better understand how this process evolves between novice and expert levels of practice.

This study may lead to further research to examine ways in which physical therapists learn to embody their use of movement in practice along multiple and varied pathways of professional development. Findings from this study and subsequent research have very practical implications for the profession of physical therapy. First, with a better understanding of how clinical instructors perceive and facilitate students' use of movement in practice, we can work to develop a common language of movement use description, something that is currently lacking in the profession. Second, if we know how clinical

instructors perceive and facilitate students' movement, then academic programs can better prepare students prior to the clinical internships to meet the expectations and demands of their clinical instructors. Finally, once we understand how novice clinicians are facilitated to use movement in practice, we can design post-professional continuing education and mentoring programs that will continue to develop an embodied use of movement in practice leading towards expertise.

Summary

This study examines how physical therapist clinical instructors perceive and facilitate their students' use of movement in practice. The use of movement is recognized as an important component of physical therapy and is a vital aspect of expert practice. Increased understanding of how early professionals are guided to integrate movement into their practice will help the profession realize how to guide its members along the multiple trajectories of professional development that may exist. Using the theoretical concepts of Dall'Alba's (2009a, 2009b) professional ways of being in a situational analysis study, I examine the initiation of this process as instructors begin to effect change in their novice student practitioners.

Chapter Two provides a comprehensive literature review of the information pertinent to this study. The literature reviewed has been intentionally selected with the methodological framework in mind. Situational analyses demand that the researcher understand the important contexts surrounding the subject focus. Therefore, the literature review provides the necessary information to ensure this context is understood. A description of

contemporary physical therapist practice is provided. Guiding principles of the profession are discussed, and a brief history of the profession and its educational methodology is provided to offer the reader context for the profession and its members. Next a review of the literature pertaining to clinical reasoning is explored in an effort to familiarize the reader with decision-making strategies used by healthcare professionals, and specifically physical therapists. Expertise is defined and a discussion of how expertise develops is provided. Next a review of literature related to learning the use of movement is provided. Finally a detailed description of Dall'Alba's (2009a, 2009b) professional ways of being is offered.

In Chapter Three a detailed description of the research process is presented. I then return to a discussion of Dall'Alba's (2009a, 2009b) theoretical framework in the context of my study. A discussion of qualitative research is provided followed by a detailed analysis of grounded theory research and situational analysis. Next I discuss the design of the study, including participant selection and sampling, data collection strategies and analysis methods. Next I offer explanations of how I will ensure credibility and dependability within my study. I provide a discussion of strengths and weaknesses in this research study along with a statement of ethical adherence. Finally, I conclude with the timeline of my research project.

In Chapter Four, I present a detailed description of the situational analysis mapping strategies used to analyze the participant data. Three situational maps, seven positional maps, and one social worlds/areas map are presented to analyze the discourse encountered throughout the data collection process. Chapter Five includes a discussion of the themes revealed and the important findings from the situational analysis presented in Chapter Four.

Finally, Chapter Six discusses implications for research and practice pertinent to the findings of this study.

CHAPTER TWO

LITERATURE REVIEW

An elderly woman struggles to coordinate her right arm and hand because of a recent stroke. Her physical therapist places his hands on her shoulder and forearm muscles, giving targeted pressure toward the hand, allowing the patient to sense stability and improve her coordination.

A small child who has lived with deformity her entire life, is struggling to walk at the age of six. A physical therapist, with one hand on each leg and an arm around the child's trunk, moves the small legs in sequence so the child's nervous system can learn a normal gait pattern.

An elite athlete, injured in last week's game, struggles to recover motion in his neck after a blow from an opposing player. His physical therapist strategically presses her hands against the side of his neck; to glide his vertebrae into an ideal position allowing increased range of motion and reduced pain.

A man in the intensive care unit, the day after his open-heart surgery, is motivated to return home and wants to walk to the bathroom. His physical therapist carefully rolls him to his side, leverages her own bodyweight against his to lift him to sitting, then, deftly touches his back and leg in specific places to cue his muscles and assist him to stand.

Contemporary Physical Therapist Practice

The patients described above are indicative of the over 750,000 United States citizens who are cared for by physical therapists each day (APTA, 2015i). Physical therapists are trained to “diagnose and manage movement dysfunction and enhance physical and functional abilities” (APTA, 2015h). Those abilities are enhanced through physical therapists’ skilled use of their own hands and bodies. As described above, it is the movement of the physical therapist’s body that is often responsible for the increased functional ability of the patient. Physical therapists help their clients prevent injury and restore mobility by focusing on impairments of the musculoskeletal, neuromuscular, cardiopulmonary, and/or integumentary

systems of the human body (APTA, 1997; 2015i). They practice in a variety of settings including private practices, acute care hospitals, schools, rehab facilities, skilled nursing facilities, and occupational or industrial settings (APTA, 2015i).

The American Physical Therapy Association, which represents the profession nationally, reports that as of 2013 its members were 69.9% female, 91.7% Caucasian, with a mean age of 44.1 years and on average have been practicing for 18.4 years (APTA, 2015d). Though only about 30% of licensed physical therapists are members of the association, these demographics are likely representative of the profession as a whole. Nationwide, the median income of physical therapists is \$80,000; however, this is significantly influenced by geography, years of experience, practice setting, and degree of education (APTA, 2015i).

Currently there are over 198,000 physical therapists licensed to practice in the United States (APTA, 2015b). Because of the aging population nationwide, the growing demand for primary care services, and the increased life expectancy, the US Bureau of Labor and Statistics expects a 30% increase in the demand for physical therapists by the year 2020 (Bureau of Labor Statistics, 2012). In addition, the healthcare practice environment is changing dramatically in the United States today. Political, social, and economic reforms have motivated changes that will influence the various professions that work in the healthcare arena.

Today the profession sees itself as playing a key role in the future of the country's healthcare as evidenced by its vision statement: "Transforming society by optimizing movement to improve the human experience" (APTA, 2013, p. 318). This vision is shaped

by the profession's history, its educational strategies, the methods by which it prepares graduates through clinical education, and by the ways in which the profession's members develop clinically and professionally on paths towards expertise. To best understand and appreciate what it means to be a physical therapist, it is vital to understand how the profession's history has shaped contemporary practice and how the physical therapist of today strives to continue to develop and change to meet the needs of society into the future.

Guiding Principles of the Profession

The American Women's Physical Therapeutic Association, precursor to the American Physiotherapy Association, and ultimately the APTA, was founded in 1921 by a group of 30 dedicated women (Moffat, 2003). The association's first president, Mary McMillan, set the tone for the philosophical underpinnings of the profession when, in her inaugural message to the membership she stated, "It is up to you and me to see that our foundation is laid on sound principles that will endure" (Murphy, 1995, p. 76). From that point on, the association found ways to challenge its members, ensuring practice and professional endeavors were guided by clear and powerful documents.

Code of Ethics

The profession's first Code of Ethics, provided by the American Physiotherapy Association in 1935, included only four categories: Professional Practice, Advertising, Behavior, and Discipline (Swisher & Hiller, 2010). In the Thirty-First Mary McMillan Lecture, Ruth Purtilo (2000) outlined the three identities of ethical development in physical therapy. She noted the Ethical Self-Identity of 1935, the Patient-Focused Identity of the

1950s, and the Societal Identity, evolving into the future. Each of these different periods mirrored, as Purtilo (2000) described, the profession's changing focus from inward formation to outward partnerships nested in societal priorities. Most recently, the 2009 revision to the APTA's Code of Ethics adopted in 1973 addresses eight different standards of ethical behavior (Swisher & Hiller, 2010). The definitions of these standards encompass all three of the ethical identities described by Purtilo (2000).

In addition to adoption of a revised Code of Ethics, the early twenty-first century ushered in an increased production of guiding documents that altered the practice philosophy of the profession. During the last twenty years, "the profession has defined its scope of practice, secured direct access in most state jurisdictions and articulated a vision of physical therapists as doctorally educated and evidence-based professionals" (Swisher & Hiller, 2010, p. 808).

Core Values

In 2004 the association adopted the position *Professionalism in Physical Therapy: Core Values* that "define the critical elements of professionalism in physical therapy" (APTA, 2012b). These guiding principles of professional practice are defined as accountability, altruism, compassion/caring, excellence, integrity, professional duty, and social responsibility. Physical therapists are urged to embody these values as overarching principles in their practice.

Professional Vision

A notable step in defining the future of the profession was taken in 2000 when the APTA adopted *Vision 2020*. The association's bold vision urged the profession by the year 2020 to achieve a level of practice that included autonomy, direct access to services for patients free from physician referral, doctorally prepared professionals, evidence-based practice, recognition by the public as practitioners of choice for movement dysfunction, and finally, the APTA urged consistent demonstration of the core values of professionalism by all physical therapists (APTA, 2012c). In 2011 the APTA House of Delegates charged the association to begin to look further into the future to set a standard for future practice. "The new vision captures the vital importance of movement to quality of life for all people, and illustrates how the physical therapy profession services society" (APTA, 2015g). In 2013, the APTA House of Delegates approved the new "Vision Statement for the Physical Therapy Profession" and demonstrated its strong outward commitment to society when it declared its intention of "[t]ransforming society by optimizing movement to improve the human experience" (APTA, 2013, p. 318). "The Guiding Principles to Achieve the Vision" go on to describe how "movement is a key to optimal living and quality of life for all people that extends beyond health to every person's ability to participate in and contribute to society." These principles further describe the profession's external commitment to society by defining its professional identity as being linked to the care of the human body's "movement system" (APTA, 2013, p. 321).

History of the Physical Therapy Profession

The outward interest in improving the human experience, as described in the profession's vision statement above, has strong roots in the early historical formation of the field. The emerging concerns of the poliomyelitis outbreaks of the late 19th and early 20th century combined with the devastating effects of war injuries to men returning from battle in World War I necessitated a new type of professional who was knowledgeable about how to help those with physical injury and deformity. Prior to World War I, most United States citizens with physical deformity were kept out of the public eye and received little structured assistance from a federal level (Murphy, 1995, p. 40). "...World War I proved a powerful force in educating the American public about the social aspects of disease and disability" (Murphy, 1995, p. 41). Federal organizations began to recognize the need to provide restorative care to wounded veterans. The US Army's divisions of Orthopedic Surgery and Physical Reconstruction implemented plans that relied on those prepared in physical education to fill the role of "Reconstruction Aides" providing "exercise programs, hydrotherapy, and other modalities, and massage" (Moffat, 2003, p. 16) to wounded veterans. By the end of the war, hospitals throughout the country providing care to wounded veterans employed more than 700 Reconstruction Aides (Moffat, 2003, p.16).

The effects of the World and Korean Wars along with the widespread outbreaks of poliomyelitis and the federal passage of the nation's Medicare and Medicaid programs necessitated an ever-growing profession. In the late 1960s the profession recognized the need for additional professional support to meet the increasing demands of practice. The

APTA's House of Delegates recognized this need and adopted a policy creating the Physical Therapist Assistant (Nieland & Harris, 2003). Also, during the 1970s the membership of APTA in response to the increasing amount of medical technology and knowledge, mounted pressure to follow the lead of other health professions who "by desire or by practical necessity...were being drawn into specialization (Murphy, 1995, p. 198). By the mid-1970s there were more than 12 special interest sections in the APTA's organization.

Historical Foundations of Education in the Profession

The precursors to the formal education of physical therapists can be found in physical education programs of Normal Schools during the late 19th and early 20th centuries. The women who graduated from these programs were well suited to provide exercise programs for the patients of physicians who sought assistance to address the needs of those with scoliosis, poor posture, and poliomyelitis. Initially seven formalized programs were granted funding by the United States Army to train their Reconstruction Aides. In order to enroll they were required to be unmarried women, at least 25 years of age, with some previous training in aspects of health education (Echternach, J., 2003; Littell & Johnson, 2003; Murphy, 1995; Nieland & Harris, 2003).

Soon it became clear that further delineation in the education of physical therapists was needed.

Having come to the conclusion that a physical therapy technician was something beyond a physical educator (or a nurse) with an inclination toward work in a medical setting and some specialized training, physical therapy was faced with the necessity

of identifying what constituted that additional and unique education or training process. (Littell & Johnson, 2003, p. 4)

The professional association identified five programs that were viewed to delineate the training requisites needed for the emerging practice of physical therapy. These five schools represented a mixture of former Reconstruction aide training programs and hospital based training programs. All of these programs included course work in foundational sciences, clinical sciences, use of physical agents and medical management (Littell & Johnson, 2003, Table 1). Though there is now less of an emphasis on physical agents and an increased emphasis on evidenced-based practice, these subjects continue to be the foundational categories of study found in physical therapy programs today (APTA, 2004; CAPTE, 2011).

A Doctoring Profession

In 1940, 39 educational programs for physical therapy were in existence. Through this decade there was great variability in the types of educational settings that housed physical therapy education programs. By the 1950s, it was the prevailing opinion of the association that education programs be associated solely with institutions of higher education. Despite the move to college and university settings, many programs continued to award a certificate instead of the baccalaureate degree. In 1960, APTA provided a resolution setting the baccalaureate degree as the minimum standard for practice. Interestingly, this did not require that the educational programs had to grant that degree. The resolution simply required that to practice one must hold a baccalaureate degree, thus still allowing the certificate programs to persist (Littell & Johnson, 2003; Murphy, 1995).

Notably, the APTA's positions on preferred degree did not set an upper limit for educational programs. Three graduate degree programs existed in the 1960s, and by the end of the 1970s eight master's level programs were in existence (Littell & Johnson, 2003). Recognizing the changing landscape of professional practice in healthcare at the time and the expanding knowledge needed to practice, the APTA under President Robert Bartlett's leadership resolved to require the post-baccalaureate degree as the minimal standard. In 1979, the APTA House of Delegates adopted such a policy and gave the profession 11 years to attain this level of training (Murphy, 1995). Once again, the policy did not stipulate an upper limit to degree offerings. Despite the position of the association, there remained some who were wary about the change in degree, what it could mean to applicant pools, enrollment numbers, strain on the already small faculty pool, and possible implication on higher education finance (Caston, 1982).

History would repeat itself when only five years later, Geneva Johnson, during the Twentieth Mary McMillan Lecture stated, "Changes in education are the key to full professional status" (1985, p. 1694). She went on to state, "I expect us to develop the professional doctorate in physical therapy as a standard for entry-level education within the next five years" (1985, p. 1694). Though not without controversy (Rothstein, 1998a; Rothstein, 1998b), and strengthened by the stance of *Vision 2020* (APTA, 2012c) the Commission on Accreditation in Physical Therapy Education decided in 2010 that by 2015 all programs must grant the doctor of physical therapy (DPT) degree in order to receive accreditation (CAPTE, 2011). In 2013, 238 of the 239 accredited physical therapist

education programs were awarding the DPT degree (CAPTE, 2014), reflecting the prevailing opinion in the profession that the doctoral level of education is most appropriate to prepare effective clinicians in today's healthcare environment. With this level of training comes additional societal expectations including the ability to train and practice in a highly specialized manner, and that each practitioner, generalist or specialist will engage in a process of continual life-long learning in order to provide best care to society.

The shift in degrees over the profession's history has helped maintain a robust and qualified cohort of interested applicants for entry into physical therapist educational programs. Today, demographic data of those seeking to enter physical therapy educational programs is reflective of the practicing profession as a whole. In 2012, over 13,000 applicants participated in the national application process, and 50.8% of those were offered admission to a physical therapist education program (Physical Therapist Centralized Application Service [PTCAS], 2012, p. 2-7). Of those accepted to an educational program, 64.8% were female with an average age of 23.62 years (PTCAS, 2012, p. 9), and 71.58% of accepted applicants self-identified as "white of non-Hispanic origin"; however, these statistics also indicate that over 12% of the pool declined to indicate race (PTCAS, 2012, p. 15). The three most prevalent undergraduate majors of those entering in the 2012 matriculate pool were exercise science, biology, or kinesiology (PTCAS, 2012, p. 31). Today's physical therapist educational programs are charged with transforming a diverse applicant pool into a highly trained and effective population of committed practitioners prepared for the rigor of practice in today's healthcare environment.

Post-Professional Training

In order to prepare for the increasing specialized demands of clinical practice, more therapists are electing to participate in a post-professional residency or fellowship-training program as an avenue for professional development. Today the American Board of Physical Therapy Residency and Fellowship Education (ABPTRFE) credentials training programs, which combine didactic education, focused mentoring, and clinical practice in a specialty area for licensed therapists who have already obtained their professional degree (APTA, 2015e). As of 2013, over 2,000 therapists had successfully completed either a residency or fellowship training program.

Specialist Recognition

Though not a requirement for practice, physical therapists may elect to seek advanced practice certification in recognition for their mastery of a focused component of practice. The American Board of Physical Therapist Specialists (ABPTS) grants specialty certification in eight practice areas including cardiovascular and pulmonary, clinical electrophysiology, geriatrics, neurology, orthopedics, pediatrics, sports, and women's health. This board has granted certificates of specialty practice to just fewer than 20,000 physical therapists (APTA, 2015a). Recognition of advanced practice capabilities is also available through a multitude of continuing education opportunities and certificate granting programs.

Continuing Competence

“Physical therapists are healthcare professionals who are obligated to engage in lifelong learning and are ultimately responsible for meeting or exceeding contemporary

performance standards within their area(s) of practice” (APTA, 2007, p. 1). As of June of 2013, 44 states require ongoing professional development and demonstration of continued competence in order to maintain a physical therapist license. In the Federation of State Boards of Physical Therapy’s (FSBPT) Model Practice Act, commentary is provided which notes that, “the public has been increasingly concerned that licensed professionals demonstrate competence to practice.... Mandatory continuing education as the sole method for meeting requirements for licensure renewal is not recommended” (FSBPT, 2011, p. 24). FSBPT notes that simply participating in a course does not ensure competence for practice. Rather, demonstration of engagement in learning and the profession is more likely an indicator of ideal contemporary practice. Though specific requirements vary greatly from state to state, licensees demonstrate their competence through participation in continuing education courses, engagement in classroom and clinical teaching, service to the profession, and dissemination of research.

Clinical Education Today

The historical formation of the profession, its educational practices and the contemporary practice models described above have had profound impacts on the way learners are educated in clinical practice. The pre-licensure training of physical therapists has always relied on practical opportunities for students to learn in practice environments, learning from mentors in the presence of their patients. This form of clinical education has been defined as “that aspect of the curriculum in which students’ learning occurs directly as a function of being immersed within physical therapy practice” (APTA, 2004, p. 159). Similar

to the histories of the profession and of physical therapy education presented earlier, physical therapist clinical education has been shaped by history's events. The methods of clinical instruction previously employed have influenced the way physical therapist clinical education is delivered and assessed today.

Learning experiences in practice was an important component of curricula during the era of Reconstruction Aide training programs. Reed College in Oregon was the first program for Reconstruction Aides. Here, 26% of the time in the curriculum was devoted to clinical education (Pascal, 2002). Though guidelines had previously been published in 1928 that outlined aspects of the curriculum, a minimum number of hours spent in clinical education were not specified until the publication of *Essentials of an Acceptable School for Physical Therapy*. These standards "required 1,200 hours in the minimum curriculum with 400 of these hours identified as clinical practice" (as cited in Gwyer et al. , 2003). This ratio is only slightly lower than the average ratio seen between didactic and clinical education today (CAPTE, 2011). By 1955, when the APTA and the American Medical Association (AMA) performed the first accreditation of physical therapist education programs jointly, the *Essentials of an Acceptable School for Physical Therapy* had already increased their requirement to 600 hours (as cited in Gwyer et al., 2003).

These early clinical education experiences were primarily apprenticeship models and required a variety of different clinical experiences. Worthingham's 1960 report of clinical education indicated that 98% of programs required inpatient hospital experiences, 97%

required outpatient hospital experiences, 92% required experiences caring for adults, and 80% required pediatric exposure in the clinical setting (as cited in Gwyer et al., 2003).

Throughout this history, there were likely almost as many different formats for the clinical education curriculum as there were different programs in physical therapy. The length, in weeks, of each program's different clinical experiences were determined, not by an accrediting body, but by the individual program. In 1985 the average program had three to five clinical education experiences with each one being six weeks in length (Gwyer, 1990).

As the profession moved toward granting more advanced degrees, the expectations in clinical education increased as well. One of the hallmark expectations of the change from masters to doctoral level training is "changes in the clinical education component [of the educational program] such as increased hours, longer rotations, and more [expanded student] roles" (CAPTE, 2011, p. B-iv).

Today the minimum requirement for education programs is to provide a three-year doctoral level curriculum with a minimum of 30 weeks in the clinic (CAPTE, 2011, p. B-34). In 2011 the average number of weeks spent by physical therapist students in clinical education was 35.9 (CAPTE, 2011). To date, no mandate exists specifying the proper length of individual experiences, the ratio of learners to instructor, the variability of practice settings, or the timing of these experiences within the didactic sequence of the program.

There is agreement within the profession that significant time in the clinic is vital to ensure learners have time to appropriately integrate the complexities of clinical practice as they develop professionally. Leaders in the profession have agreed that practical knowledge

and skill are best solidified during extended time in mentorship relations synchronous with clinical practice. Time in supervised practice is necessary for students to begin to form the tacit knowledge necessary for practice. This agreement was demonstrated recently when a consensus conference about physical therapist clinical education convened.

Consensus Recommendation

In the Thirty-Ninth Mary McMillan Lecture, Anthony Delitto, professor and department chair of the University of Pittsburgh physical therapy program, called for reform in clinical education stating,

I believe it is past time for this profession to begin looking at the manner in which we go about the clinical education component of our professional education...The lack of control over what happens in the clinical environment and the economic vulnerability of a system that relies totally on volunteerism should be the subject of sleepless nights among all of my compatriots. (Delitto, 2008, p.1225)

Delitto went on to outline many of the factors he believes contribute to this vulnerability including a high rate of variability between programs, third-party payer, especially Medicare and Medicaid, restrictions on learners in the clinic, and lack of incentives for the clinical sites to accept students (Delitto, 2008).

Just prior to this speech to the professional association by Dr. Delitto, the APTA funded a comprehensive consensus conference consisting of multiple stakeholders both internal and external to the profession. The goals of the conference were to reach agreement on standards for physical therapist education as they related to requirements for a new

graduate, expectations of all involved stakeholders, and methods of delivery for clinical education (APTA, 2010). Following the conference and subsequent regional forums, *Physical Therapist Clinical Education Principles* was published (APTA, 2010).

The report indicated that programs should contain early, integrated clinical education experiences to allow learners to readily solidify knowledge from the classroom with patient care. Late internships should be 10-12 weeks in length and include acute care, rehab, and outpatient experiences. The report also concluded that clinical instructors should exhibit a variety of sound teaching, assessment, patient-care, and professional attributes (APTA, 2010, p. 48-49).

The Clinical Instructor and Clinical Site

This consensus conference report is not the first of its kind to make recommendations for the qualifications of clinical instructors. Previous research indicates that physical therapist students rate their preferred attributes of clinical teachers as good communication followed by interpersonal skills, teaching ability and demonstration of professional skill (Emery, 1984). The APTA (2006a) has provided guidelines for the clinical instructor which address minimum expected levels of clinical competence, effective communication, appropriate behaviors, and effective instructional, supervisory, and evaluative abilities.

Likewise in an effort to promote optimal environments for clinical teaching and learning, guidelines for the clinical site have been provided (APTA, 2006b). This resource document outlines the necessary educational opportunities, philosophies, regulations, resources, staff and responsibilities clinical sites should have in order to provide an effective

environment for students. By providing such an environment, the report suggests that students will be best prepared to meet the rigors of clinical practice upon their graduation.

Unifying Concepts Through History

Throughout its brief but progressive history, the physical therapy profession has demonstrated a collective commitment to ethics, professional advancement, and education. The profession's formation, spurred by the country's needs during war and epidemic, instilled an ethical commitment to society that has expanded in scope as the nation's healthcare needs have changed over time. A commitment to advancement can be traced to the profession's first association meetings when its leaders rallied for better practice regulation, clear role delineation within the healthcare practice environment, and expanded specialized services to its patients. These same concerns have continued to shape the profession's desires for progression throughout the past century, only changing to address the nuanced needs of society. The strong commitment to ethics and professional advancement has driven the profession's storied belief that education is the foundational component of a strong profession. The leaders of the physical therapy profession have consistently demonstrated a progressive and sometimes radical desire to push the limits of training for its students and members. This rich professional history provides context for this study. It is imperative that consideration is given to the historical foundations, professional persona, and embedded attitudes that have likely arisen from the unifying history of physical therapists. Though the unifying concepts discussed herein are likely no different than those of other healthcare professions, physical therapy is now at a point where it is beginning to identify its

own uniqueness within the health professions arena as practitioners who are experts in movement. As noted from the profession's new vision discussed above, the profession sees its societal role as one that provides quality of life through improved movement use. The profession clearly has a commitment to draw on its strong heritage while moving forward, clearly identifying itself as experts of movement. With knowledge of this history, next we will examine how physical therapists approach clinical practice through reasoning and expertise development.

Clinical Reasoning

Clinical reasoning is a central consideration to the competence of the contemporary practicing professional because of the complexity of practice in today's healthcare environment. Clinical reasoning is a concept that is pervasive throughout all decisions and actions in practice. Therefore, one must have an understanding of its effects in practice in order to study how instructors influence students in their development as novice professionals.

Practitioners must be adept at quickly determining the needs of their patient, implementing an effective plan for their care, and assessing their response to the interventions selected. In addition, the healthcare provider should be able to understand the social, personal, and cultural influences that may affect the patient's response to and participation in treatment (Edwards, Jones, Carr, Braunack-Mayer, & Jensen, 2004; Edwards, Jones, & Hillier, 2006; Schenkman, Deutsch, & Gill-Body, 2006).

Revisiting one of the clinical scenarios from the beginning of the chapter provides insight into how the physical therapist's complex reasoning is integrated into his or her own movement.

The physical therapist working with the elderly woman who has suffered a stroke and is unable to move her arm has an infinite number of decisions to resolve during their interaction. What is the underlying pathology? Is the lack of motion solely caused by the stroke? Does she have other impairments from a previous injury? Exactly, which muscles are affected and why? Are they weak, absent of nerve input, injured in another way, tight or painful? Is the lack of motion due to an injury at the joint? The therapist must consider all of these questions as he begins to interact with the patient.

As treatment begins the therapist starts to reason through other factors important to this patient. Does she have family, work, or community, responsibilities, and how are those impacted by her injury? How is she impacted by the inability to perform these duties? How will these changes in her life affect her participation in rehabilitation?

Next, the therapist begins to interact with the patient by the use of his own movement. First he feels the motion she has available in the joints of her arm as he moves the limb segments for her. Next he palpates the joint and each muscle to assess its level of activity and/or injury. He decides how, when, and where to place his hands to provide optimal data for his decisions, while at the same time considering the patient's needs, pain level, and personal preferences.

After a careful assessment, the physical therapist must begin to decide how to improve this woman's loss of movement in her arm. He decides where to place his hands, position his body, and in which directions to shift his weight in order to affect the change he desires in her arm. He carefully provides pressure in specific places, chosen directions, and in a selected timing pattern to initiate activity in her arm. Simultaneously his hands gather data about how her movement is affected, and he continues to make adjustments accordingly.

In an effort to describe this process, researchers and theorists have long studied clinical reasoning in the health professions.

Clinical reasoning is the sum of the thinking and decision-making processes associated with clinical practice; it is a critical skill in the health professions, central to the practice of professional autonomy, and it enables practitioners to take 'wise'

action, meaning taking the best judged action in a specific context. (Higgs & Jones, 2008, location 377)

Arguably, the ability to employ clinical reasoning is at the heart of all clinical practice (Higgs & Jones, 2008). It is precisely this position that makes clinical reasoning such a complex concept. The assumption presented by Higgs and Jones (2008) that clinical reasoning is inextricably linked with every facet of practice implies that theoretical models of clinical reasoning must encompass all decision-making and action taken by a practitioner. In addition, such theories should explain the time-consuming nature of the decision-making process of the novice clinician compared to the seemingly automatic and rapid nature of the expert's clinical actions (Case, Harrison, & Roskell, 2000; C. Doody & McAteer, 2002).

Clinical Reasoning Paradigms

There has been an emphasis on acquisition and recall of knowledge as well as the proper use of psychomotor skills in the clinical care of patients (Cooke, Irby, & O'Brien, 2010). The historical approach to scientific research in which careful and methodical approaches to inquiry and discovery have been the norm mirrors medicine's focus on clinical reasoning (Norman, 2005). Historically, some health professions, like nursing, viewed their clinical decision-making to include foci beyond a methodological search to answer a clinical question. Instead, they routinely sought options to include a broader interpretation of the impact of socio-cultural and personal influences on the patient and practitioner in their clinical decisions (Benner, Sutphen, Leonard, & Day, 2009).

Though nursing long acknowledged the need for careful consideration of influences beyond the clinician in decision making, until recently there remained a dominance of an analytic and positivist approach to studying and describing clinical reasoning across all health professions. Now, many healthcare professions are more cognizant of the benefits involved in considering clinical reasoning paradigms that include the patient's experiences (Higgs, Jones, Loftus, & Christensen, 2008; Norman, 2005). As the body of knowledge about clinical reasoning expanded, Higgs and Jones (2008), proposed organizing the types of paradigms into two broad categories: those models that rely primarily on cognitive processes and those that are interactive by nature.(Table 1.1) Both paradigms have implications for understanding the learning relationship between clinical instructors and their students.

Cognitive paradigms. Clinical reasoning models developed primarily from the cognitive science literature (Elstein, Shulman, & Sprafka, 1990). These models represent a positivist paradigm, assuming that the clinician can arrive at a decision that reflects an ideal truth. This truth is objective and measureable and therefore can be generalized and used predictively in future encounters (Edwards et al., 2004). The cognitive paradigms presented here are often collectively termed “diagnostic reasoning” (Edwards et al., 2004, p. 314). The theory development behind cognitive science, as applied to health professions reasoning, can be traced back to the mid twentieth century as cognitive scientists began to study how people developed ideas, reasoned with conflicting information, and acted upon it. These studies led to theories of problem solving in the early 1970s that described how a person, when

confronted with a challenge, created a mental “problem space” which was influenced by context, available information, and experience. (Simon & Newell, 1971, p. 148-149)

Cognitive paradigms, or diagnostic reasoning, consider that the diagnostician places information into a mental classification system, grouping relative information together, and separating confounding information into its own class. Once clinicians consider these mental sets of information that arise from the patient’s presentation, they compare these to known facts, witnessed events, and experiences to provide a prognosis, plan a treatment session or begin to investigate more avenues of the patient’s case (Charlin, Tardif, & Boshuizen, 2000).

When evaluating the woman after her stroke, the physical therapist needs to determine the exact causes for the lack of movement in her arm. Do tight muscles, inactive nerve input, pain, joint derangement, or a combination of all of these limit motion? Each possibility has a set of visible or testable signs and symptoms that the therapist must next seek to confirm or deny before proceeding in his treatment of the woman.

Hypothetico-Deductive reasoning. Elstein, Shulman and Sprafka (1978) proposed the Hypothetico-Deductive reasoning model as an explanation for the clinical reasoning processes of physicians. This model remains today one of the most widely used paradigms for analyzing, researching, and teaching clinical reasoning in medicine (Edwards et al., 2004). As one of the most enduring models, it is used as a way to conceptualize decision-making across a wide spectrum of health professions.

Hypothetico-Deductive reasoning is a process by which the physician, or health professional, delimits a number of differential diagnoses based on the symptoms presented by the patient (Elstein et al., 1990). These diagnoses are derived from gathering information from the patient interview and examination. One question helps lead to another; one answer

generates the next test. “To transform a problem from unstructured to structured by generating a small set of possible solutions [is] an efficient way to solve diagnostic problems” (Elstein et al., 1990, pp. 9-10).

This approach seeks to maximize cognitive efficiency by confirming or negating information presented with reliable measurement and testing (Edwards et al., 2004). The approach tends to be used by novice practitioners and experienced professionals encountering new or uniquely complex scenarios (Edwards et al., 2004), similar to the dynamic of student interns and experienced instructors participating in this study. With more experience, questioning of the patient becomes more selective, and hypothesis generation happens more quickly and efficiently. The experienced clinician may not have more general hypotheses than the novice, but he or she can arrive at them with better efficiency. This suggests that the experienced clinician utilizes better “domain specific knowledge” allowing his or her questioning of the patient and test selection to be better interpreted in order to confirm or negate the hypotheses in question (Elstein et al., 1990, p. 10).

The Hypothetico-Deductive reasoning method involves both inductive and deductive thought (Ridderikhoff, 1989). The clinician must move through a group of specific observations to generate hypotheses. This represents an inductive reasoning process. The practitioner, then, must also deductively take these generalizations and test them on his or her specific case to confirm his or her hypothesis. “By this strategy, the induction problem is reduced to an issue of deduction, of the form ‘If the patient has X, then he must exhibit the following features’” (Norman, Young, & Brooks, 2007)

As the physical therapist assists the woman attempting to raise her shoulder, he can feel that as she moves her arm to the side, a large indentation appears in the surface of her skin, just as the muscles that cover this indentation become inactive. He remembers this tactile feeling from many of his previous patients who had a stroke, and he immediately knows the small rotator cuff muscles, which hold her arm to her shoulder blade, are extremely weak and incapable of stabilizing her joint has her more powerful shoulder muscles try to raise her arm.

Pattern recognition. Pattern recognition is sometimes referred to as “non-analytic reasoning” (Norman et al., 2007), “forward reasoning” (Hack & Gwyer, 2013), or “illness scripts” (Edwards et al., 2004). In pattern recognition “the clinician recognizes certain features of a case almost instantly, and this recognition leads to the use of other relevant information, including ‘if-then’ rules of production in the clinician’s stored knowledge network” (Edwards et al., 2004, p. 314). The construction of cognitive representations of patient diagnoses demands experience and, therefore, this method of reasoning tends to be utilized most by experienced clinicians (Hack & Gwyer, 2013). Since the clinician can compare patient presentations to representations of previous experiences, this method of reasoning also tends to be faster (Norman et al., 2007). When the experienced clinician has no recognizable pattern to compare his or her current patient presentation to, then the clinician must slow down and revert to hypothetico-deductive approaches to determining an answer to the clinical problem (Edwards et al., 2004). As demonstrated in the above vignette, it stands to reason that the physical therapist’s ability to utilize pattern recognition may be influenced by the tactile information they receive from using his or her hands and bodies to work with patients. Using tactile information in clinical reasoning pattern recognition, however, has not been extensively demonstrated in the literature. Since

pattern recognition relies on a significant experience base to draw upon, this method is of very little use to the novice clinician or student. Instead, it is a strategy that must develop with time and with more varied experiences in clinical practice.

One month ago, the experienced therapist was working with a patient whose lower leg would not move in a coordinated fashion after she had a stroke. The therapist tried all of the usual treatment methods. Knowing the patient was an accomplished dancer throughout her life, he decided to play some of her favorite, upbeat music and encouraged her to tap her foot to the rhythm she heard. Ever so slightly, the otherwise inactive muscles began to twitch in synchrony to the beat. Now faced with a similar scenario with the woman's arm that lacks motion, he sits her in front of a piano, just like she does every Sunday morning at her church, and asks her to play. Though she doesn't have the strength to push the keys enough to make a sound, her fingers begin to flex.

Intuitive reasoning. Some consider intuitive reasoning to be the same as pattern recognition. However, other researchers suggest this form of clinical decision-making relies on the practitioner using “instance scripts” (Higgs & Jones, 2009, Table 1.1). These instance scripts allow a clinician to compare a current patient presentation with a very specific occurrence that they experienced previously with a patient. Whereas pattern recognition is formed by the compilation of many different similar cases, intuitive reasoning is derived from one specific instance. Similar to pattern recognition, however, it is only after previous unique cases are presented that the clinician is able to utilize intuitive processes in his or her reasoning. Once again, this is limited for the novice clinician, or even for the experienced clinician who has had little exposure to alternative scenarios or treatment approaches.

Interactive paradigms. As outlined above, the cognitive paradigms each have limits. In addition, they all focus the locus of control to the clinician and do not consider the unique values and experiences of the patient. However, since the mid-1990s researchers

have paid greater attention to other forms of clinical reasoning extending beyond the cognitive paradigms (Edwards et al., 2004).

In the late twentieth century consumers began to be more knowledgeable as health information became readily available via technology to the lay public. In addition, sweeping governmental reform empowered the patient to play more of a role in the decision making process for his or her healthcare. These factors combined to force change in the health professions. Where previously the practitioner was able to make clinical decisions based solely on his or her prior knowledge and experiences, now he or she needs to consider his or her patient's desires and integrate these into the plan of care (Christensen, Jones, Edwards, & Higgs, 2008).

Many of these efforts in the health professions to integrate patients' values in clinical decision making build out of an understanding of the benefits of "reflection-in-action" as a method for discovery and development of knowledge (Schön, 1987). Reflection-in-action calls for the decision maker to acknowledge that his or her choices and decisions have implications for the patient and, therefore, should attempt to incorporate the infinite, yet specific, variables that each individual patient presents. The interactive paradigm, therefore, shifts the clinician out of a positivist approach of knowledge generation and identification of truth, to one in which patients' values, social contexts, and experiences have merit and inform the clinician's diagnostic process. The interactive approach, sometimes referred to as interpretive, "...recognizes that truth or knowledge is related to meaning and the context in

which it is produced and, therefore, concedes that in any given situation there may be multiple realities, truths, or perspectives” (Edwards et al., 2004, p. 314).

Through garbled speech the woman begins to tell the physical therapist about her life. She tells him she is a wife, a mother, and a board member of a prominent company, all of which cause stress in her life. She is active in her community, playing music weekly at her church and volunteering with a local women’s club. Her favorite activity is spending time with her three grandchildren, and she especially loves to play Frisbee with them in the park when the weather is nice. She becomes teary when she tells the physical therapist that in six weeks her youngest daughter will get married and wants her mother to play a prominent role in the ceremony and reception.

Narrative reasoning. When patients tell their story, or clinical history, many emphasize certain aspects, deemphasize others, and omit parts of the narrative altogether. Likewise, the practitioner engages in narrative reasoning when he or she enters into a process that seeks to understand the individual patient’s experience (Mattingly, 1991). The professional attempts to understand why his or her patients emphasize a portion of their symptomology in an effort to determine how this plays a role in the therapist’s diagnosis and care. For example the healthcare provider reasons narratively when he or she “want[s] to explain not whether someone has Parkinson’s disease, but rather, why the patient’s wife is so unwilling to have her husband be discharged home” (Mattingly, 1991, p. 999).

By examining the patient’s story and using narrative reasoning to attempt to understand it, better insight is gained into the patient’s “experiences of disability or pain and his or her subsequent beliefs, feelings, and health behaviors” (Edwards et al., 2004, pp. 314-315). The cognitive paradigms presented earlier assume the practitioner unilaterally arrives at a decision based on the information presented. Conversely, narrative reasoning seeks to

build consensus between the practitioner and the patient so that the healthcare professional realizes an understanding of the patient's experience to arrive at an optimal plan for the patient (Mattingly, 1991).

Alternative forms of interactive reasoning. Higgs and Jones (2009, Table 1.1) summarize several other forms of interactive reasoning that have been reported in the literature. These include multidisciplinary reasoning amongst a variety of healthcare providers simultaneously; conditional reasoning which is used to gauge patient response to treatment and predict resultant outcomes; collaborative reasoning which allows the practitioner and the patient to engage in shared decision-making; ethical reasoning which includes how a clinician resolves political, moral, and economic dilemmas in the context of patient care; and teaching as reasoning in which the practitioner guides the patient through information with the intent to change his or her behavior. All of these interactive reasoning strategies are well documented in the literature. They each have many similarities with the hallmarks of narrative reasoning discussed above. Primarily, each interactive reasoning strategy assumes that there are multiple possible truths and that the patient's experiences and opinions have value in the diagnostic and treatment processes (Edwards et al., 2004).

Communicative and instrumental action in the paradigms. As described above, the strengths of the cognitive paradigms lie in their ability to draw on the clinician's knowledge, skill and experiences but may omit the values of the patient. Conversely, the interactive paradigms shift the focus to the patient but must be supplemented by the

information the clinician acquires during training and experience. We must consider how these two somewhat oppositional paradigms work in concert.

Edwards et al. (2004) associate these two types of learning and action with the two paradigms. According to the authors, knowledge, created from a positivist paradigm including the diagnostic reasoning strategies of hypothetico-deduction and pattern recognition, generates instrumental learning and action. Conversely, knowledge generated out of an interpretive paradigm, such as narrative reasoning, leads to communicative learning and action.

Disciplinary Perspectives on Clinical Reasoning

Clinical reasoning is also influenced by one's professional background and training. Professional roles and identity play a key part in how a health professional chooses to solve a problem.

[Practitioners'] interpretations of who they are and who they should be in their professional roles directly relate to how they frame situations or identify problems to be solved, and how they think through and act upon decisions they make. Clinical reasoning is a process that not only permeates each aspect of an individual clinician's practice, it is also a concept that crosses professional boundaries. (Christensen, et al., 2008, "Facilitating the Development of Clinical Reasoning Capability Through Professional Socialization", para. 2)

Clinical reasoning, therefore, is a pervasive topic that is reported throughout the literatures of medicine, nursing, occupational therapy, and physical therapy. Each discipline

has historical research and theory perspectives that mirror the changing acceptance from a purely positivist paradigm to those that include aspects of interactive approaches (Dutton, 1995; Edwards et al., 2004; Hack & Gwyer, 2013; Higgs et al., 2008). Rather than discuss the vast similarities between these professions, I will discuss some of the key differences in how the professions of medicine, nursing, occupational therapy, and physical therapy employ aspects of the different clinical reasoning paradigms in contemporary practice.

Medicine's analytic approach to clinical reasoning. In Flexner's 1910 report on the current state of medical education and his recommendations, the positivist influences on clinical reasoning can clearly be seen (as cited in Irby, Cooke, & O'Brien, 2010). Flexner encouraged programs to "train physicians to 'think like scientists' using scientific inquiry and research to solve clinical problems" (Irby et al., 2010, p. 221). One-hundred years later a follow-up report on the state of medical education still recognized a need to educate future physicians to embrace individualism in their clinical practice and to integrate clinical and social sciences as a way to combat a "fragmented understanding of patient experience" (Irby et al., 2010, p. 225). The contemporary challenges in medical education outlined by Cook et al. (2010) likely reflect the profession's continued primary reliance on cognitive, or diagnostic, paradigms for clinical decision-making.

In their review of clinical reasoning models and educational implications in medicine, Schwartz and Elstein (2008) summarize the growing body of literature in recognition of a "two-system" method of reasoning applied to medicine ("The Two-System View", para. 1). This model recognizes that the clinician may utilize the benefits of pattern recognition and

intuitive reasoning to make quick decisions that are often accurate but remain susceptible to biases and the current emotional state of the clinician. The second employable system, however, is engaged in a slow analytic style using all available data allowing for a flexible style of reasoning that may eventually lead to high cognitive load (Schwartz & Elstein, 2008). Advocates of his “two-system” approach in medicine posit that it allows for the value of using multiple reasoning strategies in concert. However, these authors point out that this two-system approach primarily relies on cognitive diagnostic paradigms for clinical decision-making (Schwartz and Elstein, 2008, “The Two-System View, para. 1).

Heuristics and context in the clinical reasoning of nurses. As stated earlier, clinical reasoning in nursing has long embraced the profession’s ideals of patient-centered care (P. Benner, Tanner, & Chesla, 1996). In their review of the current state of nursing education, Benner, Stuphen, Leonard and Day (2009) discuss the rapidly changing role of the nurse in today’s healthcare environment to one that includes more responsibility as physicians function more as diagnosticians and prescribers and “nurses, patients, and family members administer these treatment regimes” (Benner et al., 2009, p. 21). The authors go on to note that this shift in responsibilities has led to an increased demand on the clinical judgment and decision-making required of today’s practicing nurse.

Recently, clinical reasoning in nursing has been defined as a “complex task geared towards the identification and management of patients’ health needs that requires a knowledgeable practitioner along with reliable information and a supportive environment” (Fonteyn & Ritter, 2008, "Definition of Clinical Reasoning", Para. 1). In a qualitative study

of critical care nurses asked to think aloud as they problem solved a case study, researchers found that nurses form relationships between concepts and dichotomize between relevant and irrelevant data (Fonteyn & Grobe, 1993). This process relied heavily on heuristic reasoning-thinking strategies acquired from similar patient case scenarios in the past. A review of clinical reasoning in nursing indicates that it is both intuitive and context dependent. The nurse is reliant on past experiences and present information from his or her patient to make sound clinical judgments (Fonteyn & Ritter, 2008).

Three holistic tracks of occupational therapy clinical reasoning. As experts in assisting injured clients to participate in the activities required for daily living, occupational therapists approach patient care with a “holistic perspective, in which the focus is on adapting the environment to fit the person, and the person is an integral part of the therapy team” (American Occupational Therapy Association, 2013, Para. 3). As a profession, occupational therapy’s historical roots in humanism are evident in its contemporary approaches to clinical problem solving (Chapparo & Ranka, 2008). Clinical reasoning in this profession integrates a three-pronged reasoning approach inclusive of diagnostic reasoning, narrative reasoning, and pragmatic reasoning (Schell & Cervero, 1993). This form of reasoning acknowledges the contextual nature of the settings in which patient-client interactions occur and considers organizational constraints, values, resources, trends in practice and reimbursement considerations as important players in the clinical reasoning of the therapist. The occupational therapist has been described as having a three-tracked mind consisting of (a) the procedural track, concerned with the patient’s diagnosis; (b) the

interactive track, focused on the patient as an individual; and (c) the conditional track, which is provisional and holistic related to the patients' participation in their environment (Dutton, 1995, p. 7).

Collaborative clinical reasoning in physical therapy. Physical therapists consider the patient's unique circumstances in the rehabilitation process, leading to a model of clinical reasoning that is both "hypothesis-oriented and collaborative" (Jones, Jensen, & Edwards, 2008, "The clinical reasoning Process in physiotherapy: hypothesis-oriented and collaborative", para. 1). Jones et al. (2008) indicate that for sound clinical reasoning physical therapists must utilize a wide range of scientific, procedural, and professional knowledge, implore cognitive processes in the form of data analysis, synthesis, and inquiry, and engage in metacognitive processes of self-awareness and reflection. This metacognitive process "allows clinicians to monitor their data collection, clinical reasoning and clinical performance, also taking into account any knowledge limitations linking their broader societal and cultural beliefs and values that, along with propositional and craft knowledge, underpin their practice" (Jones et al., 2008, "Metacognition", para. 1).

Several authors have proposed models of clinical reasoning in physical therapy that consider the plural nature of using a cognitive hypothesis-oriented approach simultaneously with collaborative and interpretive considerations of the patient's goals and personal circumstances (Atkinson & Nixon-Cave, 2011; Edwards et al., 2004; Embrey, Guthrie, White, & Dietz, 1996; Schenkman et al., 2006). The most contemporary models of clinical reasoning in physical therapy are inclusive of the World Health Organization's (WHO)

International Classifications of Functioning (ICF) which considers aspects of health and disability by focusing on the patient, his or her context, and factors that facilitate and inhibit his or her personal health condition (WHO, 2001). Such patient-centered care models seem to have found a balance that reflects the dialectical nature of clinical reasoning in physical therapy (Atkinson & Nixon-Cave, 2011; Edwards et al., 2004; Schenkman et al., 2006).

The dialectical nature of clinical reasoning in physical therapy requires a strong metacognitive reflective component (Edwards et al., 2004). Reflection-in-action is considered to be a significant contributory factor in professional development and progression towards expertise (Schön, 1987). In their study of expert physical therapists, Jensen et al. (2000) found collaboration a vital component to optimal practice in physical therapy.

Collaboration between therapist and patient was central to the clinical reasoning process. The patient as a valued and trusted source of knowledge was a critical focus in the assessment process....Once the problem(s) are identified and the context understood, the therapist engages in collaborative problem solving with the patient and family and in educating them about movement and function...” (pp. 37-38).

Collaboration, context, and knowledge are demonstrated as key aspects of clinical reasoning. As discussed previously, clinical reasoning is *the* core aspect of practice that is inextricably linked with everything else. Though Jensen et al. (2000, 2007) noted it as a separate component of expertise, knowledge, virtues and movement all are influenced by reasoning, and in turn must influence the clinician’s ability to reason.

As physical therapists negotiate clinical reasoning in the complex environment of contemporary practice, it is a certainty they will face ambiguity in their decision-making. Use of any of the models discussed above implies the therapist must make decisions at multiple points of uncertainty. When speaking of expert physical therapists, Jensen et al. (2007) states that, “the therapists welcomed challenges of tough patients and were comfortable with uncertainty and ambiguity—that is, not knowing the answer” (p. 161). Experts who embraced ambiguity in their practice decision-making were further noted to utilize a metacognitive approach. (Jensen et al., 2007; Jones et al., 2008)

The Importance of Movement Use to Clinical Reasoning

In the scenario presented earlier of the physical therapist challenged by the treatment of a previously active businesswoman and grandmother, the physical therapist uses a collaborative and integrative approach to clinical reasoning. As a physical therapist, he embodies the use of movement in practice in an effort to aid the movement and mobility of his patient, and therefore considers all aspects of her pathology, impairment, and life circumstances when making decisions about her care. If we could watch him treat, we would undoubtedly see demonstration of constant collaboration through his and her movements. Most importantly, as his hands guided her shoulder he noticed the dent in her skin. She may have winced in pain, and he gently returned her arm to her side. As she talked about her love of community and church involvement, he coupled his previous experiences with a dancer to try a new treatment strategy that utilized the current patient’s interest in the piano. And as he reckoned with the prognosis he assumed from his knowledge of the severity of her stroke, he

knew he would have to accelerate his expectations in order to achieve the patient's goal to fully participate in her daughter's wedding. These decisions are not just what he knows, but what he does. The treatments and movements he employs are not just facts and skills he possesses, but who he is as a physical therapist. Though the clinical reasoning literature denotes a clear epistemological understanding of how this therapist acquired the knowledge necessary to make decisions, there is less of an ontological approach to understand how he became a physical therapist.

This study seeks to better understand how physical therapists, like the one described in this scenario, possess an ontological embodied sense of movement in their practice. Reflecting on the varied methods of reasoning in the clinic and how they are used differently by novice and experienced practitioners allows a deeper understanding of the challenges facing learners and their instructors in clinical education. As instructors face the challenge of facilitating their students to develop the use of movement in their practice, they are also confronted with the challenges of a learner who is unable to effectively use pattern recognition, intuitive reasoning, or narrative reasoning because of their lack of prior experience. This undoubtedly has unknown consequences on how the instructor perceives and subsequently develops the student's use of movement in practice. Likewise, faced with a deficit in clinical reasoning abilities, the student will likely experience the use of movement differently in patient care than will his or her experienced instructor. These divergent abilities in clinical reasoning may need to be negotiated in order to develop the use of movement in practice, a key component of the practice of expert physical therapists.

Hallmarks of Expert Practice

Another one of the scenarios presented at the beginning of the chapter demonstrates how clinical reasoning plays a role in the development of practice expertise.

The pediatric physical therapist assists the small child to walk by strategically placing her arm around the child's trunk, and grasping each leg at key places to control the tiny limbs and provide balance through the child's body. Watching this happen, it appears effortless on the part of the clinician, and what moments before seemed impossible to the child now feels attainable. Meanwhile, as the child is facilitated to take rudimentary steps across the clinic floor, the physical therapist's mind is engaged in consideration of the pathology at play, an understanding of the muscle connections and nerve interactions that typically power ambulation, a prognostication of this child's life path with this disability and the implications of today's treatment on her future ambulatory ability.

In addition, the therapist is extremely cognizant of her hand placement to facilitate the muscles she wants active throughout the child's legs and trunk, but not to over excite muscles that would prevent the wanted action. Simultaneously, she feels the child's movement through her own hands and body and adjusts to it accordingly by shifting her weight, releasing her pressure, or moving one of her points of contact.

The therapist uses her understanding and previous experiences to make accurate and deliberate decisions, not only about this specific treatment session, but about how the efforts to help this child walk today will impact the treatment later this week, next month, the following year, and when this child is a young adult.

Finally, the therapist provides patient-centered care, not only to the child, but also to her mother who is present and watching. The therapist holds the utmost respect for the patient's values at hand and demonstrates ultimate professionalism as she engages in her plan of care. Her knowledge, use of skilled movement, her clinical decision making abilities, and her application of her values as a professional combine to demonstrate her expertise as a physical therapist.

The body of literature describing expertise is immense. Each profession has an extensive cadre of literature and evidence that describes the unique development, history, and practice of experts within their respective fields. A full exploration of the expertise literature is beyond the scope of this study. I, therefore, seek to describe expertise to provide a context for understanding the pathway that is set before physical therapy students as they enter

professional practice. It is important to understand the culmination of professional development in order to describe and study professional formation at the initial point of entry into practice.

A Definition of Expertise

Expert practice is defined in many different ways. The Oxford English Dictionary defines an expert as “a person who is very knowledgeable about or skillful in a particular area” (Oxford University Press, 2013, "Expert" para. 1). In describing the influences of forward reasoning and enhanced recall on expertise in medicine, Patel and Groen (1991) describe experts’ ability to arrive at “the attainment of an accurate or complete solution to a well-defined problem in the expert’s knowledge domain” (p. 95). However, for the purposes of my study, I choose to conceptualize expert practice as a continually developing process. Bereiter and Scardamalia (1993) caution against attempting to define what expertise is, but instead, describe *whom* an expert is in terms of their development, their decisions, and their actions. As they state when describing the career path of an expert:

[It] is one of progressively advancing on the problems constituting a field of work, whereas the career of the non-expert is one of gradually constricting the field of work so that it more closely conforms to the routines the non-expert is prepared to execute.

(Bereiter & Scardamalia, 1993, p. 11)

This conceptualization of expertise suggests that an expert is more than the sum of his or her knowledge and skill, but instead is a distinct type of practitioner that is also defined by the

way he or she uses his or her skills and knowledge to progress his or her individual experience and his or her profession.

Developing Professional Expertise

Historically, acquisition of skill and knowledge has been viewed as a step-wise process with a linear path toward expertise (Dall'Alba & Sandberg, 2006). These concepts of professional development provide the foundation upon which later researchers have described their proposed theoretical frameworks that discuss an embodied approach to professional development, which may occur via many different trajectories (Dall'Alba, 2009b).

Gaining knowledge and skill through reflection and interaction. It is important, first, to consider how professionals acquire and apply the knowledge, skills, and attitudes that form the foundations of their development. Schön (1987) was one of the first theorists to suggest that knowledge and practice cannot, nor should not, be thought of as separate. He describes opportunities for rich discussion, learning, mentoring, and growth as a component of professional development he terms “knowing-in-action” (1987, p. 25). Schön argues that learning occurs by doing. Practicing and experiencing facilitate better knowing. “Schön argues strongly against separating the acquisition and application of knowledge in professional education....He regards such a separation as providing an inappropriate preparation for the complexities of professional practice” (Dall'Alba, 2009b, p. 16).

Lave (1991) and Wenger (1999) further describe how this acquisition of knowledge in practice is embedded deeply in the social context they term “communities of practice.”

“Communities of practice are formed by people who engage in a process of collective learning...[and] who share a concern or passion for something they do and learn how to do it better as they interact regularly” (Wenger, 1999, para. 1). These authors advocate for learning in context with community in an effort to solidify knowledge and progress skill.

These concepts of knowledge and skill acquisition are potentially demonstrated in physical therapist education through the requirement for embedded educational experiences in the clinic (CAPTE, 2011). Students are required to repeatedly join with experienced clinicians and other students to gain knowledge and demonstrate practice skills acquired through didactic and clinical education (CAPTE, 2011). Though training requirements demand practice with experienced clinicians situated within a typical workplace environment, little is known about how these learning relationships may lead to the development of the use of movement in a physical therapist’s practice.

Dreyfus’ model of skill acquisition. Originally, studies of professional development and skill acquisition focused on generalized serial problem-solving strategies employed by those identified as experts (Holyoak, 1991). Dreyfus and Dreyfus (1986) expanded theories of skill and knowledge development when they responded to the prevailing opinions within the artificial intelligence sector that reason and intuition were not requisite factors for analyzing the world. They state, “As human beings acquire a skill through instruction and experience, they do not appear to leap suddenly from rule-guided ‘knowing that’ to experience-based “know-how” (Dreyfus & Dreyfus, 1986, p. 19). Their study findings provide five linear stages to describe the process of skill acquisition: novice, advanced

beginner, competent, proficient, and expert (Dreyfus & Dreyfus, 1986). Each stage is distinguished from the previous by three aspects in which the individual approaches a skill. These are (a) a move from abstract principles to reliance on past experiences; (b) movement from seeing the situation as the sum of many parts and more as a whole problem to be examined; and (c) a change from a separate observer to an active participant in the problem (Benner, 1984, p. 13).

Dreyfus and Dreyfus (1986) describe the stages as summarized here. In the novice stage, one follows rules and applies them to the situation as they have been instructed to do, usually independent of the context surrounding the situation. Progression to advanced beginner is marked by the ability to apply context to the rules previously learned. Competent professionals are able to generate a plan with goals and devise how to apply rules to accomplish their intended plan. Those acting at a level of proficiency are the first to be able to use previous experience to assess a situation instead of approaching every scenario as if it is a new one. Finally, experts rely heavily on situational experience and do not rely on rules but instead use their tacit knowledge and experience to approach situations holistically.

This model marked an advanced approach to skill development theory in several ways (Dall'Alba & Sandberg, 2006, p 388). It recognized that professional development was context dependent, and learning should not be separate from the situation in which the skill was to be performed. This model was the first to acknowledge that those operating at lower levels on the trajectory approached new situations in a deliberate and step-wise fashion. Higher-level participants, instead, used intuition in their problem solving. Finally, this model

was the first to explicitly recognize that high levels of performance (i.e. expertise) could only be achieved through practice in context, in a practical workplace venue.

Application of the Dreyfus model in healthcare. In her classic work to study and define developing expertise in nursing practice, Benner (1984) applied the Dreyfus stage model of skill acquisition and later further expanded her ideas and applied them more broadly within the context of professional theory and practice (Benner et al, 1996). Benner described each of the five stages with unique examples from her study, pertinent to the professional practice of nursing (1984). She described the novice stage as being independent of general level of experience and, instead, context dependent to practice location. “Any nurse entering a clinical setting where she or he has no experience with the patient population may be limited to the novice level of performance, if the goals and tools of patient care are unfamiliar” (Benner, 1984, p. 21). She describes the nurse at the competence stage as typically having been in that specific setting for about two or three years, able to develop a plan of care that is derived from the contextual situation. As described by Dreyfus and Dreyfus (1996), Benner (1984) marks entry into proficiency by the ability to apply previous clinical experience to a situation and use that experience to appropriately abandon rules necessary to accomplish the care a specific patient requires.

In describing professional development in nursing, Dreyfus and Dreyfus (1996) argue that to achieve expertise, a professional must be able to integrate theory about his or her practice into action. “Briefly summarized...while practice, without theory, cannot alone produce fully skilled behavior in complex coping domains such as nursing, theory without

practice has even less chance of success” (Dreyfus & Dreyfus, 1996, p. 29). Benner (1984) describes this ability of clinicians when she summarizes the ability of expert nurses to rely heavily on their experiences, but immediately be able to revert to analysis and integration of practice theory when confronted with a new or problematic scenario.

Critique of the Dreyfus stage model. Though the theoretical framework of skill acquisition proposed by Dreyfus and Dreyfus (1986), and described by Benner (1984), has offered immense insight into the ways clinicians learn and develop toward expertise, this stage model leaves little room for deviation from the predicted pathway described by the original theorists. Some researchers have called for a new generation of thought in regards to professional practice and development that “will increase our understanding of the connections between expertise, experience, learning, and knowledge compilation” (Daley, 1999, p. 135) and explore alternative paths to expertise and the causes of variability in professional progression (Dall'Alba & Sandberg, 2006).

Benner’s studies (Benner et al., 1996; Benner, 1984) began to expand upon Dreyfus and Dreyfus’s notions of a direct path through the stages. Benner (1984) recognized there was a complex relationship between seven different domains of practice (p. 46) and introduced the idea that emotion was a factor integral to judgment in nursing practice and expertise development. The recognitions of multiple dimensions of professional practice by Benner et al. (1996) provide support for the call for models of professional development which consider more than a stepwise trajectory of skill and knowledge acquisition leading to improved professional performance as described by Dreyfus and Dreyfus (1986).

Expertise in Physical Therapist Practice

Turning our attention to expert physical therapists, the work of Jensen et al. (2007) forms the foundation for the study of who experts are, not just what they do. These authors agree that the attainment of expertise is a developmental process. Through their study they take “the assumption that expertise should be seen as a continuous process, not as a state of being, because the ultimate goal of studying expertise is enhancing the professional development of novices and lesser-skilled practitioners” (Jensen et al., 2007, p. 20). These researchers applied a qualitative composite case study design with a grounded theory approach to explore the unique qualities of experts across four specialty areas in physical therapy. Subjects were peer-nominated from the orthopedic, neurology, geriatrics, and pediatrics specialty practice sections of the American Physical Therapy Association. The outcome of the study was a theoretical model of expert practice in physical therapy.

The theoretical model...represents four major dimensions of expert practice in physical therapy that were identified as a result of...data analysis: knowledge, clinical reasoning, movement, and virtues. At the center of this expert practice model is the therapist’s conception of practice that emerges from the four dimensions. (Jensen et al., 2000, p. 34)

Physical therapist experts’ knowledge represents a “multidimensional” level of understanding that, despite their specialized practice, is always patient-centered (Jensen et al., 2007, p. 151). The study revealed that expert physical therapists continually seek opportunities to gain new knowledge that will impact their practice. Expert physical

therapists also demonstrate clinical reasoning that is a “collaborative process between therapists and patients or patients and their families” (Jensen et al., 2007, p. 154). The therapists studied demonstrated high levels of moral commitment and devotion to their practice and their patients. These “virtues” were central to their philosophies of practice (Jensen et al., 2000). Finally, the experts utilized movement as a core component of their practice. “Beyond demonstrating, guiding, and facilitating functional movement in patients, all of the therapists used their hands to communicate with patients (e.g., for reassurance, facilitating safety, and comfort and praising)” (Jensen et al., 2000, p. 39). These four dimensions combine to inform the experts’ personal philosophies of practice.

Implications of expertise for student learning. Among other recommendations the researchers stress that students, in addition to gaining knowledge in their programs of study, be taught to use their own hands to facilitate change and improve function of their patients (Jensen et al., 2000). The authors also acknowledge that further study needs to be done to understand how and why some therapists develop into experts. In order to maximize the potential of all physical therapists to achieve expertise, resources must be in place to aid in the development of each of the four dimensions of expert practice described above. The profession has a storied history of education and degree advancement, evidence-based resources and production of primary research, and an ever-expanding cadre of post-professional residency, fellowship, and continuing education training initiatives. These all serve in an effort to maximize and optimize knowledge of the physical therapist. Researchers and clinicians continue to address moral commitment, or “virtues” (Jensen et al.,

2007), through the use of the Core Values and the Code of Ethics (Swisher & Hiller, 2010) as core documents for the discussion and application of professional commitment and patient-focused practice (APTA, 2012b; Swisher & Hiller, 2010). Researchers and physical therapists also work to better understand the clinical reasoning process of physical therapists and integrate these findings into the professions' agendas and educational processes (APTA, 2015f; Edwards et al., 2006).

However, very little work has been done to understand the unique use of movement by physical therapists in their practice. The profession has demonstrated a commitment to better understanding and integration of three of the four dimensions of expert practice outlined by Jensen et al (2007), but “movement” remains an area to which little attention is paid, despite the fact the profession sees itself as experts in movement. This study examines how the use of movement begins to develop as students engage in mentee relationships just prior to entry into the profession.

Movement in Practice

An athlete lies on his back on a treatment table as his physical therapist palpates all the bones in his neck one at a time. Gently she presses on each bone and checks for a reaction from the patient. Finally, she finds the root of the pain extending down the player's arm all the way to his fingertips. Next she begins to perform well-rehearsed movements. While one hand, powered by the strength of her arm pushes the offending bone in a very specific direction, her other arm, strategically placed on the bone below prevents any motion of it, thereby increasing the effectiveness of her mobile hand on the bone above.

As the physical therapist continues to perform these movements, she is reminded of hours of practice in a classroom lab where she awkwardly tried to perform this on one of her classmates. She recalls how during her clinical internships, her instructor guided her through this process for the first time with a patient by gently placing his own hand on hers and providing the tactile instruction she needed to feel the proper movement. Now, years later, she has refined this

movement after providing care to countless other patients with similar neck pain. Her skill and proficiency are confirmed as the patient breathes a sigh of relief and tells her the pain has dissipated in his arm.

There is ample evidence that physical therapists are proficient in understanding human movement and its effects on pathology (CAPTE, 2011). Furthermore, there are clear mandates from educational and accrediting bodies that movement science is a crucial component of physical therapy education (CAPTE, 2011). However, there is, to date, no clear understanding of how physical therapists' use of movement is developed and integrated into their practice.

Learning Through Movement

A discussion of the role of movement and its influences on the epistemological development of physical therapists could not be complete without consideration of the growing body of literature that seeks to describe how movement plays a role in learning. This body of literature is incredibly diffuse. As movement permeates all aspects of human life, commentary on how learning is influenced by movement permeates the literature in an infinite number of ways. The reciprocal influence of learning and movement is often described in the arts performance literature, sports enhancement and psychology, and physical education.

The literature from the world of dance performance describes how movement through dance enhances cognitive skills, social awareness, and motor coordination of both very young children as well as adults (Hanna, 2000; Keinänen, Hetland, & Winner, 2000; Lorenzo-Lasa, Ideishi, & Ideishi, 2007). Likewise, the intricate movements associated with

musical performance have been described in relation to how they are tied to learning and how injury affects that relationship (Jankovic & Ashoori, 2008; Palmer, 2001; Pica, 1995; Zatorre, Chen, & Penhune, 2007). Sports psychologists and physical education experts have historically described the intricate and crucial process learning played in performance of movement. Evidence demonstrates mental and physical practice strategies are key in the development of optimal movement (Blakemore, 2003; Rutherford & Jones, 1986; Singer, 1988; Wulf & Prinz, 2001).

Much more familiar to the profession of physical therapy are the concepts of motor control and motor learning applied to patient care (Schmidt & Lee, 2011). This field, which is an integral part of physical therapist education, describes the complex interplay of the neurophysiologic processes involved in the production and sensation of movement, as well as psychology and its perspectives on how motor learning occurs and how skills are performed. The interconnectedness of these two historically separate fields is important to the profession of physical therapy. Physical therapists are the healthcare clinicians who must rectify problems of neurologic and anatomic pathology with treatment strategies which utilize movement in a variety of practice methodologies (Schmidt & Lee, 2011). Again, this important body of movement literature is far too expansive to describe here.

The literatures of motor control, motor learning, as well as athletic and artistic performance generally seek to describe and understand how movement is performed, enhanced, or remembered. Though this information plays a key role in how a physical therapist learns to utilize movement in his or her practice, it is more crucial for the purposes

of this study to examine how movement is experienced and integrated into one's existence as a professional.

An emerging body of literature now exists to describe the process by which adults experience and integrate movement into their existence (Amann, 2003; Brockman, 2001; Edwards et al., 2006; Horst, 2008). This type of learning is "being labeled somatic or embodied learning—that is, learning through the body" (Merriam, Caffarella, & Baumgartner, 2007, p. 190). We may better understand the role of movement in physical therapy when we consider learning through the body. As Merriam et al. (2007) state, "attending to these noncognitive dimensions of knowing can bring greater understanding to our lives; they enable us to make meaning of our everyday experiences" (p. 192).

Somatic Learning Model

Authors agree that creating a finite definition of somatic learning is an inherent challenge given that it can cross many different domains and build from many other learning theories (Amann, 2003; Brockman, 2001; Horst, 2008). "While the range of learning that is classified within somatic learning is broad and interpreted differently, it is the body itself that continuously emerges as a multi-faceted force for making meaning of our experience" (Horst, 2008, para 2). Because of this broad interpretation, Horst (2008) proposed a model for somatic learning. This model emerged from her review of the pertinent literature and "encompasses four domains, with each being somatic in nature: kinesthetic learning, sensory learning, affective learning and spiritual learning" (Amann, 2003, para 9). According to Horst (2008), these four aspects of somatic knowing can play variable roles in each learning

experience, and each may be integrated to a greater extent based on a person's individual experience (para 7).

A later revision of the same model proposes that these four domains are influenced by three elements: dialogue, reflection and cognition (Horst, 2008, para 11). This revision was developed in response to the author's action research with women managers participating in a yoga experience. Through this research it became evident that the three elements were necessary to foster an appropriate somatic pedagogy (Horst, 2008).

Horst (2008) points out that although somatic learning is very experiential in nature, its effects as a holistic approach may provide for a transformative experience for learners. This experience is powerful for the learner because of the multifaceted way in which the body and mind experience knowledge acquisition (Amann, 2003).

Somatic Knowledge and Cultural Understanding

Brockman (2001) discusses somatic learning from a slightly different perspective. He agrees with other authors that somatic learning occurs through the body's experience. He argues that this is an optimal learning strategy for understanding and embodying culture. This is different than knowing through a cultural-linguistic approach in which one experiences culture via traditions, morals, or history. "Neither culture nor language are the *source* of somatic knowledge. Somatic knowledge is received from *within* the human being; cultural knowledge is received from *without* the human being" (Brockman, 2001, p. 312)

Brockman indicates that this view of somatic learning extends beyond traditional views of racial or ethnic culture (Brockman, 2001, p.312). The healthcare professional

literature has many examples of the cultures that exist within a profession (Cromie, Robertson, & Best, 2002; Holland, 1993; Suominen, Kovasin, & Ketola, 1997). If movement is a primary concept in the professional culture of physical therapy, Brockman's view of somatic learning may give support to the idea that physical therapists experience an epistemological development through movement. For example, a student may learn to help a patient that has suffered a debilitating injury walk again by hearing lectures, practicing techniques with classmates, and studying notes. However, the ultimate learning may occur when the student's own body experiences the process of helping the patient to recover through the physical assistance the student offers, the manual techniques employed for treatment, and the ability to feel the movement of the impaired patient under the therapists' hands.

Furthermore, the somatic learning model would apply to this same example (Horst, 2008). The student's experience with the patient involves kinesthetic movement, an awareness of the patient's response to treatment through the student's sense of sight, sound, smell and touch, an emotional response of the student to the patient's experience and potentially a spiritual connection. Contrast the experience of the student learning via the somatic model to that of a more experienced clinician, and we may see an enhanced ability to apply the elements of cognition, reflection and dialogue. Though there is no current evidence to support how a somatic learning experience may facilitate the epistemological development of a physical therapist, evidence is available in the literature to support the importance of movement as a concept for learning in physical therapy.

Somatic Knowledge in Professional Development

The literature demonstrates a growing need to study the influence of movement in the practice and development of physical therapists (Edwards et al., 2006; Skjaerven, Kristoffersen, & Gard, 2007; 2010). Much of the study to date has focused on the ability of physical therapists to examine and understand the movement, both normal and pathologic, of patients. In addition, studies have focused on how movement is involved in the teaching and learning process of the therapist-patient relationship. Skjaerven et al. (2007) through a phenomenological approach were able to better understand how an awareness of the therapist's own movement may promote better movement quality in his or her patients. "The ability to be mentally and physically attentive, here and now, was considered to be the basis for professional communication. The therapist's own movement awareness was considered a precondition for observing, understanding, and promoting movement quality" (Skjaerven et al., 2010, p. 1483). The authors go on to connect this presence of mind to the learning process the patients go through. "A personal process of movement awareness learning for therapists that was similar to the process for patients provided basic support for clinical observation, reasoning, and action" (Skjaerven et al., 2010, p. 1483).

"Knowledge, especially knowledge used to solve life's ill-structured problems, may have to be constructed by the person, and this knowledge must be understood in the context in which it [is] generated" (Merriam et al., 2007, p. 333). Physical therapists face ambiguous problems every day in their clinical practice. I believe the knowledge they must create to manage these problems comes from within their professional context. It cannot always be

gained from amassing facts from external sources. Instead, the physical therapist must use movement as his or her context for creating knowledge, movement of his or her own body and of his or her patient's body. When therapists can use movement to inform their own epistemology, then, I believe, they can progress along a trajectory of development that enables them to fully embody their professional practice and learn at a higher level. I hope that future research will better inform these beliefs and that the profession of physical therapy will have a more full understanding of how movement, the concept that is so closely related with our professional practice, informs our ways of knowing and being.

Consideration of somatic learning models and their applications in healthcare reveals that learning through the body's movement may be an influential component of professional epistemological development. This concept, in combination with the importance the expertise model of physical therapy practice places on movement (Jensen et al., 2007) indicates more attention should be paid to how physical therapists integrate movement in practice as a way to enhance their knowledge and epistemological development on a pathway towards expert practice.

Professional Ways of Being

Finally, let us consider the final clinical scenario presented at the beginning of this chapter.

As the gentleman lay nearly helpless in his hospital bed, he finds himself surrounded by noisy monitors, constantly beeping and alarming the nurse of his every response to yesterday's intensive surgery. He is scared. He wants desperately to be at home with his wife. He hasn't moved since before the surgery. He knows to get home his first steps are to make it to the bathroom eight feet away. He has just met his physical therapist for the first time, and she has pledged to get him there. Something is

different about her approach. She is self-confident, but he notices how she works with the nurse, physician, and respiratory therapist who have been in and out of his room all morning. She explains in clear detail why his body, just days ago mowing his lawn, is now unable to sit up independently. He is skeptical of her abilities, but she is receptive to his concerns. He has worked with a physical therapist before which was very helpful. This woman is different. She seems, on the surface, like his other physical therapist, but she is more. It seems to him that this physical therapist must be what a true physical therapist is. He doesn't know why, but he is confident she will be able to help him, first to sit, then to walk across the room, and finally to get home to his wife.

What makes this physical therapist different? Surely her trajectory of professional development has deviated from that of her colleagues. Gloria Dall'Alba (2009b) suggests professional development occurs through a process that relies, not only on skill development and acquisition of knowledge, but also through integrating essential components of practice into an embodied existence of professional practice. The process of becoming a professional and developing expert ways of being is marked by facing and accepting various ambiguities notable to all developing professionals (Dall'Alba, 2009a).

A Third Generation Professional Development Model

As described previously, the stage model approach to professional development falls short of describing the multiple ways in which a practitioner becomes a fully embodied professional. Dall'Alba (1998; 2002; 2004; 2009a; 2009b) takes major steps towards offering a third generation approach to describing professional development and pathways to professional expertise in her studies of physicians and nurses. She argues that “a fundamental dimension of professional skill development—namely, *understanding of, and in, practice*—is overlooked in stage models...[This] forms the basis for professional skill and its development” (Dall'Alba & Sandberg, 2006, p. 388). Dall'Alba's theoretical model

of professional ways of being assumes the practitioner's understanding of how his or her professional practice integrates knowing, acting, and being (Dall'Alba & Sandberg, 2006). Through a longitudinal study of medical students' perceptions of their practice, Dall'Alba (1998, 2004) conclusively demonstrated qualitatively distinct variation between groups of the same skill level. "The different understandings are not separate parts of medical practice, but distinct ways of understanding practice" (Dall'Alba, 2004, p. 688). "Variation at a single level of skill is consistent with the notion of practice as dynamic and pluralistic" (Dall'Alba & Sandberg, 2006, p. 391).

Ontology in Ways of Being

Dall'Alba (2009a, 2009b) advocates for moving toward theoretical models of analysis that acknowledge and promote an understanding of who one is as a professional and how that self-awareness influences their ability to perform skills and integrate knowledge.

Learning to become a professional involves not only what we know and can do, but also who we are (becoming). It involves integration of knowing, acting, and being, in the form of professional ways of being that unfold over time....Through such a focus on epistemology, ontology is overlooked. (Dall'Alba, 2009a, p. 34)

Dall'Alba's framework of professional ways of being accepts that skill development over time is greatly influenced by the ability of the individual to accept and integrate ambiguities. In addition, they must understand and embody an integrated understanding of what it means to be a professional (Dall'Alba & Sandberg, 2006). Without this embodied knowing, she argues, skill progression lacks its full potential, and professional growth is stifled.

Ambiguity of Professional Development

Professional practice, by its very nature, is ambiguous. Dreyfus and Dreyfus (1986) also recognized the ambiguity inherent in practice by noting the ability of proficient and expert practitioners to operate within a wide range of scenarios without a noticeable detriment to their skill performance. This model recognizes the importance of developing an understanding of what it means to *be* the professional in a given field, rather than only perform the skill or demonstrate the requisite knowledge. Dall'Alba (2009a) argues for a theoretical model that acknowledges ambiguity along various paths to expertise. She outlines four ways a learner should attend to the ambiguity that must be considered inherent in one's professional development. The four ambiguities described are as follows (Dall'Alba, 2009a; 2009b):

- **Continuity with Change:** The developing professional retains the person they were prior to entering the profession, while at the same time becoming a new being within the context of the profession. "This folding of past into present, into future ensures continuity with change in our lives, while opening a range of possible development trajectories" (Dall'Alba, 2009a, p. 39). Students enter a professional training program with notions of what it means to be a member of that profession, these notions are dramatically refined during the formal educational program, and continually mature as the clinician develops. However, their original basis of understanding of who they would be as a member of the profession plays a role.

- **Possibilities with Constraints:** Practice traditions can both facilitate and inhibit developing professionals' aspirational ideas about how to operate within their profession. These aspirations are also influenced by the continuity and change inherent in professional development. "Our possible ways of acting and of being are constrained by the specific situations we inhabit with their history and traditions....Our own past that we carry forward also places limits on the possibilities open to us" (Dall'Alba, 2009a, p. 40). When refining ways of being professionals are shown a myriad of possibilities in practice; however, they may be constrained by their previous notions, conceptions or experiences.
- **Openness with Resistance:** Developing professionals face a constant challenge to demonstrate an openness to change but also to sustain this level of openness long enough to integrate what is learned into their new ways of being. This dichotomy is further complicated by the power relationships inherent in a professional environment. Trainees are indebted to their teachers; novice employees are subject to the opinions of mentors; experienced clinicians must face emerging knowledge better understood by their younger colleagues. "However, where there is some openness to re-thinking assumptions and mutual respect among practitioners, new ways of acting and being can come into play, bringing about a renewal of practice at both individual and collective levels" (Dall'Alba, 2009a, p. 42)
- **Individuals with Others:** The previous three conditions help demonstrate that becoming a professional is impossible in isolation. However, a profession must

embrace the individuality of its members, thus creating an interdependence on the individual and the group. “The two are interdependent and spill over into one another, as well as being entangled in the broader social world” (Dall'Alba, 2009a, p. 42)

Applications of Professional Ways of Being

Dall'Alba's theoretical framework remains relatively new and untested across a variety of domains. Her foundational work was performed with physicians (2002, 2004, 2009a, 2009b) and applied to nursing practice (Dall'Alba & Sandberg, 2006). These studies examined the experiences of students in health professions education programs and their various perceptions of professional development across their educational trajectory. In other studies, this theoretical model was applied to the design professions and found to be an effective tool for analyzing the practice differences and professional development across a range of design professions (Adams, Daly, Mann, & Dall'Alba, 2011; Daly, 2008; Daly, Adams, & Bodner, 2012).

In a study of professional nurses, an intervention group, who received education about movement awareness and patient transfers, was found to be more reflective and integrated movement awareness in their practice one year after receiving instruction. The authors of this study cited Dall'Alba's framework to describe the interplay between understanding practice and performance of skill (Kindblom-Rising, Wahlstrom, Nilsson-Wikmar, & Buer, 2011).

Larsson, Miller, Liljedahl, and Gard (2012) also cited Dall'Alba's framework as support for their qualitative phenomenographic study of physical therapists' experiences with scientific interventions for children with cerebral palsy. They found that the physical therapists' experiences "may be entrenched in the routines and ready-made solutions that permeate tradition" (p. 8). This notion supports the four ambiguities of development described by Dall'Alba (2009b), specifically the idea of openness with resistance and its propensity to stifle professional growth.

Petty, Scholes, and Ellis (2011a, 2011b) also cite Dall'Alba's (2009a, 2009b) theoretical framework of professional ways of being in their studies of musculoskeletal physical therapists involved in master's level education. They indicated that the course of study for these physical therapists led "to more complex and comprehensive embodied understanding" (Petty et al., 2011a, p. 594).

Discussion

A growing need to study the influences of movement in the practice and development of physical therapists has recently been demonstrated in the literature (Edwards et al., 2006; Skjaerven et al., 2007, 2010). Much of the study to date has focused on the ability of physical therapists to examine and understand the movement of patients and on how the therapists' awareness of his or her own movement connects with his or her ability to teach and assist his or her patient (Skaerven et al., 2007, 2010).

Despite study of the use and awareness of movement within the practice of physical therapy, little is known about how physical therapists achieve the dimensions of expert

practice outlined by Jensen et al. (2007), specifically the dimension of “movement”. In order to understand how expertise is developed within physical therapy, I contend that we must begin by understanding how these dimensions of expertise are promoted early in practice. It has been argued that the use of movement as a component skill in physical therapy is what makes our practice unique (Jensen et al., 2007; Sahrman, 1998). I argue that the use of movement in our practice is much more than a demonstration of unique and skillful practice. Along with the other three dimensions of expert physical therapy practice (Jensen et al., 2007), movement is a deeply embodied way-of-being for physical therapists.

Somatic learning theorists have proposed that learning through the body’s actions may be an important mechanism in developing epistemological understanding (Amann, 2003; Brockman, 2001; Horst, 2008). In addition, these theorists recognize the importance ambiguity plays in developing epistemology. Expert physical therapists agree that in order to achieve high proficiency in practice, a level of acceptance and comfort with ambiguity must be accepted as part of one’s professional philosophy (Jensen et al., 2007). As Dall’Alba (1998; 2002; 2004; 2009a; 2009b) argues, the embodiment of movement as a way-of-being promotes greater acquisition and demonstration of skill and knowledge toward multiple trajectories of expertise. The multiplicity of trajectories, then, is directly related to the inherent ambiguity faced in the process of developing a professional epistemology and ontology. “Attending to, and dwelling with, these ambiguities—while recognizing them as ambiguities, not simply conflicts to be resolved—can open possibilities for enriching professional education programs and making these programs more meaningful for those who

are learning ways of being...” (Dall'Alba, 2009a, p. 40). Having reviewed the pertinent literature related to professional development, Dall'Alba's ways of being model provides the best opportunity as a theoretical framework to examine how physical therapist clinical instructors utilize epistemology and ontology when perceiving the needs of their students and facilitating those students to use movement in their practice.

Clinical Instructors are poised to facilitate and readily assess the early abilities of practitioners to embody these key aspects of being a physical therapist. Studying how physical therapist clinical instructors perceive and facilitate students' use of movement in their practice will best be framed by understanding that (a) the unique use of movement in practice is a requisite for expertise in physical therapy (Jensen et al., 2007), and (b) the embodiment of movement in a physical therapist's care is best promoted as a professional way-of-being when a student is engaged with an openness to accept the ambiguities inherent in professional development (Dall'Alba, 2009b).

CHAPTER THREE

METHODOLOGY

Research Design

Little is known about the process physical therapist clinical educators engage in when facilitating use of movement in their students during clinical education. Though tools exist (Hrachovy et al., 2000; Roach et al., 2012) that attempt to standardize the assessment of students' psychomotor and behavioral abilities during clinical practice, student assessment may be influenced by many factors that are not, necessarily, reflected by these tools. Tools like the Clinical Performance Instrument (APTA, 2006c) are limited in their scope and may not address important aspects of practice such as how physical therapists use movement of their own body to assess, examine, or affect change in their patient. This study addresses a lesser-understood aspect of education and professional formation in physical therapy. This study is guided by its primary research question:

How do physical therapist clinical instructors perceive and subsequently facilitate students' development of the use of movement during clinical practice?

Students rely on their clinical instructor for information, guidance, and feedback. The clinical instructor must determine the needs of the student, find ways to create appropriate learning activities which target those needs, and assess the outcomes of these learning activities in order to progress the student's level of learning (APTA, 2012a). The dynamic between the student's learning needs and the instructor's skills and experience as an educator and clinician frame the focus of this study. The instructor influences the student in infinite

ways. This study specifically examines how the use of movement develops in students' practice. The instructor's process of identifying movement in practice, analyzing the student's use of it, and offering feedback all lead toward understanding how clinical instructors perceive and facilitate the use of movement for students beginning their professional careers.

In this chapter I provide the research design, including a description of the usefulness of Dall'Alba's (2009a; 2009b) professional ways of being as a theoretical framework, a summary of qualitative research, and situational analysis (Clarke, 2005). Next, I present the study design. Specifically, I describe in detail information about participant selection and criteria and data collection strategies. Third, I present the data analysis processes. Finally, I provide the methods for insuring rigor in the research process.

Theoretical Framework

Dall'Alba (2004, 2006, 2009a, 2009b) offers a framework that is useful for analyzing the research question. Her concept of professional ways of being (2009a, 2009b) emphasizes that professionals develop along multiple trajectories. The highest levels of professional development are only achieved along trajectories that allow full embodiment of key aspects of practice as a member of the profession. Different than other potential frameworks that describe professional development, Dall'Alba's model recognizes that professional development may occur in various ways and is influenced by the ambiguity faced by the developing professional. The Dall'Alba model accepts differences in instructor facilitation

of student movement in the face of ambiguity. Therefore, it is a valuable model for this study.

The Dall'Alba framework has been cited by healthcare researchers who sought to describe or demonstrate the interplay between professional knowledge acquisition and skill and professionalism (Kingblom-Rising et al., 2011; Larsson et al., 2012; Petty et al., 2011a). I contend that an embodied use of movement is a vital component in physical therapist practice and therefore necessary to truly achieve expert level of practice. To understand how physical therapists begin their pathways towards expertise, we must know how their instructors perceive and facilitate the formation of this embodied practice component.

As indicated, the process of an embodied professional development is achieved through multiple pathways. These variable trajectories arise, in part, due to ambiguity inherent in any professional practice (Dall'Alba, 2009a, 2009b). The ambiguity faced by developing professionals is primarily manifested in four ways (Dall'Alba, 2009a, p. 38):

- 1) *Continuity* over time *with change* in ways of being professionals
- 2) Possibilities in the ways we can be *with constraints* imposed by external influences
- 3) *Openness* in taking up possibilities *with resistance* to doing so
- 4) *Individuals* who are becoming professionals *with others* involved in that process

As students grapple with the challenges of embodying movement into their practice, their instructors must adapt to their students' needs. Dall'Alba's four ambiguities provide a framework to discuss and analyze how the clinical instructor perceives and facilitates students' use of movement. Throughout my data collection and analysis, the concepts of

professional embodiment and ambiguity influenced the methodology. These four ambiguities provided a contextual framework for developing the research protocol, interview guides, and data analysis. Therefore, I selected a research methodology that could help me understand the perceptions and actions of the instructors as they worked to develop their student's use of movement.

Qualitative Research

This study is well suited for qualitative research. Qualitative research is described as “being concerned with detailing people’s experiences and the situations in which they operate” (Fulton & Hayes, 2012, p. 682). Whereas quantitative study attempts to depict phenomena by capturing data presented in numerical format, a qualitative approach seeks to describe a phenomena or situations through analysis of the experiences of stakeholders, observation of their actions, and study of the documents that encapsulate the scenario. Through these mediums, and others, the research can offer detailed description and analysis to create new knowledge about the situation of interest (Fulton & Hayes, 2012).

In recent years healthcare professions focused more attention to the implementation of evidence-based practice. Evidence-based practice seeks to integrate the most contemporary and best knowledge about practice methodology, patient care, and outcomes into clinical practice (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996; Zimmerman, 1999). This rise in interest in practicing and educating in an evidenced-based way has called into question what counts as evidence in healthcare practice. Morse, Swanson, and Kuzel

(2001) argue passionately that qualitative research should count as evidence in healthcare research and practice.

Qualitative research has the capacity to inform clinical practice by deepening our understanding of human experience and of phenomena that exemplify that experience. It does this by creating awareness of idiosyncrasies and patterns of human behavior and by providing descriptions and theories of the process involved in becoming ill, recovering, healing and learning to cope with chronic illness, disability or frailty. (Morse et al., 2001, p. 38)

Based on these emerging discussions, the healthcare literature includes information about what can be considered proper rigor in research. Several authors have written on the qualitative research process and outlined appropriate markers of rigor in this type of healthcare research (Cohen & Crabtree, 2008; Fulton & Hayes, 2012; Ohman, 2005). In addition, several authors have described the benefits of qualitative research for rehabilitation sciences and specifically for the profession of physical therapy (Jensen, 1989; Shepard, Jensen, Schmoll, Hack, & Gwyer, 1993; Townsend, Cox, & Li, 2010). As Jensen (1989) points out, “[A] broad array of quantitative and qualitative research methods will enable us to understand the complexity and richness of the clinical and educational environments in physical therapy and contribute to the development of a theoretical knowledge base” (p. 493).

Little is known about how clinical instructors choose to facilitate this key aspect of practice. This complex area of inquiry requires understanding context and delving into tacit

knowledge. A deeper understanding of the experience of these educators can be more readily revealed through a qualitative approach. This study offers an initial understanding of how clinical instructors engage with students as they begin their pathways of professional development. By expanding the body of knowledge related to clinical instructors' perceptions, the profession can more fully appreciate the complexities inherent in helping students develop through the use of their own body's movement.

Situational Analysis

Situational analysis (Clarke, 2005) informs the research methodology in this study. Situational analysis, a constructionist derivation of grounded theory, is a qualitative methodology that allows the researcher to rely on his or her contextual knowledge of a situation in an effort to holistically collect and analyze data to produce new theoretical knowledge about the situation central to the research question (Clarke, 2005). Influenced by the acceptance of discourse and actor network theory, the focus on a central situation allows the researcher to methodically analyze the infinite actants involved. As I examine the complex and tacit nature clinical instructors use to perceive and facilitate students' embodiment of movement in practice, situational analysis allows me to focus the study on the relationship of the student and instructor. Situational analysis will also accounting for numerous other factors influencing the professional formation of the student and allowing for understanding the ambiguity expected to be faced in the process.

In this section, I first include an overview of grounded theory, situational analysis's methodological predecessor, and a description of constructionism's role in the evolution of

this qualitative methodology. I next provide an account of how discourse, actor network theory, and a central focus on the situation, all influenced by the ideals of constructivism and the postmodern movement, play a role in situational analysis. Finally, in this section, I describe how situational analysis is applied in this study.

Grounded theory as a foundation. In the preface to their book *Discovery of Grounded Theory*, Glaser and Strauss (1967) offer an approach for “generating theory rather than verifying it” (p. viii). Further, they advocate for the importance of theory verification and generation in science, which is especially helpful when theories do not exist or are not complete to explain a phenomenon that has only been observed, described, or modeled in contexts different from those of interest to the researcher (Creswell, 2007). Working from the frameworks of social interactionism, Glaser and Strauss (1967) developed a methodology to study how people understand their world through their actions with others (Fulton & Hayes, 2012).

Constructionist and postmodern evolution. The writings of Glaser (2002) take a positivist or post-positivist approach, indicating that the researcher can expect to discover a theory by solely focusing on the data without influence from other sources. Fulton and Hayes (2012) describe Glaser’s approach by saying, “[R]ather than try and organize the analysis, the researcher should collect the data and allow the theories to emerge” (p. 664). Despite its inherent inductive nature, this methodological approach “had the basic idea that there was an objective reality which could be captured” (Fulton & Hayes, 2012, p. 664).

Since the introduction of Glaser and Strauss's grounded theory methodology in 1967, social scientists realized a need for theory generation free from the constraints of a positivist paradigm. "For post-modernists, grounded theory epitomized distanced inquiry by objective experts who assumed their training licensed them to define and represent research participants" (Charmaz, 2008, p. 400).

Constructionist influences began to emerge in grounded theory processes during the late twentieth century. In their compendium on constructionist research, Holstein and Gubrium (2008) describe constructionist research as suited for the study of the "practical workings of *what* is constructed and *how* the construction process unfolds... [It] does not lend itself easily to dealing with the *why* questions that predominate in more positivistically oriented inquiry" (p. 5).

Charmaz (2008), while agreeing that there is benefit to the discovery of the "what" and "how" questions Holstein and Gubrium (2008) refer to, states that "a social constructionist approach to grounded theory allows us to address *why* questions while preserving the complexity of social life" (p. 397). For Charmaz (2008) constructionism includes the need for the researcher to examine "(1) the relativity of the researcher's perspectives, positions, practices, and research situation, (2) the researcher's reflexivity; and (3) depictions of social constructions in the studied world" (Charmaz, 2008, p. 402). Ohman (2005) further describes basic assumptions of constructionist researchers. They believe the world is complex and that people have different perspectives; the interactions of the researcher and respondent are paramount in the theory building process; and the researcher's

findings are dependent on context of the social situation bounding the study (Ohman, 2005, p. 37).

The blend of a social constructionist paradigm with grounded theory methodology lends itself to beneficial outcomes. "...When social constructionists combine their attention to context, action, and interpretation with grounded theory analytic strategies, they can produce dense analyses with explanatory power, as well as conceptual understanding" (Charmaz, 2008, p. 408-409). The debate over the proper methodology and paradigmatic view for grounded theory research has raged in the past few decades as Strauss's views began to diverge from his original partner, Glaser (Bryant & Charmaz, 2007; Charmaz, 2006; Charmaz, 2008; Clarke, 2005; Creswell, 2007; Fulton & Hayes, 2012; Strauss, 1987). Despite this, social constructionist views are pervasive in grounded theory research today. This study seeks to build a conceptual understanding of the clinical educator's perceptions when analyzing his or her students' use of movement and the subsequent facilitation of movement use. This may help explain this phenomenon as a potential basis for future theory development. Therefore, a constructivist approach to grounded theory was helpful in designing this study.

Clark (2005) advocates for advancing the process of grounded theory to more fully encapsulate the ideas of social influences on knowledge construction in her methodology termed "Situational Analysis". "Situational analysis supplements traditional or basic grounded theory with alternative approaches to *both* data gathering and analysis/interpretation" (Clarke, 2005, p. xxii)

Clark eloquently argues that the state of scientific research today is influenced by the age of postmodernity.

As part of the theoretical turn of the mid/late 20th century, postmodernism thus offers a way of describing the broadening and now relentless challenges to the Western Enlightenment, humanism, and positivist sciences as the assumed pinnacles of human achievement globally. Instead postmodern perspectives view *all* knowledge as socially and culturally produced. (Clarke, 2005, p. xxiv)

Clarke identifies attributes of traditional grounded theory and its reliance in symbolic interactionism that have hallmarks of postmodernity, but identifies areas where this process is resistant to ideals of postmodernity. These include its lack of reflexivity, oversimplification, interpretation of variation as negative cases, and a search for purity in theory production (Clarke, 2005, p. 11). Because of these concerns, Clarke (2005) advocates for further development of the methodology. She outlines six strategies for advancing this methodology into the postmodern era that form the basis for situational analysis. These are (Clarke, 2005, p. 19):

- All knowledge producers are situated in their individual contexts and embody their own “truths”.
- Analysis should be focused around the “situation” of the phenomenon.
- Acknowledge the complexities, differences, and homogeneity.
- Synthesizing and integration of concepts may be a sufficient scientific pursuit short of development of a theory.

- Situational analysis should occur throughout the process.
- Discourses allow for expanded understanding.

These strategies provide an excellent methodological framework for this study. Both instructors and students are influenced by their contexts, including but not limited to the educational program, the profession's history, the healthcare arena, and societal expectations. The clinical instructor and student's relationship focused on the embodiment of movement represents a definable situation. Education and healthcare are fraught with complexity that surely manifests in a study of this focus. Finally, the discourse present in the relationships between the instructor, student, academic program, clinic supervisors, etc., must be attended to as professional development is considered.

In addition, three major theoretical influences are noted in the formation of situational analysis. These include discourse, actor network theory, and centrality of the situation.

Discourse. Clarke identifies the work of Michel Foucault as important in the design of situational analysis. The philosophical work of Foucault has had influences in a variety of fields including medicine, law, and psychiatry (Fulton & Hayes, 2012). Of primary concern to Foucault were his ideas about discourse (Foucault, 1972). Foucault felt that dominant views in society are transmitted from person to person and from generation to generation in a variety of ways (Clarke, 2005; Fulton & Hayes, 2012). Within discourse are the inherent influences of power and agency, both of which are influenced by the social arenas surrounding individuals involved (Clarke 2005). According to Clarke (2005), such discursive influences should be considered within the study of knowledge creation and theory

development. The discourse present in the relationships between the instructor, student, academic program, clinic supervisors, etc., must be attended to as professional development is considered.

Actor network theory. Clarke (2005) also argues for careful consideration of inanimate objects in an attempt to develop theory. She identifies the importance of actor network theory, developed by an interdisciplinary group of scientists and technology experts (Latour, 1996). It recognizes the important influences objects can have on the decisions and actions of humans. As Clarke (2005) argues, “[N]onhuman actants structurally condition the interactions within the situation through their specific material properties and requirements and through our engagements with them...Situational analysis explicitly takes the nonhuman elements in the situation of inquiry into account both materially and discursively” (p. 63). This study attends to consideration of any nonhuman influences that the student or instructor reveal as influential in the process of developing the use of movement in practice.

Centrality of the situation. More traditional approaches to grounded theory frequently rely on conditional matrices formation (Strauss & Corbin, 1990) which helped focus the researcher on developing theory by organizing his or her data into society’s defined levels, at the core of which is the phenomenon or problem of study. Clarke (2005) argues against this approach, pointing out that “the conditional elements of the situation need to be specified in the analysis of the situation itself as *they are constitutive of it*, not merely surrounding it or framing it or contributing to it. *They are it*” (Clarke, 2005, p. 71). Thus,

Clarke developed a grounded theory approach that allowed for entering the researcher's focus to a given situation.

Situational analysis's application to this study. The relationship between the clinical instructor and the student form the basis for the situation of study in this research. The dynamic relationship between student and instructor enable the study of the discursive relationships that may influence how the instructor analyzes the student's use of movement in practice. It is well recognized within the profession that the use of movement is important to practice; however, there is little in the literature that describes how this develops. Therefore, situational analysis of the student and instructor relationship are ideal for answering the research question.

In addition, innumerable actors influence the clinical education environment. These can be both human and non-human, including clinical equipment, technology, printed resources, patients, their family members, and clinical colleagues. The awareness of actor network theory in situational analysis provide a framework for understanding the influences these people and objects may provide on the clinical instructor's analysis of the student.

Furthermore, the concept using movement as an embodied part of practice serves as the central focus in the situational analysis. The embodiment of movement in the professional practice of physical therapists has been recognized as an aspect of practice that otherwise may go unnoticed and discussed. In their development of a model of expert practice, Jensen et al. (2007, 2010) originally omitted "movement" as a dimension of the model. It was not until consultants from outside the physical therapy profession checked

their data that the researchers, physical therapists themselves, were made aware that movement is “the implicit dimension” of expert practice (Jensen et al., 2007). When coupled with the concepts of Dall’Alba’s (2009a, 2009b) theoretical framework of professional ways of being, situational analysis is well suited to explore how clinical instructors influence the formation of professional embodiment early in the development trajectory towards expertise.

Grounded theory studies and situational analyses seek to generate new theory through a process that thoroughly and completely gathers and analyzes data simultaneously (Charmaz, 2006; Glaser & Strauss, 1967). This process involves iterative cycles of data collection and analyses with the goal of complete saturation before conclusive findings are presented. Given the time and resource constraints inherent in a dissertation, this study adapts Clarke’s (2005) situational analysis, based on the grounded theory concepts of Charmaz (2006). This study is not designed to reach saturation, as called for by Charmaz (2006) and Clarke (2005). Instead, the aim is to complete a comprehensive foundational round of data collection and analysis that will serve to inform and influence future iterations of this study until saturation is reached.

Study Design

For this study I achieved 40.5 participant contact hours for data collection, which were a combination of interviews and observations (see Table 3.1). This represents a high number of contact hours for a dissertation of its kind. Because this study examined the tacit nature of clinical instruction and professional practice, it was important for me to spend more time with each individual participant. This provided data that deeply reflects experience and

practice through interviews and observation. I interviewed 5 instructors and 5 student participants for approximately one hour each at the beginning and again at the end of the study period. I conducted three approximately 90-minute observations of each participant pair for a total of 20 hours of observation. In addition, I reviewed the participants' midterm and final Clinical Performance Instrument (APTA, 2006c).

Table 3.1. Contact Hours During Participant Interviews and Observations

	Total Participant contact hours
Student Interview 1	4.5
Student Interview 2	6
Instructor Interview 1	5
Instructor Interview 2	5
Observations	20
Total Contact Hours	40.5

Participant Selection

I selected participants using a criteria based purposeful sampling strategy. Purposeful sampling is defined as the researcher's use of a set of specific criteria to select a sample (SAGE Publications, 2006). This strategy is beneficial when the researcher knows specific informants who can provide the detailed information needed to study the research question (Sage Publications, 2006). As an Associate Director of Clinical Education (DCE) I was well

connected with facilities that frequently offer clinical education experiences for physical therapist students. Each of these facilities had a staff member, the Center Coordinator of Clinical Education (CCCE), who provided valuable information about clinical instructors who met the participant criteria described below.

Participant Criteria

Participants identified met several basic criteria. First, I required that selected participants were the primary instructor for a DPT student on an internship in the second or third year of his or her academic program. Next, I required participants be licensed physical therapists with at least seven years of clinical experience. Researchers studying expertise in physical therapy practice also used seven years' experience as a minimum for study participants (Jensen et al., 2000). Though I was not seeking to study expert practitioners, recruiting participants with seven years of experience in their field served to provide deeper context from which the participants could draw during their interviews.

In addition, I recruited clinical instructors who had experience and longevity in clinical instruction. No literature could be found which described specific thresholds for determining experience in physical therapist clinical instructors. However, Buccieri et al. (2006) found a relationship ($p < 0.001$) between high self-reported effectiveness and age, years in practice, years as an instructor, total number of students supervised, and participation in the APTA credentialing process for clinical instructors. In a qualitative ethnography of exceptional clinical instructors, Mostrom (2013) used participants that had been recognized through a peer-nominated process for their excellence in clinical teaching. This group of 17

participants ranged in years of practice from 3 to 32, had a range in experience as an instructor from 2 to 28 years, and had taught between 3 and 20 students. This demonstrated that excellence in clinical education may be impossible to define in strict quantitative terms.

Based on the findings described above by Buccieri et al. (2006) and Mostrom (2013), I required that participants had been a clinical instructor for at least two years and supervised at least three students prior to this study. Additionally, all participants had completed the APTA Credentialed Clinical Instructor Program (APTA, 2015c). This voluntary program provides 15 hours of continued education to physical therapists seeking to further their understanding of pedagogy, student management, and supervision issues germane to the contemporary clinical education environment. By recruiting participants that had completed this standardized credentialing program, a common language for physical therapy clinical instruction existed.

Finally, for inclusion in the study, the clinical instructor's student also had to agree to participate. There were no specific inclusion criteria for the student, otherwise. The timing and sequence of the interviews and observations were of minimal impact to the student's role as a learner in clinical education.

To summarize, the participant selection involved:

- Purposeful sampling
- Nomination from Center Coordinators of Clinical Education at geographically convenient teaching medical centers.

Instructor participant criteria included:

- Seven years of experience as a licensed physical therapist.
- Primary clinical instructor a student on an internship in his or her second or third year of his or her academic program
- Completion of the APTA Credentialed Clinical Instructor Program (APTA, 2015c)
- Two years of experience as a clinical instructor.
- Supervision of at least three students prior to the study.
- Agreement from the instructor's student to participate in the study.

Student participant criteria included:

- Participation of his or her clinical instructor.
- No criteria exist other than agreement of the student to participate by virtue of his or her instructor's selection for participation in the study.

IRB approval for the study was obtained from three large health systems in North Carolina who have a focused teaching mission. These facilities were Duke University Health System, University of North Carolina Health System, and Vidant Medical Center. I contacted the CCCEs of those programs and asked for referrals of clinical instructors who met the criteria discussed above. Across the three health systems, CCCEs identified 12 potential instructors. I performed a brief telephone-screening interview (see Appendix A), with each of the nominees. Four nominees did not meet the inclusion criteria. One nominee declined to participate. Of the remaining seven, I selected participants who reflected diversity in practice setting, clinical specialty, and who demonstrated an ability to discuss the

concepts of movement in practice. Since discussion of one's use of movement in practice relies on tacit awareness, I selected people in the screening process who were able to articulate their use of movement in practice in order to ensure rich data. I also selected participants from a wide range of practice settings given that movement use may vary depending on the setting type and specialty. Practice settings included inpatient rehabilitation, acute hospital care, and ambulatory care. Clinical specialty areas included neurology, pediatrics, and general patient care. I contacted the selected instructors' students and asked them to consider participating in the study. All of the five instructors' students agreed to participate. I completed informed consent for each student and instructor.

Data Collection Strategies

As identified throughout this dissertation, the use of movement in physical therapy practice is well recognized but poorly defined. Movement as an embodied part of practice should be recognized as tacit knowledge. The data collection process described herein was meant to enable the participant to reveal his or her tacit understandings of movement in his or her own practice as well as in that of his or her students. Mulder and Whiteley (2007) describe factors that should be considered when collecting data that emerges from tacit sources. Their recommendations include using a common vocabulary, a bounded environment, and establishing an understanding of the purpose for which the knowledge, in this case the use of movement, is acquired.

In this protocol, I ensured a common vocabulary in several ways. As a physical therapist myself, I had an intimate understanding of the terminology used by participants. I

recognized how their words indicated their tacit knowledge about movement. Further, I structured interview guides to provide a generalized vocabulary germane to all physical therapists. In addition, peer debriefing allows a researcher to check his or her methodology or analysis with knowledgeable sources that are not engaged in the research (Creswell & Miller, 2000). I used peer debriefing with all interview guides (see Appendices A-C, E, and F). Prior to data collection, experienced physical therapy academicians and clinical instructors reviewed the interview guides to ensure the language was appropriate and the interview process was conducive to facilitating data collection about the use of movement in practice.

As discussed previously, a bounded system is useful to collect data related to tacit knowledge (Mulder & Whiteley, 2007). Likewise, situational analysis demands an identified scenario central to the data collection process (Clarke, 2005). Data collection in this study was bounded by the students' internship period. The internship period provided the boundaries for when interviews and observations occurred. In their grounded theory study of physical therapy expertise Jensen et al. (2008) were faced with a similar problem of gathering rich data about a tacit subject. These authors bounded their study around the episodes of care with the expert's patients.

With these concepts in mind, data collection occurred in a way that facilitated discussion and demonstration of the participants' tacit knowledge about movement. For data collection, first, I conducted two separate interviews with the clinical instructor and student, each approximately 60 minutes in length. Next, I conducted 90-minute observations of the

instructor and student working together at the beginning, middle, and end of the internship. Following the internship, I conducted two interviews with the clinical instructor and student, approximately 90 minutes in length. Finally, I collected data using document analysis of the Clinical Performance Instrument (APTA, 2006c).

Initial participant interviews. The first 60-minute interviews were scheduled prior to the end of the second week of the internship. During this interview I introduced the research question and protocol to the participants. I focused the interview with the instructor upon his or her practice experiences, perceptions of the use of movement in his or her own practice as well as his or her students, his or her previous experiences as a clinical instructor, and his or her previous experiences analyzing and facilitating their students' use of movement in practice. The interview with the student concentrated on his or her perceptions of using movement in practice, previous experiences as a student, and previous experiences learning to use movement.

The interviews were based on a semi-structured interview guide. (see Appendices B and C). Semi-structured interviews allow the researcher to gather intended data, while also allowing freedom to discuss issues or topics brought up by the participant that may not have been considered previously by the researcher (Doody & Noonan, 2013). Since situational analysis seeks to generate new theoretical findings, it was crucial that the interview protocols allowed for flexibility to discuss aspects of movement use in practice not considered by the researcher. This freedom in structure allowed me to delve into participants' tacit knowledge with follow-up questions pertaining to specific topics referenced by the participant.

As the intent of this situational analysis was to collect rich and reflective data, the main focus of the interview included open-ended questions which sought to elicit reflection about the participants' own experience (Charmaz, 2006). I maintained an interview style consistent with Charmaz's (2006) description of "Intensive Interviewing" for grounded theory data collection.(pp. 25-26) This style of interviewing is ideal for grounded theory because it allows the researcher to assume "more direct control of the construction of data than most other methods" (Charmaz, 2006, p. 28). This allows the researcher to engage in the process of discovery early in the data collection and prevent the tendency to follow his or her preconceived ideas about the topic. This approach is conversational in nature. In conversational interviews, which are not rigid in structure, participants are encouraged to share genuine feelings and experiences about the subject matter (Wimpenny & Gass, 2000). Furthermore, portions of the guides were meant to elicit conversation specific to the theoretical framework chosen and described above.

I held interviews at a location agreeable to the participants. I audio-recorded and transcribed them verbatim. During the interview, I took notes that assisted me in reflecting and interpreting the interview later. Immediately following the interview, I completed research memos including information on the participant's response to the questions, my own thoughts about the participant's responses, and my questions for further consideration.

Participant observations. I was present for three face-to-face observations of the clinical instructor participant working with his or her student. The initial observation was within the first two weeks of the internship period. The second observation occurred during

the middle two weeks of the internship. The third observation occurred within the last two weeks of the internship. The protocol assumed that the student might need different kinds of assistance during the early, middle, and late stages of his or her internship. Therefore, I observed the instructor facilitating the use of movement in practice at different stages of the student's learning process.

Though I was present during the video recorded observations, I was not actively involved with the participant. This style of data collection is termed non-participant observation which allows for a more objective approach since the researcher is not, themselves, engaged in the process being observed while allowing the researcher to study human interaction as it occurs (Caldwell & Atwal, 2005). This form of observation has been described as particularly useful in healthcare when combined with videography (Caldwell & Atwal, 2005; Jensen et al., 2007; Latvala, Vuokila-Oikkonen, & Janhonen, 2000). These authors have indicated that non-participatory observation in conjunction with video further ensures credibility by allowing the researcher to review, as many times as they wish, what actually happens versus what they remember happening. As discussed earlier, this form of methodology is especially effective in eliciting rich data when used in conjunction with follow-up interviews in which the participants are shown video segments from earlier observations (Jensen et al, 2007).

Each observation in this study was approximately 90 minutes in length. Participants were asked in advance to suggest a time when they would be actively engaged in instructing the student during patient care. During the observation, I paid particular attention to the

participants' interactions, the ways in which the instructor engaged the student about using movement in practice, how he or she provided feedback about the student's use of movement while interacting with the patient, and the student's reaction to the instructor's input. To guide the data collection during the observation, I completed an observation matrix (see Appendix D). Dall'Alba's (2009a, 2009b) concepts of professional ways of being, including embodiment and ambiguity, provided context for the observation matrix. During observations, I noted any actions by the instructor or student that fit within the ambiguities described by Dall'Alba or demonstrated an embodied use of movement. Following each observation, I reviewed the matrix and wrote research memos. While reviewing my notes and matrices, I focused on finding exemplar moments reflective of Dall'Alba's framework (2009a; 2009b). All observations focused on the clinical instructor and student working together while caring for patients in a clinical setting. The instructor and student were the focus of all data collection. No identifying information about patients, beyond their video recorded images, was collected.

Final participant interviews. I scheduled separate 60-minute interviews with the instructor and student following the completion of the internship. These interviews focused on the participants' reflections on their experiences during the internship. (see Appendices E and F) During these interviews, I showed the same selected video clips from the recorded observation sessions to the clinical instructor and student. This method of "self-confrontation", using video segments during an interview, allows the participant to offer "insight not only into reflected and self-monitored interpretations of one's own influence but

also into influences of which one is not aware and which become visible in the course of action monitored by the researcher from outside...” (Young, Valach, Dillabough, Dover, & Matthes, 1994, p. 168). In their study of expert physical therapists, Jensen et al., (2008, pp. 315-314) remarked that the use of video playback of the therapists at work was a key factor in opening the dialogue about their tacit knowledge when working with patients. By showing these clips, I intended to help the participants describe their decision-making process and elucidate some of the tacit qualities used to facilitate the use of movement.

Like the first interview, this interview was semi-structured with open-ended questions and utilized an intensive interview approach (Charmaz, 2006). I also audio recorded and transcribed verbatim the second interview and journaled immediately thereafter.

Document analysis. Following the internship, I reviewed the participants’ Clinical Performance Instrument (CPI). The CPI (Roach et al., 2012) is the common tool used nationwide to assess student physical therapists’ clinical performance. The tool includes 18 performance criteria. Performance is assessed using an ordered categorical scale with six defined anchors (Roach et al., 2012). Anchors in this scale are “defined in terms of amount of supervision required, quality and consistency of performance, complexity, clinical reasoning ability and percentage of a full-time physical therapists’ caseload (Roach et al., 2012, p. 417). The clinical instructor rated the student and provided comments on each of the 18 criteria. In addition each clinical instructor provided comments on the student’s generalized strengths, weaknesses and areas for further development. Likewise, the student self-assessed on the same items. The CPI does not overtly require comment on the use of

movement in practice. I performed a thorough document analysis of each CPI, including all comments by the instructor and student.

The previous interviews and observations provided important context for the analysis of the CPI. This context was important when using document review in a situational analysis so that the researcher does not over assume why participants' responses are being written as they are (Charmaz, 2006).

Summary of Data Collection Phase

I utilized Dall'Alba's professional ways of being (Dall'Alba, 2009a, 2009b) to inform the creation of all interview guides and the observation matrix. I focused my questions on the instructors' embodiment of movement in their practice and their perceptions on analyzing that embodiment in their students' practice. Additionally in the student interviews, I focused on their experiences integrating movement into their practice. By using this framework in semi-structured interviews, I ensured these topics were discussed yet also allowed for the participants to provide information about how movement plays a role in practice in ways that may not be included in Dall'Alba's (2009a, 2009b) framework. In addition, I structured the observation matrix to help recognize demonstrations of embodiment and perceptions of ambiguities in students' practice.

In summary data collection proceeded as follows (see Figure 3.1):

1. Recruitment and screening of participants (see Appendix A)
2. Interview 1 – 90 minutes prior to the end of the student's second week in the internship. (see Appendices B and C)

3. Observation 1 – 90 minutes prior to the end of the student’s second week in the internship. (see Appendix D)
4. Observation 2 – 90 minutes scheduled during the middle two weeks of the internship. (see Appendix D)
5. Observation 3 – 90 minutes scheduled during the last two weeks of the student’s internship. (see Appendix D)
6. Interview 2 – 90 minutes scheduled after the completion of the internship (see Appendices E and F)
7. Clinical Performance Instrument (APTA, 2006c) document review following the internship

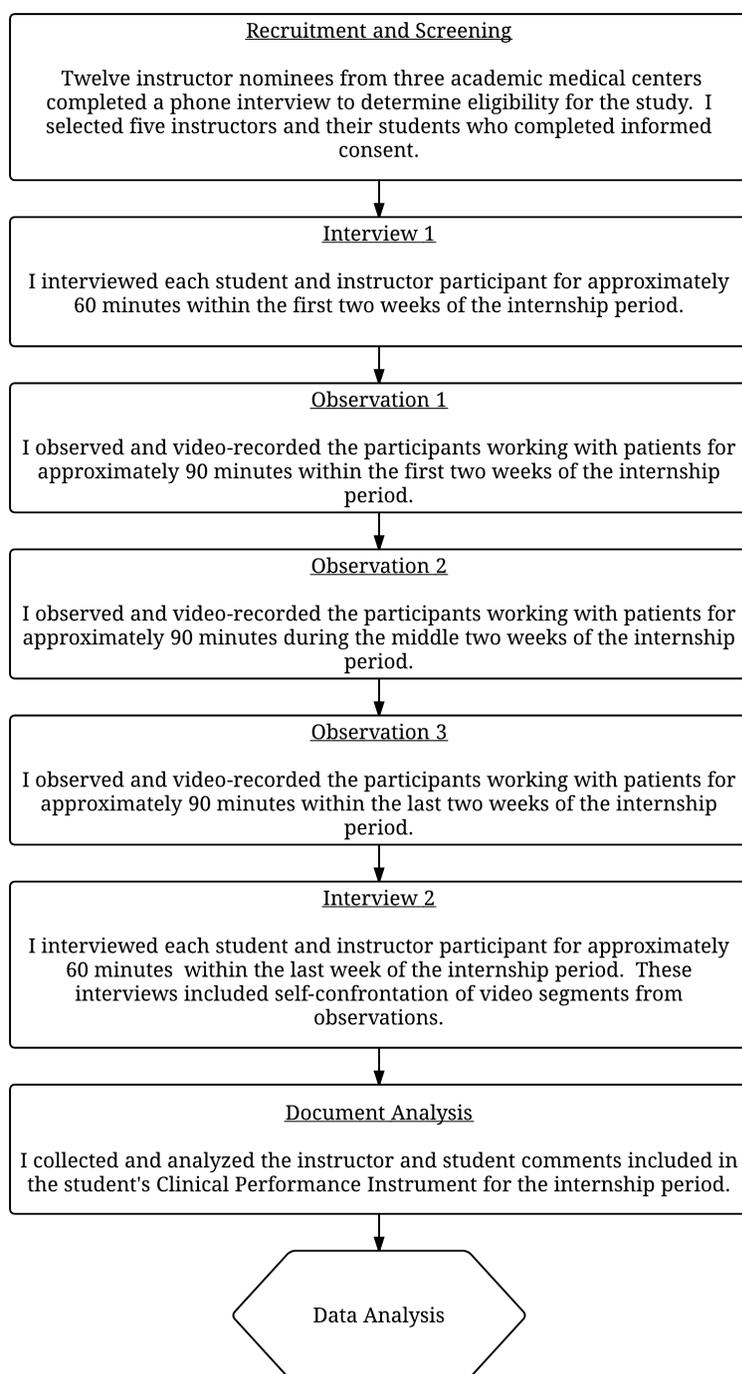


Figure 3.1. Data Collection Process

Data Analysis

There are four recognized phases of analysis in qualitative research. These include: (a) defining the analysis, (b) classifying data, (c) making connections, and (d) conveying the message (Baptiste, 2001). These phases are considered to be continuous and interdependent, meaning the researcher must assume that all phases influence each other. Therefore, Baptiste (2001) argues that these four phases are not to be taken only in order, but instead the researcher may need to return to any one of the stages while working in another. Baptiste's (2001) concept of qualitative data analysis being an iterative and continuous process is in keeping with the concepts of grounded theory (Charmaz, 2006) and situational analysis (Clarke, 2005), employing research techniques that are iterative and in which the researcher is encouraged to constantly simultaneously collect data while analyzing the findings.

Baptiste's (2001) first phase, "defining analysis", is a process in which the researcher determines his or her goals for analysis. As discussed previously, the embodied and tacit nature of using movement in physical therapy practice demanded a comprehensive and holistic approach to data collection and analysis. Situational analysis builds upon a constructivist approach to grounded theory by allowing the data analysis to acknowledge complexity, discourse, and the reflexive nature of the researcher in the analytic process (Clarke, 2005). Therefore, my goal in analyzing data in this research study was to, at all points, carefully consider the complexity, discourse, and my reflexivity in order to draw out the tacit nature of the subject. Memo writing assisted in this goal during data analysis. Throughout data analysis, I adhered to the recommendations of Charmaz (2006) and Clarke

(2005). “Memo-writing constitutes a crucial method in grounded theory because it prompts you to analyze your data and codes early in the research process, . . . keeps you involved in the analysis and helps you to increase the level of abstraction of your ideas” (Charmaz, 2006, p. 72). Memo writing enabled better reflection upon the data and provided an ongoing record of the decision-making processes used throughout all aspects of analysis.

Coding

The second stage of qualitative analysis is for data classification in which the data is first “tagged” and then “grouped” (Baptiste, 2001, n.p.). I tagged, or coded, all interview transcripts, observation matrices, and documents, following the procedures outlined by Charmaz (2006) using NVivo 10 qualitative coding software. Charmaz (2006) calls for “initial coding” in which the data is explored line by line, and the subject or action is identified by a descriptor. During this phase the researcher is to remain open and unguided, studying the data from a perspective as free from bias and prejudice as possible (Charmaz 2006). As the researcher begins to group the data, focused coding is used. During focused coding, “the most significant and/or frequent codes are used to sift through large amounts of data. [The researcher makes] decisions about which initial codes make the most analytic sense to categorize [the] data incisively and completely” (Charmaz, 2006, p. 57).

I completed initial coding on one complete set of participant data, including all student and instructor transcripts from interviews 1 and 2, all observation matrices, and a document review of the student’s CPI. Following this initial coding, I performed a thorough review of the code book (see Appendix G) and removed redundant codes. Focused coding

then proceeded in series from each set of participant data. Following each set of participant data, I completed another review of the codes to reduce any redundancy and refine the definitions of each code as needed.

Mapping Strategies

In the third phase of data analysis the researcher makes connections in an effort to construct stories and theories (Baptiste, 2001). Clark (2005) offers three distinct approaches or mapping strategies for analyzing the data from a situational analysis perspective. As she points out, these mapping strategies “are not necessarily intended as forming final analytic products...[T]he major use for them is ‘opening up’ the data and interrogating it in fresh ways within a grounded theory framework” (Clarke, 2005, p. 83). Furthermore, Clarke (2005) advocates for these “analytic exercises” (p. 83) to be used in conjunction with the traditional grounded theory methodological recommendations for coding as discussed by Charmaz (2006), Glaser & Strauss (1967), and Strauss and Corbin (1990). Clarke (2005) also calls for simultaneous memo writing during the mapping processes in order to best reflect upon the process and potential discoveries. Finally, Clarke (2005) emphasizes the need for the researcher to involve his or her own experiences in the analytic process. Using one’s own knowledge and expertise allows the researcher to “attempt to articulate what [is seen] as the *sites of silence* in our data” or “what seems present but unarticulated” (p. 85). These mapping strategies proved useful as I analyzed the data from this study and used the codes to form stories and construct new theories. In this study, the maps allowed for exploration of the central context of “movement”. The maps also allowed me to examine the

application of Dall’Alba’s (2009a, 2009b) professional ways of being framework to the situation.

Situational maps. This first strategy offers a method “for articulating the elements in the situation and examining relations among them (Clarke, 2005, p. 86-90). In this stage, all human and nonhuman actants in the situation should be listed. Not all of them may remain important to the analysis, but any influences identified should be included. These maps may take an unorganized format and may transition into an orderly listing of categorical influences. Categories of organization for the situational maps are derived from the unique circumstances of the phenomenon of study.

After all factors are identified and categorized, “relationships of all the key players are mapped against each other” (Fulton & Hayes, 2012, p.666). This allows the researcher to begin to analyze the relationships that exist between any and all factors that influence the situation. The researcher can ensure that the situational maps are complete once they have reached a state of saturation (Clarke, 2005).

When creating situational maps, I utilized all coded data and reviewed my memos to provide guidance for maps that would be both informative and provide clarification of the data. In the first situational map I utilized Dall’Alba’s (2009a, 2009b) professional was-of-being framework to examine the influences of ambiguity in learning movement and the concept of embodiment in the coded data. Next, I utilized situational mapping to categorize the clinical instructor’s teaching strategies and intended outcomes as revealed by the coded

data. Finally, I used a relational situational map to indicate the influences the various actants had on one another as students learned to use movement.

Social worlds or arenas maps. This analytic strategy derives from the influences of symbolic interactionism by focusing on “meaning-making social groups...and collective action” (Clarke, 2005, p. 109). This level of analysis allows the researcher to bring his or her focus above the individual levels analyzed via the situational maps and consider the sociologic influences of collective action, various social worlds at play in the study subject, and what groups (human or nonhuman) are participating or choosing not to participate, and why (Clarke, 2005, p. 110). “Clarke refers to this as an exploration at the meso-level, it is at this stage the discourses are further deconstructed and established (Fulton & Hayes, 2012, p. 666). The idea of a meso-level of analysis allows the researcher to consider influences at play between the micro-level where individual relationships play a role and a macro-level of encompassing theory.

In my study, it was important to consider the clinical instructor’s perceptions of his or her student’s use of movement from a meso-level to understand what other influences are at play in this relationship. In this study, it was beneficial to examine how the university, clinic, licensing body, professional associations and colleagues play a role in the interactions between the student, patient, and clinical instructor. These relationships and influences were revealed through the process of generating social worlds/arenas maps

Positional maps. Positional maps provide a graphical representation of “the major positions *taken in the data* on major discursive issues therein—topics of focus, concern, and

often but not always contestation” (Clarke, 2005, p. 126-127). Different from traditional grounded theory that identifies variant data as negative cases, positional maps allow the researcher to identify all stances reflected in the data. These maps represent positions found in the discourse, not the opinions of individuals or groups. This provides opportunity to acknowledge the various positionalities encountered in the data, free from being bounded by the ideals of individuals or groups involved in the study.

These maps are often drawn along axes that represent divergent and dichotomous views. Therefore, the four ambiguities presented in Dall’Alba’s (2009a, 2009b) framework may provide excellent bases for mapping the positional perspectives revealed in the data. Though all of the mapping strategies offered by Clarke (2005) have great potential to provide important insight during the analysis of data, the positional maps match well with Dall’Alba’s dichotomous ambiguities.

The dichotomous nature of Dall’Alba’s (2009a, 2009b) stated ambiguities provided an excellent framework for creating positional maps which demonstrated the different discourses in the data around how movement use is facilitated between the clinical instructor and the student. Each of the four ambiguities described by Dall’Alba were used in separate positional maps. Additionally, I frequently encountered three discourses while examining data. Positional maps also provided an effective way to analyze these various opinions. Students and clinical instructors often described their thoughts on the benefits and challenges of learning to use movement in action as an exercise in trial-and-error or something they learned by carefully watching their mentor and trying to mimic what they had seen. Students

frequently grappled with the notion of learning movement by watching their instructor's hands or by watching the patient's response. Finally, there was an important discourse around the association of clinical instructors' perceptions about students' demonstrated use of movement and the instructors' perceptions of students' embodiment of movement. Positional mapping provided a succinct analysis of each of these discourses.

In summary, following the recommended methodology of situational analysis (Clarke, 2005) I created the maps listed below to analyze the data:

1) Situational Maps

- a. Concepts of Dall'Alba's (2009a,b) Ways of Being: Embodiment and Ambiguities
- b. Clinical Instructor's Facilitation of Students' Development of the Use of Movement
- c. Facilitation of Movement Use Relational Analysis

2) Social Worlds / Arenas Maps

- a. Facilitating Movement Use in The Physical Therapy Professional Arena

3) Positional Maps

- a. Facilitating Movement Use by Learning in Action vs Learning by Mimicking
- b. Facilitating Movement Use by Observing the Instructor's Hands vs Observing the Patient's Response
- c. Instructors' Perceptions of Students' Ability to Use Movement vs Students' Embodiment of Movement

- d. Influence of Continuity and Change in Facilitating the Development of an Embodied Use of Movement
- e. Influence of Constraint and Possibility in Facilitating the Development of an Embodied Use of Movement
- f. Influence of Resistance and Openness in Facilitating the Development of an Embodied Use of Movement
- g. Influence of Individuals and Others in Facilitating the Development of an Embodied Use of Movement

Detailed analysis of each map is provided in Chapter Four.

Project maps. After the researcher has applied his or her data to the three mapping strategies, an encompassing project map may be created. The project map draws on the work of the other three maps and coding and traditional diagramming that may have occurred in the methodological process (Clarke, 2005, p. 137). Project maps, therefore, are “no longer maps furthering one’s own analysis but instead are maps tailored to explicate particular aspects of a specific project to intended audiences” (Clarke, 2005, p. 137). The project map allows a graphical representation of the analytical findings of the other three mapping strategies and serves as a tool for summarizing the situation of study. At the end of data analysis, I produced project maps that summarize the research question findings. These maps are presented in chapters five and six.

Issues of Rigor

Many authors have argued for the importance of ensuring rigor in qualitative inquiry (Cohen & Crabtree, 2008; Guba & Lincoln, 1982; Morse, Barrett, Mayan, Olson, & Spiers, 2008; Silverman, 2001). It is often the case in healthcare research that quantitative studies are performed from a positivist perspective and issues of rigor are discussed in terms of reliability and validity (Cohen & Crabtree, 2008). Given that qualitative research arises from paradigms that allow for researcher discovery through engagement with the subject, interpretation, and reflexivity, issues of rigor must be addressed differently (Cohen & Crabtree, 2008; Guba & Lincoln, 1982; Guba & Lincoln, 2000). To ensure rigor in my study, I chose to focus on two aspects of the qualitative research process outlined by Guba and Lincoln (1982). These are credibility and dependability, which from the quantitative perspective are corollaries of internal validity and reliability respectively. Both of these issues have been cited as crucial aspects of qualitative research that must be soundly demonstrated in healthcare research (Cohen & Crabtree, 2008).

Credibility

Credibility in qualitative research helps ensure that the researcher's analysis matches the information from the sources of data (Guba & Lincoln, 1982). I used situational analysis mapping strategies as a mechanism to reflect the statements, actions, and writings of my participants.

Shenton (2004) suggests that credibility of qualitative research is strengthened when the researcher develops a familiarity with the culture or organization being studied. As a

physical therapy academician and clinician, I have intimate awareness of the professional culture of clinicians and students. This familiarity ensured accuracy of data reporting since I was familiar with the language and actions of participants within their professional contexts. Additionally, the contact hours produced through the interviews and observations allowed for data collection and analysis consistent with the methodological framework chosen, which ensured enough familiarity with the subject to produce credible outcomes.

Utilizing appropriate methodology for the context and research question also lends credibility (Shenton, 2004). As previously discussed, my methodology was heavily influenced by the work of Jensen et al. (2007) who studied expertise in physical therapy through a grounded theory approach. Like the work of Jensen et al. (2007), I chose to use a staggered mixture of interviews and non-participant observations. Jensen et al. (2007) cited this methodology as highly effective in allowing participants to express their tacit knowledge, while also lending credibility to the researcher's data by reducing researcher assumptions.

I also promoted credibility through triangulation. This allows various sources of data to be compared to each other for convergence of information (Creswell & Miller, 2000). By comparing the data in this way, I ensured that the participants revealed similar concepts in multiple formats and at different times. By collecting data via interview, observation and document data from each subject, it was easy to triangulate information from multiple sources and determine if the data was consistent.

Finally, I ensured credibility in my research by using member checks. Member checks offer an opportunity for participants to reaffirm their comments and ensure that the data conveys, in fact, what the participant meant to convey (Creswell & Miller, 2000). Following the transcription of each interview, I mailed participants a copy of their interview and allowed them the opportunity to make any corrections. Though some find fault in using member checking as a method of ensuring credibility because it relies on the participant's memory for stability, the benefit of allowing a participant to review transcripts still ensures his or her agreement with the interview data, despite if his or her memory of the event has changed or not (Morse et al., 2008).

Dependability

Dependability helps ensure that data and analysis demonstrate consistency (Guba & Lincoln, 1982; Shenton, 2004). The primary aim of dependability is to ensure that the research process adheres to strict methodological processes and if changes must be made at any point, decisions are intentional, recorded, and reflected upon to ensure the change was effective (Shenton, 2004).

Guba and Lincoln (1982) advocate for a "dependability audit" (p. 248). To ensure dependability in the research process, I maintained a detailed log of the data collection methodology. This log noted the timing of all events and any derivation from the protocol, reasons for that derivation, and a reflective summary of the outcomes. This log can be made available to any external party wishing to review my decision making process during the data collection phase.

As discussed previously, memo-writing is a recommended part of the grounded theory methodology that was employed throughout the data collection and analysis phases (Charmaz, 2006). Memos were stored using NVivo 10 qualitative software and are a record, not of the process, but of my thoughts. This allows for auditing from the dissertation committee or university officials if a question of research dependability arises.

Limitations and Strengths

Limitations. The primary limitation of this study was the small sample size. In an effort to provide greater depth of experience with individual participants and focus upon the situational analysis, the data design utilized fewer participants for greater amounts of time. As discussed previously, the five participants were intended to represent the first round of purposeful sampling that may lead to subsequent rounds until data saturation. Though the participant pool is small in this study, this was offset by the timing and sequencing of interviews and observations. By sequencing the interviews at the beginning and end of a ten to twelve week internship period, the protocol ensured stability of participants' opinions, allowed reflection of gathered data, and used video observation to provide validity in the final interview session.

Another limitation of this study was the complex nature of the research topic. For an in-depth and valuable exploration of clinical instructors' perceptions and facilitation of students' use of movement, the researcher must be able to elicit responses that acknowledge the participant's tacit knowledge and embodied actions. Once again, the methodology of the study sought to offset this limitation. The focus of the first interview was to help participants

explore their own thoughts, biases, and experiences with using movement in practice and facilitating its use with students. By having this conversation at the beginning, the participants were more aware of this tacit aspect of their practice early on. Furthermore discussing scenarios witnessed during the observations allowed the participants to consider their thoughts, actions and decision-making process, thereby explaining their tacit and embodied notions.

Another limitation of this study may have been the regional focus on participant selection. Though an effort was made to have a participant pool with varied practice experiences, the regional nature of the sample of convenience may mean that data is only reflective of practice in the southeast region of the United States.

Finally, the inexperience of the researcher was a limitation in this study. This was the first time I have designed and implemented an independent qualitative research study. In order to produce an effective research product, my junior experience in performing effective qualitative interviews, observations, and document reviews had to be overcome. Though I had no experience performing a qualitative research study of this magnitude, my coursework and experiences as a student helped prepare me for this study. I had not only participated in the program's "Qualitative Data Collection" course, but also acted as Dr. Susan Barcinas's teaching assistant for this course. The experiences as a student and teaching assistant prepared me to understand how to perform effective data collection for a research protocol such as mine. I offset this limitation during the study through constant communication with

my chair and committee, seeking their input at all times to ensure my data collection and analysis methods were sound.

Strengths. To study the tacit nature of how physical therapist clinical instructors facilitate an ill-defined component of practice in their students can only be done by an insider. As a physical therapist, my subjectivity and positionality were an asset in this study. I understood the participants' motives, language, and actions. I was able to build instant rapport with the participants because of our common professional experiences as clinicians and clinical instructors.

In recognizing the importance of my experiences for this study, I chose a design that allowed me to draw upon my own experiences in the data collection and analysis. Situational analysis (Clarke, 2005) accepts the researcher as a source of information and a valuable influence in the analytic process. Without my knowledge and experience as a physical therapist, the use of this methodology would have been ineffective.

Another strength of this study is the holistic approach the methodology allowed. Situational analysis (Clarke, 2005) accepts that considering a vast array of informational sources influential to the situation of study should generate new knowledge. The protocol used multiple methods of data collection and analysis which allowed for a complete approach to studying the use of movement in practice.

A final strength of this study was the depth of participant exposure. The protocol called for participant exposure during interviews, observations, and document review with five instructors and five students. This extended experience allowed for understanding the

nuances each participant reveals related to the subject of study. A study of this nature could only be successful if the protocol allowed the researcher time to enable the tacit understandings of the participant to emerge. This research protocol allowed such an opportunity.

Ethics and Institutional Review Board

This study did not proceed without the guidance of my dissertation chair, the agreement of my committee, and the approval of the North Carolina State University Institutional Review Board (IRB). I adhered to all policies of the IRB throughout this study. All participants were provided with an informed consent prepared by the researcher. These were provided to the participants, and their signatures were obtained prior to the interviews and observations beginning. The students' informed consent allowed the use of the Clinical Performance Instrument assessment for document review. The patients' informed consent allowed for their private health care information in the form of their video recorded images and any conversations about their care, to be captured.

There was no risk for any participant involved in this study. However, to ensure no harm to any participant, all data was handled with care, and anonymity was afforded to all research participants. All data was securely stored in the researcher's office behind two locked doors. Digital data was stored on a secure and encrypted computer. To protect participants' anonymity, quotes from the research transcripts will only be identified by indicating if the comment is from a student or instructor and by identifying the practice setting.

Conclusion

Physical therapists have long recognized the importance of movement in their practice. Physical therapists are professionals who use the movement of their own bodies to help their patients improve deficits that cause difficulty in their physical function. As physical therapists develop from novice students to expert clinicians, they must learn to integrate an effective use of movement into their own practice. This unique use of movement has been noted as an aspect of expertise in physical therapy practice (Jensen et al., 2000). No studies have focused on how physical therapists develop this integrated sense of movement within their practice along a pathway towards expertise.

The pathway towards this expertise is likely highly variable and may be dependent on how effective the vital role of movement in practice is embodied into the professional's ontology (Dall'Alba, 2009b). This journey is fraught with ambiguity that must be faced and reconciled in order to progress towards a level of expertise that can embody key elements of physical therapist practice, such as the use of movement (Dall'Alba, 2009a).

This research protocol extended the work done previously which demonstrated the importance of movement as a dimension of expert practice (Jensen et al., 2000) and examined how this crucial aspect of practice is influenced at the beginning of a career trajectory. Using a situational analysis methodology, based on the foundational concepts of grounded theory (Charmaz, 2006; Clarke, 2005), I focused on the multiple relationships, actants and vital discourses that surround the relationship between the clinical instructor and student. Through careful analysis of interviews, observations, and document review, this

study revealed how clinical instructors' perceptions and subsequent facilitation of students' use of movement begins to be formed on a path towards expertise.

CHAPTER FOUR

FINDINGS

...I do think a lot of what I do with a child as being similar to a dance...So from that perspective I see [movement use] as something very dynamic, changing not just from session to session, but just within the session, moment to moment. Um, so constantly changing where I am relative to where the child is, and how the child responds to me. And um, maybe this is leaping ahead, but then acknowledging that with my students, because two dancers are different. [The student's] movement with the child may be or almost certainly will be different from mine. And that I can't necessarily say, "Put your hands here. And this is what will happen." (Instructor, Ambulatory Pediatrics)

The use of movement in the physical therapist's treatment of patients is a key component of expert practice. Helping students learn to use movement in treating patients is complex and demands thoughtful and intentional mentoring from an experienced instructor. This research study examined the intricacies of teaching physical therapist students how to integrate the use of movement into their emerging practice by addressing the primary research question:

How do physical therapist clinical instructors perceive and subsequently facilitate students' development of the use of movement during clinical practice?

To explore this question, I conducted individual interviews with five pairs of instructors and their students, observed the instructors and students working together with patients, and reviewed instructors' written assessments of their students' performance. I then used open

coding and several situational analysis strategies to analyze data. These strategies included situational mapping, positional mapping, and social worlds/arenas mapping. Each of the maps used in the research analysis will be described in detailed quotes from the data and vignettes constructed from observations and interviews.

Situational Maps

I constructed situational maps to understand the major elements of the situation of study, learning movement use in clinical practice. Likewise, the situational maps aided in exploring relationships that might exist between elements. Below, I show how I used Dall'Alba's professional ways-of-being framework to frame the first situational map. Next, I discuss a situational map of the various teaching strategies instructors used to facilitate students' use of movement. Third, I provide a relational analysis of the different actants in the situation and present a discussion of their impact on one another.

Concepts of Dall'Alba's Ways of Being: Embodiment and Ambiguities

The student is positioned in the center of a large rehabilitation gymnasium. Tasked with watching his clinical instructor, he carefully watches exactly where she places her hands on the patients and tries to determine how hard she is pressing on the weak muscles. Each time the student asks the instructor a question, the instructor pauses, reflects, and carefully considers how she uses her hands. It is as if she was not thinking about it while working with the patient. The student finds this odd since he feels he concentrates so hard every time he uses his hands to help a patient. Even more confusing for the student has been that the other therapists in the hospital use slightly different techniques to achieve a similar result with their patients.

Each physical therapist uses movement uniquely and applies it differently depending on patients' needs. Therefore, the use of movement in practice seems ambiguous, especially to the learner. Despite this variability, it is clear that at some point in the career development

of a physical therapist this use of movement becomes an embodied part of practice. In order to progress towards this level of embodiment, students must reckon with the variability they are seeing in their mentors' movement use.

There are so many different techniques to accomplish the same thing...And you could observe two clinicians in the same clinic working with the same patient at different times, and one clinician might use completely different techniques than the other one, and it comes down to the skills that they have and what they feel comfortable using.

A lot of times it comes down to the patient. (Student, Hospital Pediatrics)

In order to understand the implications of movement's ambiguity for the student learning to use movement, I developed a situational map using Dall'Alba's professional ways of being framework (2009a; 2009b). Dall'Alba proposes four categories in which ambiguity is encountered during a professional's progression towards embodiment. These are:

Continuity versus Change; Possibilities versus Constraints; Openness versus Resistance; and Individuals versus Others (see Figure 4.1). Each dichotomized ambiguity provides an organizational category for the map. Additionally, I categorized the discourse around embodiment with the ambiguities, as the two are interrelated. From the data, memos, and documents, I derived key concepts and situated them in their respective categories in an effort to examine how the instructors perceive and facilitate movement use in their students.

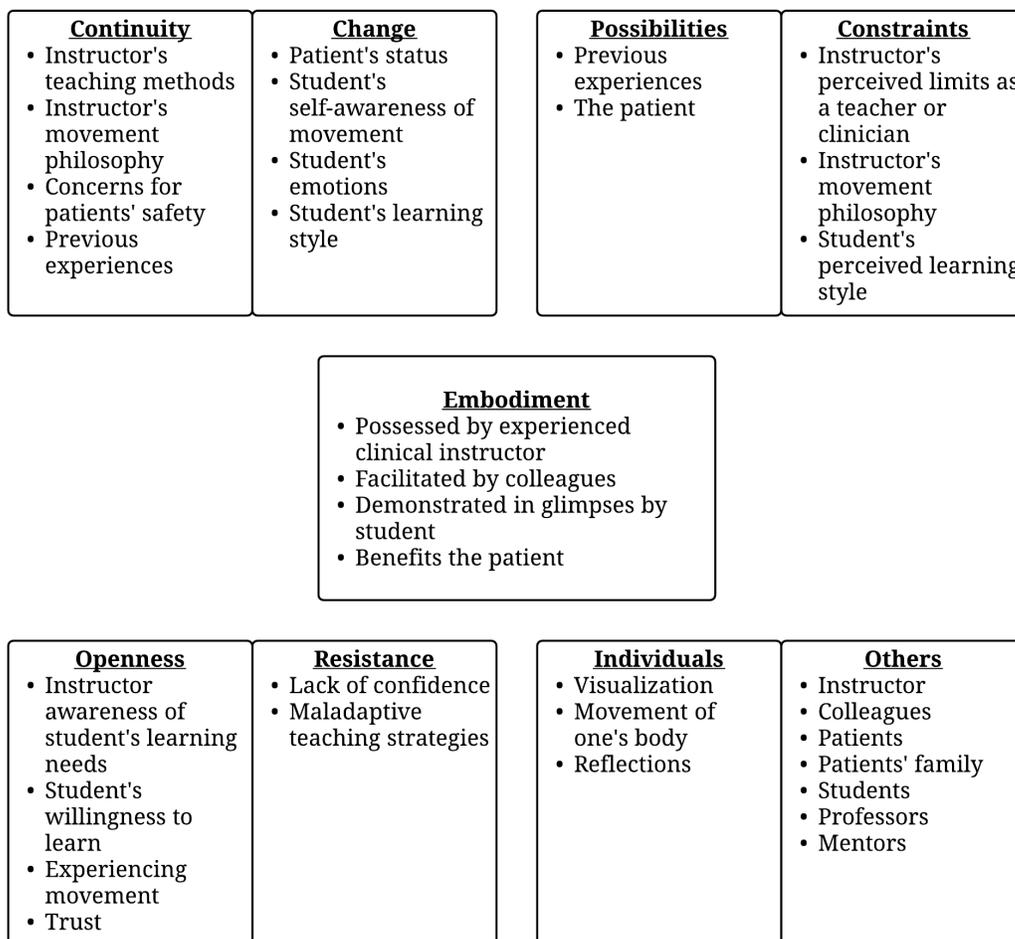


Figure 4.1. Situational map organized using Dall'Alba's professional ways of being.

Embodiment. Dall'Alba (2009a, 2009b) describes embodiment as an ingrained part of one's professional being, that cannot be separated from the person's actions or thoughts. Both in interviews and during observations, participants revealed embodiment in terms of the automatic movement of the therapist's hands and body. When prompted to consider their automatic use of movement, instructors were able to think about how their hands and bodies

facilitated patients' movement and recovery. The discussions, however, usually centered not on the therapist's own movement, but on how it benefited the patient. The instructors had to think deeply in order to discuss this tacit aspect of their practice, as their movement use was so automatic that they had little experience articulating how their hands moved during patient care.

...oftentimes, and I probably shouldn't say this, not that you go on autopilot, but sometimes my mind is following what my hands are doing. My hands are doing first what the intuition is telling my hands to do. And then my mind is kind of following along with what my hands are doing...I think there is that sense of not that you act first, but my hands kind of go first, and then I start to think about what I'm doing next. (Instructor, Hospital Pediatrics)

Over time, the successful student begins to demonstrate movement in patient care that seems automatic and responsive to the patient's needs. However, both students and instructors would agree that there is a great deal of refinement and progress to be made before the student could demonstrate the embodied level of movement of the experienced clinician described above. By the end of the internship, students were able to better describe the intricate use of movement in practice, articulate its ambiguity, and realize the influence it has in patient care.

[Movement use] seems more abstract, like there's not so much a defining piece to it. Like the way that we used our hands with patients was so different. Where [the patient] can like feel your hands on them, and understand what it is you want them to

do. And then there is the facilitative part where once they know what the expectations are, you're just assisting it to happen. But I feel like there's a lot more beyond that that is more innate...I feel like there are times, especially with [my instructor], like she doesn't really know how to put into words what it is that she's doing to get the movement that she does. And I don't know if that just comes with practice and one day it just clicks. I feel like there's a lot more to it, but I don't know how to put it into words. (Student, Ambulatory Pediatrics)

Continuity versus change.

The instructor became slightly frustrated with her student but could not determine the reason. The student was eager, polite, and willing to do whatever she asked. The student interacted well with patients and carefully considered their safety, but the student was different than the others she had taught in the past. The instructor's normal way of relating information to the student didn't seem to be working. The instructor noticed the student sometimes seemed uncomfortable placing his own body in relation to the patient. The student never seemed to want to jump in and try things without first having seen the movement done by the instructor. The instructor discussed this with the student, and together they realized the student learned best by watching and listening and then doing, but the instructor's detailed descriptions of her actions confused the student more than they helped. The instructor decided to try a different strategy that had been successful for a previous student with a similar struggle.

Continuity and change in professional development recognizes that the developing professional retains the person they were prior to the learning experience, while at the same becoming a new being within the profession (Dall'Alba, 2009a). The clinical instructor participants relied heavily on continuity in the teaching/learning relationship. Along with their own use of movement in practice, the instructors' teaching methods had been honed through years of practice and teaching experience. This allowed the instructors to have more

success promoting tacit concepts, such as movement use with students through continuous use of teaching strategies that had been successful in the past. Safe patient handling was always in the forefront of the instructors' minds as they pushed their students to explore using movement, but not at the risk of harming the patient. Additionally, instructors seemed to rely on students having had success moving their own bodies in the past in order to ensure success in the current internship.

Um, most students uh, it just takes them a while, because it takes years of experience to be able to really feel movement. Some people have a just innately better feel for it than others...And um, so they just are already or somebody who's really into exercise or sports. They know movement better than other folks. And um, so they have generally have done quite well with that type of thing better than others. Not that others don't learn. It just probably takes a little more time for them to develop their sense of body in conjunction with somebody else's body. (Instructor, Ambulatory Neurology)

Conversely, there was acceptance that because of the complexity of learning movement with patient care, some aspects are always dynamic and changing in the learning relationship. As described earlier the students' self-awareness and self-concepts of movement use are constantly changing as they learn to apply new skills and reasoning to patient care. The students and instructors recognized the ever-changing aspects of learning movement use which produced a lot of emotion, especially in the form of anxiety, feelings of being overwhelmed, and frustration. Students and instructors both must anticipate these

feelings and effectively manage the changing state of the learning relationship in order to make learning successful.

There's so much there with this particular [patient] that it's in some ways I want [the student] to be aware of the whole body, and then I ask her, tell her, with her hands up here she needs to be aware and also feel for what [the patient's] posture is doing, just not how she's shifting [the patient's] weight. Um, but since this was early on in [the student's] clinical, I also know that I want [the patient] to be safe and I want [the student] to learn some handling techniques, but I don't want to overwhelm [the student] either, so I know that each subsequent time that we work I can expect more from her. (Instructor, Ambulatory Neurology)

Possibilities versus constraints. Possibilities and constraints recognize how practice traditions can facilitate or inhibit a developing professional's ideas about how to operate within the profession (Dall'Alba, 2009a). Students and instructors both recognize that the student's previous experiences, as discussed above, provide great possibility for learning to use movement in patient care. In order to build on the possibilities offered by previous experiences, the student and instructor rely on experiences with the patient. Through their willingness to participate, the patient provides the ultimate teaching tool for learning to use movement, as the instructor can demonstrate and the student practice on people with impairments. The student previously may have only been able to practice hands-on skills in a classroom laboratory with healthy peers. Now the patient provides the possibility for the

student and instructor to engage in a process of discovery and skill refinement in order for the student to better learn to use movement.

The student nervously watched her clinical instructor ambulate a patient who had suffered a debilitating stroke. Though the instructor normally appeared effortless when working with patients, the student recognized that this patient demanded more. The instructor finished, looked at the student and said, "Now it's your turn." She turned to the patient and said, "This is April's first time trying this. I will be right here to help her." The patient gracefully nodded and smiled at the student and said, "Don't worry, we can do this." The student struggled through the treatment. After the patient sat down, the student let out a large audible sigh then feebly smiled at the instructor. Then the instructor looked at the student and patient and asked, "What did you each learn?"

Conversely, however, student and instructor may feel constraint with the teaching and learning styles when learning movement. Students felt confined by their previous notions of their learning style. Many students had long self-identified with a certain style of learning and felt challenged by the new learning style needed to improve movement use. For example, some students viewed themselves as "hands-on" learners who were previously successful learning new skills by trying it themselves. Conversely, some students who were previously successful in learning by watching, now self-identified as observational. Still others found success as auditory learners. According to instructor and student participants, some students found their preferred way of learning to be ineffective for movement use. The auditory learner may need to practice more with her hands. The hands-on learner may need to take a step back and listen and observe in order to best understand the intricacies of movement. Here, a student confronts a self-realization that he had always identified as a detail oriented and auditory learner, but in movement discovery, he preferred to be a hands-on learner, exploring how to make things work without a lot of input from his instructor:

...I think, originally I told you I really liked having somebody verify, like yes, you are doing this correctly. But I feel like after this last clinical experience, I really felt like I've had a lot of training, you know, didactic training. And I felt like I was at a point where I could start learning what felt right and what didn't. I felt like I was at a point where I'm starting to understand yeah, this makes sense where I'm putting their limb. Or how I'm helping them move their limb. It just definitely made more—it was more intuitive I think, um, this last clinical rotation. And that might even be just the experience. I really do think that helps—just learning what works, what doesn't work....I think there's a time and place for being nitpicky, and there's a time and place for letting a student kind of learn on his or her own. (Student, Acute Rehabilitation)

Openness versus resistance. Professionals are required to demonstrate openness in order to change and to sustain this attitude of openness, free from resistance, long enough to integrate those changes (Dall'Alba, 2009a). In the learning relationship focused on movement use in practice, the experienced instructor is keenly aware and open to the student's needs as a learner. The student, likewise, needs to possess an openness to learn from his or her instructor. Participants articulated feelings of openness in the learning situation by using the term "trust." The discourse about trust focused on how feelings of trust between the student, patient, family, and instructor facilitated optimal learning.

Oh for sure. I mean, um, if you know that there isn't that level of trust built up already, especially as a student I think you're really nervous about your handling

skills. Um, because you know they're watching your every move, and it yeah, if you're working on your confidence that's only going to make you very like myopic about every little movement that you make. (Instructor, Ambulatory Pediatrics)

If a foundation of openness, or trust, was evident between the student and instructor participants, then most resistance in the learning situation stemmed from a lack of confidence on the student's part. The instructors were eager to see confidence in patient interaction and ownership of learning from the students. Though they accepted that the students would struggle, they hoped to see confidence build quickly and were quick to allow opportunities to build confidence if needed. Likewise the students readily reflected that the major barrier to learning movement was their own confidence.

Her student always sat at the far edge of the treatment mat with a rigid posture. When she would ask the student to try what she had just demonstrated, the student would pause, look down, then quietly say "sure". The instructor knew confidence was an issue with her student. They had discussed it several times, but these discussions did not seem to be making a difference. The instructor watched as the student attempted a complicated maneuver with the patient to assist him to move from prone to sitting. Immediately the instructor remarked, "Beautiful, that was beautiful." It was clear to the instructor that the student did not agree with her assessment.

Individuals versus others. Learning in the professional context must be entered into with others while the professional retains his or her sense of individuality (Dall'Alba, 2009a). Student and instructor participants recognized the importance of learning movement in conjunction with others. Students or instructors rarely offered ways to learn movement as an individual. Some students recognized ways, such as visualization, to enhance their movement use without the help of others.

Um, I think it's kind of—this is going to be a weird example. But it's kind of like you play a movie of yourself doing it in your mind, and then go in and you just kind of try to follow that. And it always changes, because your patient never looks the way you expect or the room isn't set up the way you think it's going to be. So it always changes, but you kind of run this video through your mind of yourself doing it. And you go from there. (Student, Hospital Pediatrics)

Instructors recognized that students who had increased self-awareness of their movement may have more success integrating it into practice. However, they often pointed out that the student always needed the feedback of someone more experienced to make their movement effective. Participants frequently remarked that effective teaching and learning strategies for movement use relied on working with others. Likewise, students and instructors often articulated the benefits of learning from other colleagues in the clinic.

I mean there are PTs that have practiced for years that know just these little secrets that are magical almost... There's just such a limited amount of information and knowledge that you can gain while you're in school. And there's so much out there that [clinical instructors have] seen or unique cases. There's a lot to be said for what you can learn in the clinic.... I don't think being alone is the best way to facilitate that. (Student, Outpatient Pediatrics)

It is evident from the situational map organized using Dall'Alba's professional

ways of being that students and instructors encounter ambiguity when developing use of movement in practice. These ambiguities provide a basis for considering what the students and instructors must negotiate as they begin to instill an embodied sense of movement use.

Teaching Strategies and Their Intended Outcomes

Instructors use a myriad of teaching strategies to help students learn to integrate movement in practice. When examining the data the strategies categorized denoted purpose. I created a second situational map to examine this phenomenon. I listed strategies and concepts discussed by student and instructor participants and grouped them into common teaching and learning categories by potential outcome (see Figure 4.2). These outcome categories included: Becoming Aware of Movement, Preparing to Learn, Seeking Help, Correcting Movement, Making Connections, Developing a Movement Style, and Career Development.

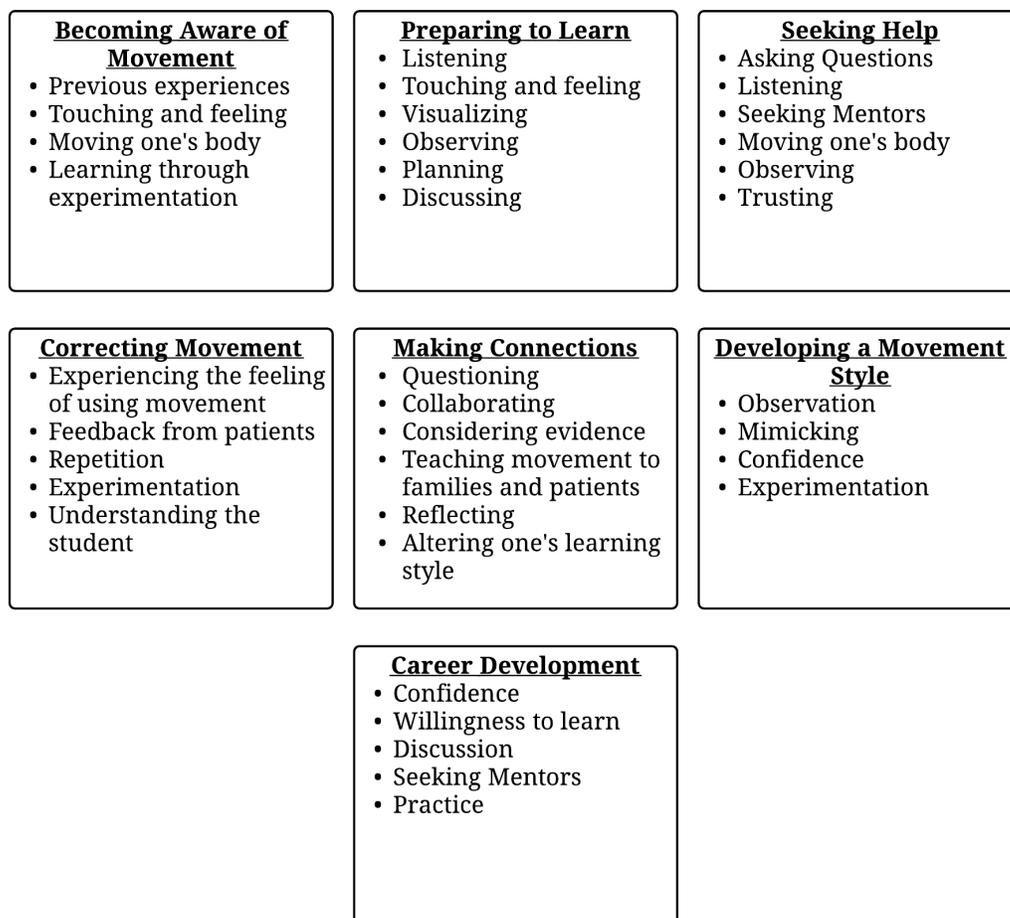


Figure 4.2. Situational map depicting the common strategies used to facilitate learning to use movement in practice categorized by potential outcome.

Becoming aware of movement.

During the first week of the internship, each time the student worked with a patient, the instructor asked her to describe what she felt. The student quickly learned the instructor was not curious about how the patient's movement felt, but rather how the student conceptualized her own body as it interacted with the patient.

Participants discussed the importance of becoming aware of one's own movement in order to better understand and use their own hands and bodies to affect change in their patients. This increased awareness could stem from previous experiences as an athlete or dancer where awareness of one's own body is vital to success. Additionally, participants discussed increasing awareness of movement from touching and feeling the patient's body while they attempt to move, practice moving their own body, and finally through the experience of trial-and-error when working with patients. The students' awareness of their own movement was often solidified when the instructor would request the student to reflect and describe what they were feeling and doing.

I think like um, for truly those people who are very familiar with their own movement or particularly the dancers. Dancers are really good. Um, they know how to use their body and movement of their body and different body parts to achieve certain things within themselves. So it's easier for them to connect that to other people. (Instructor, Ambulatory Neurology)

Preparing to learn.

The student and instructor were seated on either side of a small boy. The boy, weak from cerebral palsy, was unable to sit up. Before the treatment began, the instructor asked the student to familiarize herself with the patient by holding his body and determining his needs. Once the student had done this and nodded, the instructor was ready to begin.

Students had to learn how to prepare to use movement during the treatment session. This preparation came in different forms, but was often a new or different experience for the students compared to how they had prepared to learn in the classroom. Instructors helped

students learn to prepare for using movement by encouraging them to think or talk through their movement plans for treatment, visualizing their hand and body placement, or through engaging in discussion and active listening to the instructor's descriptions about their movement use during treatment sessions.

And um, handling wise, I mean I guess preparing in that session I had to think about where to best position myself, whether I should be sitting, standing, um, to the left, to the right, behind them. And just figuring out um, where to position myself and where to position the patient to then facilitate them for whatever we were working on.

(Student, Ambulatory Pediatrics)

Seeking help.

The instructor was doing so much to help the patient that the student was completely overwhelmed. He had no idea what he was seeing, only that the patient seemed to be moving better than he had expected she would. He knew the instructor would ask him to reproduce this movement with the patient next. So he began to place his hands on an imaginary patient and practiced. The instructor noticed this and promptly assisted his patient to sit down. The student immediately began asking questions.

In order to effectively learn to use movement, students had to know when and how to ask for help. Most students described feelings of confusion and feeling overwhelmed early in the process while integrating these new skills and knowledge. However, students quickly realized they had to find strategies to improve to meet the expectations of their instructor and patients. Students used a variety of methods including asking questions, mimicking their instructor and seeking approval, having discussions with other mentors and colleagues, listening to their instructor's descriptions, and learning independently by trial-and-error during patient care.

I mean you definitely feel a little bit of anxiety to go along with that. But I think at that moment you realize, OK, I'm a student. This is OK. Um, you know, I can ask these questions. I'm still in the learning curve and there's no way you're ever going to know everything. So even when you get out and you're practicing or, you know, things like that, there's just no way to know everything. And being able to feel more comfortable asking those questions or turning to someone and be like, "I don't know what to do next," or things like that. That's a skill to learn in and of itself. (Student, Inpatient Pediatrics)

Correcting movement.

The instructor sensed the student's growing frustration as she attempted to facilitate the patient to move her weak leg forward to a designated target. After several failed attempts, the instructor stopped the student, motioned for her to stand, and began to place her own hands on the student's leg, moving it to an imaginary target in front of the student. The student indicated she understood then helped the patient's weak leg, finally assisting the patient to hit the target.

Using movement in practice must be effective in order to facilitate the patient's progress. Student and instructor participants agreed on the need to correct the student's use of movement as they attempted to learn to use their hands and body when working with their patients. Students appreciated feeling what their hands should be doing by having their instructor's hand placed over their own during patient care. This form of action learning helped the students know moment to moment how their hands should be placed and the correct direction and amount of force to use to get the desired result. Students and instructors also recognized the importance of feedback from the patients. Many patients felt the movement of the instructor then compared that to the movement of the student and provided

valuable information that allowed the student to correct his or her own movement.

Instructors also articulated the importance of knowing how and when students preferred to receive feedback in order to maximize the effect of their teaching. Students articulated emotional responses to the correction of their movement. Students sometimes felt frustrated that they could not better help their patient because of their own lack of skill and, thus, desired more and more feedback. At times, however, this feedback also felt critical.

I really felt like [my clinical instructor] was critiquing me well, maybe just providing a lot more helpful instruction, maybe in those previous internships, they didn't really want to correct it. Maybe with [previous instructors] it's not that big of a deal, but I felt like [this instructor] was more willing to correct, and maybe I was afraid of that, that correction from him. But I also wanted it. Like now I'm looking back. I was like this has probably been the best clinical experience because he did provide critical feedback, and it was good. (Student, Acute Rehabilitation)

Making connections.

The instructor paused the treatment session to teach the student a new way to help the patient move from his chair to the mat. She demonstrated it, asked the student to practice on her, then instructed the student to perform the technique on the patient. When the student had performed the task successfully with the patient, the instructor requested the student explain to the patient and his wife why this technique was more effective than the previous one.

The participants recognized that a vital part of learning to use movement in practice is the ability to begin to make connections between when, why, and how to use movement with different patients. Throughout interviews and observations, clinical instructors described the importance of students understanding the reasoning behind movement strategies chosen in

patient care. It was not enough for the students to attempt to reproduce what they saw the instructor doing, the student must be able to use sound clinical reasoning and articulate their findings in order to integrate and ultimately embody a use of movement in practice.

Instructors described multiple factors that may aide in this process, such as questioning their students to elicit their reasoning, having their students work together with other students, engaging in discussions about the importance of evidence in practice, reflecting on their own practice and by requiring the student to educate patients about their treatment decisions. All students in the study articulated an advanced understanding of the importance of movement use by the end of their internship. This progression in their conception of movement mirrored an understanding of its broader impact on their clinical decision-making and patient care. By making such connections, the students progressed in their use of movement in practice through deeper understandings of how to effectively use their own bodies.

I think that going into it I didn't understand quite how large the importance of the hands was and really that—I mean hands were hands before. And now hands are a learning tool, and a huge way to make change. But there's—I feel like I am much more sensitive to my hands....So really just like training your hands actually to be a tool versus a body part. (Student, Ambulatory Pediatrics)

Developing a movement philosophy.

The instructor scheduled a time each week for the student to spend with a different therapist. The student eagerly anticipated this part of the week and enjoyed the opportunity to watch different therapists treat patients similar to the caseload her instructor managed. As the weeks went by, the instructor noticed the student beginning to move her body in ways very different than how the instructor

approached treatment. She recognized some of these movements from the years of watching her colleagues. Some of the student's movements, however, were new.

Instructor participants often discussed their colleagues as demonstrating or possessing a certain “style” of movement, sometimes referred to as a “movement philosophy.” Often the instructors could readily describe the “style” of their colleagues but found it more difficult to articulate their own. When discussing their coworkers or mentors, they used phrases like, “*She is extremely hands-on with her patients and feels more than she talks.*” Or “*He is playful in his movements with the children, but she is deliberate and sequenced in her use of movement with the kids.*” Or “*My previous mentor was more exploratory in her movement use than I am.*”

As students demonstrated increased confidence, engaged in reflection, and treated patients, they made more connections with their own body and could effectively use movement to assist the patients. Sometimes the students began to demonstrate a specific style of their own, independent of their instructor’s preferred movement philosophy.

I think the aspects of her personality, just the way [the student] is, um, the way she kind of approaches new situations, I think she is more tentative in the beginning so I think she does even stand back and completely separate of me as a CI, she likes to evaluate and see what she sees before she just dives in to movement. I think some people just can’t wait to get their hands on and go, go, go and try and get a certain result with their therapy interventions, but I think she’s more the type of personality—maybe movement wise—that’s prone to kind of sit back and see what

she sees before, and then tries to formulate a plan that's very like purposeful and then she's ready to intervene. (Instructor, Ambulatory Pediatrics)

In the same way that instructors were able to effectively describe their colleagues' movement styles but had difficulty describing their own style, students said that their styles were "developing". Some students stated their style was currently a copy of their instructor's, while others were able to reflect that their own use of movement was different than that of their instructor.

Career development.

The therapist beamed with pride when the patient asked the student where she would like to work after graduation. The student remarked that, though she had never considered it prior to this internship, she had plans to look for a job in a hospital setting similar to this one.

As the internships drew to a close, the instructor and student participants all began to think about the students' future career development. All students and instructors recognized that confidence would continue to be important to skill progression. Students and instructors indicated that a continued openness to learning would be vital in order to build on the students' previous experiences. They also considered finding job roles where a high exposure to varied patients would be important to ensure further progression of movement use. All of the participants spent time during the internship discussing career development opportunities and exploring how the students' use of movement would translate into their career.

My predictions for her are that she will continue to build her confidence once she sees that patients and families, um, would trust her and build a strong rapport with her

right off the bat. It's a skill that I think is part of her personality that comes to her with ease. And I think that will help her unlock kind of the first couple of years of her, um, therapy skill set. I think her hands will become more confident and she will become more skilled. But my other prediction, I think is that she will wind up being a pediatric therapist very soon. (Instructor, Ambulatory Pediatrics)

This situational map depicting the common strategies used to facilitate learning to use movement in practice demonstrates the various categories of learning that are provided by the instructor. To further understand how the instructor facilitates learning, I next created a situational map examining the various relationships encountered when learning to use movement.

The Relationships Inherent in Learning to Use Movement

The student, excited to begin her pediatric internship, is eager to learn as much as she can from her instructor. Though the student has not yet had an internship in pediatrics, she spent years as a camp counselor for developmentally disabled children. Throughout her coursework in physical therapy school, she found that this experience provided a rich context for applying the infinite details provided by her faculty during her didactic coursework. Additionally, the time spent in special elective pediatric coursework and clinical observation experiences have prepared her to be successful in this internship. She looks forward to using the skills she has amassed in this new clinical setting, finally working with pediatric patients.

Just nine short weeks later, the internship is quickly drawing to a close. She has developed a deep admiration for her instructor's clinical skills and wisdom. What she did not anticipate at the beginning of this internship was the wisdom she would gain from others. The other clinicians have shown her alternative treatment methodologies, shared their clinical reasoning, and challenged her by demonstrating various ways to treat patients. Most importantly are the lessons she has learned from her patients. Now at the end of the internship the student begins to realize her clinical instructor has organized the past 9 weeks to enable her to pass her wisdom to the student but also to reinforce that learning through the exposure to other colleagues and patients.

Understanding how the various actants involved in learning to use movement affect one another is important. I created a situational map of relationships to explore the interactions at play as students learned to use movement (see Figure 4.3). The major actants depicted in the map include the student, colleagues, the patient, and the instructor. The key influences discussed in the data for each of the actants are also included.

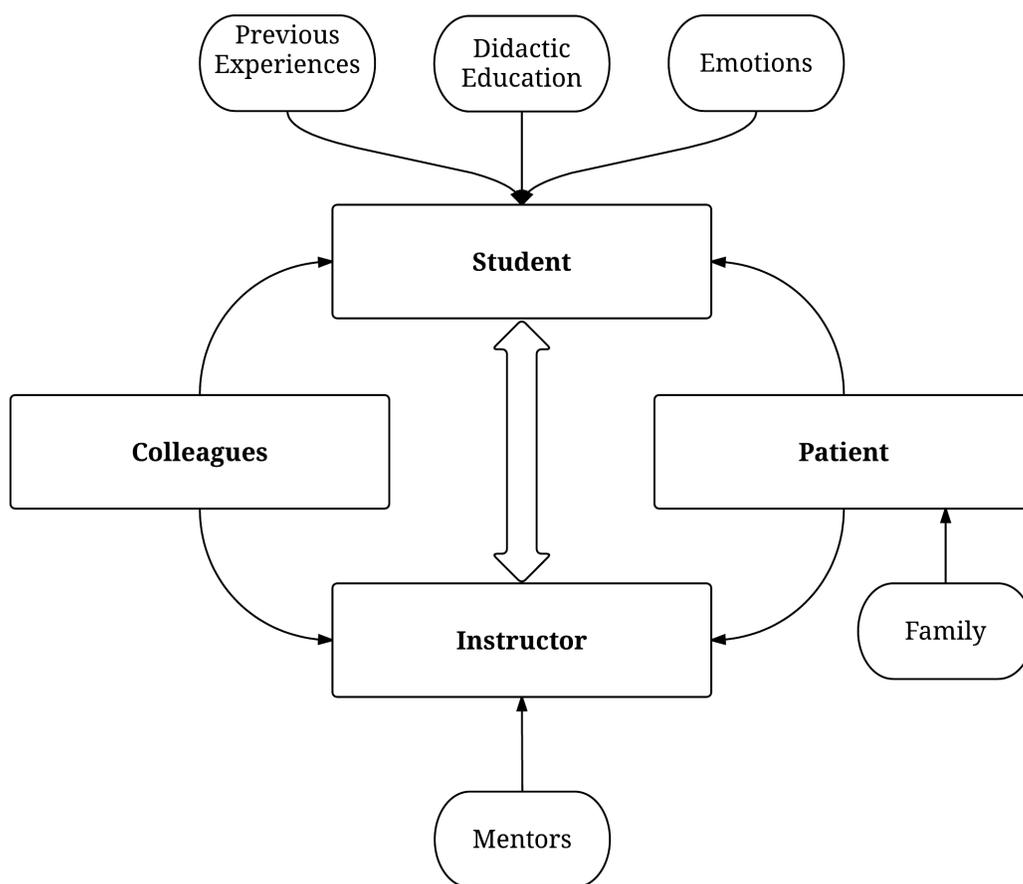


Figure 4.3. Situational Map depicting the relationships encountered when learning to use movement in practice.

Impact of the student. The student is the focus of the instructional efforts during the internship period. The clinical instructors' primary role becomes one of mentor and guide, as he or she develops the clinical skills and reasoning necessary to effectively utilize movement when treating patients. However, the student is not only viewed as a learner. The student was frequently seen as an important contributor to the learning environment. The student comes to the clinical facility a product of his or her previous experiences and a repository of information gained in the classroom. All instructors remarked that they always learn from their students. Sometimes this learning is in the form of content knowledge, but the students also help the instructors learn more about their own clinical reasoning and movement use.

Oh sure, yeah. I learn stuff from students all the time. I mean it's one of the reasons I love having students. Um, and so, I mean you learn from them of course, because they've got a lot of new academic stuff that unless you get to read all the time, you don't have. Um, but then just also—I think the main thing I learn from students it wouldn't necessarily be how they use their bodies, because they're so new at that they don't have that sorted out, but the ideas that they bring. I'm so glad [they] had that idea. And then the student and I sorting out together how to make it happen.

(Instructor, Ambulatory Pediatrics)

Impact of colleagues. Learning movement is ambiguous. This ambiguity is confronted through the student's exposure to clinical colleagues. The primary clinical instructor provides the student a foundation for learning movement through instruction, modeling, and critique. This foundation is challenged and subsequently strengthened

through the student's ability to work with other physical therapists, students, and various practitioners. These colleagues may provide alternative ways of using movement in contrast to the student's primary instructor. Exposure to a variety of colleagues enables the student to realize the importance of learning from others, integrate conflicting feedback, and use a variety of movement methods to treat the patient. The clinical instructor successfully models this relationship when the student can witness a collaborative learning environment between therapists who work together to share clinical wisdom and solve movement problems.

It is nice when you're on [clinical internships] that you always have somebody else to turn to in like kind of that reassurance, because I think that that will be really important with like the first job that I get is having a mentor that's really going to mentor you and be there and help you transition, and talk through things. Um, I've noticed several therapists here do that. Maybe not so much in like a mentor, but like as co-workers they will talk about different things that they see and work it out between the two of them, you know, what they think would be best. So the balancing of ideas. (Student, Ambulatory Pediatrics)

Impact of patients. The instructor uses each patient encounter to help the student begin to understand the use of movement in practice. This process usually begins when the student observes the instructor working with the patient. Either during the treatment or afterwards, the therapist describes to the student what his or her hands and body are doing to assist the patient. Next, the therapist may demonstrate on the student and then have the student try with the patient. Often the instructor would give concurrent feedback as the

student worked with the patient. The instructor would also ask the patient to give the student feedback about how his or her movements differed from the instructor's. This level of engagement between the student and instructor relies on the willing participation of the patient. Without the patient's willingness to allow the student to practice, the student would be unable to refine his or her skills on a body that is weakened, in a state of pain, or dysfunctional. This was rarely a concern of the patients who willingly engaged in the teaching process by volunteering their body as an instrument for learning. Likewise, family and friends of the patient often engaged in the student's learning by providing feedback to the student, answering questions about the patient's home environment and lifestyle, or helping the student to better understand the practical implications of the patient's challenges outside of the therapy clinic.

The patient, of course, is the most important member of that threesome. And the patient also gives feedback both by how they're performing, uh, because at times if you're giving too much facilitation, they may also—you may be producing mechanics you don't want, because of excessive facilitation. So you're getting feedback from them that way by the way they perform. Or it's hurting, or they feel like they're being pushed too far in one direction where they feel like they're going to lose balance so the patient can also give that feedback. And if they are gaining improved movement or good movement, seeing your patient getting excited about it is a very positive feedback for the student. (Instructor, Ambulatory Neurology)

Impact of the clinical instructors. Just like his or her student, the clinical instructor's wisdom, reasoning, and use of movement have been developed by their mentors, colleagues, and patients. The instructor uses what they have learned about movement use and combines that with what they have seen modeled in teaching to help the student develop his or her own use of movement in practice. Once the student has had time to reflect on the impact of this learning relationship, he or she often remarked how awe-inspiring the instructor's abilities with movement are. The instructor's challenge, then, was to make this elusive skill tangible for the student. Here an instructor describes the impact he felt when considering one of his clinical instructor's use of movement.

And [his] hands were amazing...[He] could make anybody move the way [he] wanted them to move with very light touch...[His] hand position and [his] placement and [his] touch just so influenced how the person could move, and someone who had no movement was moving. (Instructor, Ambulatory Neurology)

The situational map of relationships provides an overview of how the major actants involved in learning to use movement influence each other. Through these interactions, we begin to see the vital interactions necessary for students to integrate movement into their practice. Possibly because of the multiple interactions involved in this situation, there tend to be a myriad of opinions about how movement is taught and learned. Next, I will examine these opinions and how they impact the instructor's facilitation of movement use in their students.

Positional Maps

I used positional maps to examine the various discourses within the data and depict how differing opinions influenced the students' use of movement in practice. These maps help examine the major conversations that occurred in the data and depict contrasting opinions amongst participants. I used Dall'Alba's Professional Ways-of-Being framework to map the positions of the four professional ambiguities and their influence on embodiment of movement. Additionally, I created maps depicting three other topics consistently discussed amongst the participants. These maps depict the discourse around how students learn to use movement by mimicking or learning independently, the influence of observation on learning movement, and instructors' perceptions of student movement use and their predictions of the students' embodiment of movement.

Continuity and Change: Self Reflections on Movement Use

Participants clearly articulated the concepts of continuity and change when they discussed their feelings of developing movement use. While clinical instructors shared a common position, students ranged across three positions related to their embodied use of movement (see Figure 4.4). These differences reflected the students' levels of confidence and comfort in the clinical practice setting. For some students, their positions changed from the beginning to the end of the internship, while for others, they remained the same.

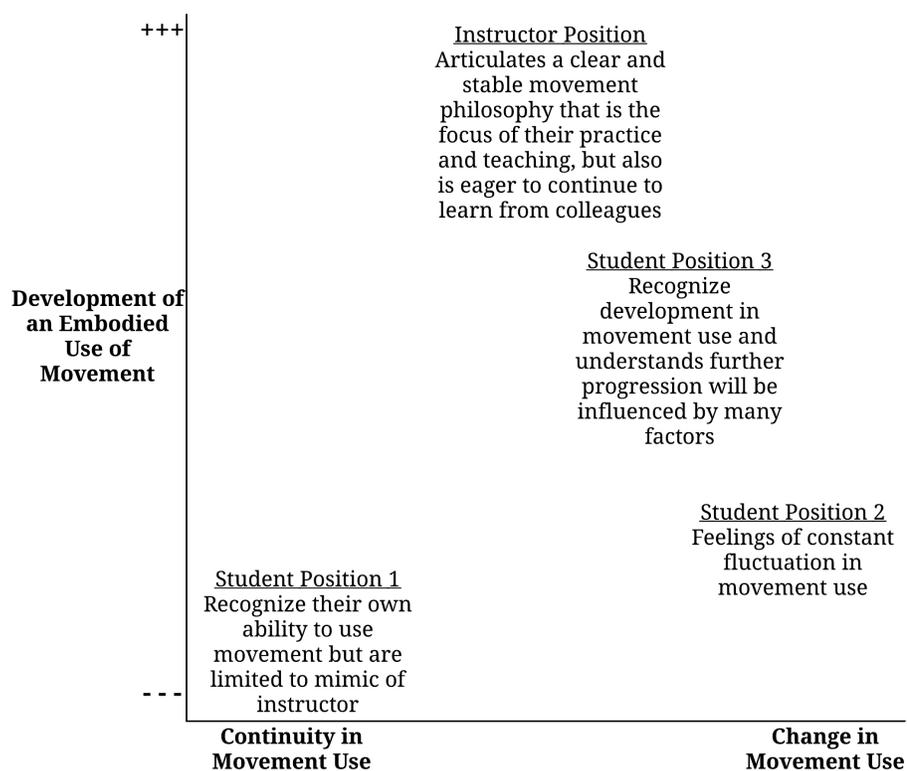


Figure 4.4. Positional map depicting student and instructor concepts of continuity and change in the development of an embodied use of movement

Student positions. The first student position indicates student participants who recognized they were beginning to develop their movement use, yet felt it was limited. These students recognized that they were only able to mimic the actions of their instructor and had a limited ability to apply clinical reasoning to extend their actions in treatment to more complex or alternative patient scenarios. This position indicates continuity in movement use but minimal development of an embodied sense of movement use. Students

often voiced this position at the beginning of the internships or throughout the internship if confidence was lacking.

Initially she felt overwhelmed and frustrated when asked to treat a patient. Her instructor's hands were amazing, and no matter how hard she tried she could not reproduce the results. As the weeks went by, however, she got better. She found she was able to use her hands to produce the results her instructor wanted in the patient. Though her confidence had increased and she knew she could provide a beneficial treatment session to a basic patient, she was always apprehensive something unexpected would happen. She didn't know how to be creative yet. She felt she could only replicate exactly what she had observed and subsequently practiced.

The next student position reflects those who articulated a high amount of change in their movement with negligible feelings of embodiment. Students with this position felt that their movement use was in constant flux. Some moments, they felt a sense of great accomplishment, while at other times, they felt completely ineffective. Though there was still a low amount of embodiment, this position is indicative of growth beyond the first position, as these learners were better able to apply clinical reasoning independent of their instructor to reflect on their treatment decisions and effectiveness of their movement use.

I've had times where, you know, patients are like uh, gosh, I feel great now... We helped this person out, and I didn't really like, you know, think—I didn't really think about the movement itself, but uh, I thought we did the right thing... Other times I feel like um, I may have gotten, well with gait training sometimes I feel like I might get in the way of the patient. Later on I'll be like uh, maybe I should have done this or that. But usually, I don't focus too much on my movement and the aftermath. It's usually just, you know, the result and I guess what I did was right. And I kind of in

my mind just copy what I did movement wise, and in the future. (Student, Acute Rehabilitation)

For the third student position of continuity and change students articulated a clear recognition that their movement skills were developing. Furthermore, they realized their future progress would depend on many factors including future mentors, practice, education, and experiences. These students exhibited a developing level of embodiment with a high amount of change still present in their use of movement.

I feel like you're going to have to learn and change. You're always going to be adapting to whatever population you're working with, and then each population is going to teach you something new. You're going to learn. So that just that feels like or this does not work for this population. I need to do it this way. And so I feel like there's always going to be continual building of skills that you have stored. (Student, Hospital Pediatrics)

Instructor positions. The instructor's position reflects a high degree of embodiment and a beneficial balance between continuity and change. The instructors, whose movement use is engrained and automatic, are able to clearly articulate their own philosophy of movement use in practice. However, the instructors are also able to recognize that they, too, have much to learn from their colleagues. This realization is not threatening, but exciting. The flexibility in the instructors' movement use represents their belief that their skills and clinical reasoning must be constantly altered to meet the individual needs of the patient.

Continual learning from colleagues and adaptation of their movement skills will help achieve this.

I'll try to expose [students] to other therapists who have different styles of movement. Um, I think one thing that's really important—it's important that you've got to get the ego out of the way... There's a lot of other therapists you work with who have very good movement that is not going to be exactly yours. And you know, some of it may be better than yours in their specialty or even in your specialty. And um, so I try to let them see other therapists', uh, movement too. Because sometimes it's different.

Sometimes it's better. (Instructor, Acute Rehabilitation)

Possibility and Constraint: Instructors' Perceptions of Influences on Student Development

The instructor participants discussed the concepts of possibility and constraint as they relate to the development of an embodied use of movement in their students. The four positions reflected are flexible learning styles, trusting patients, self-perceived limitations, and previous movement experience of the student (see Figure 4.5).

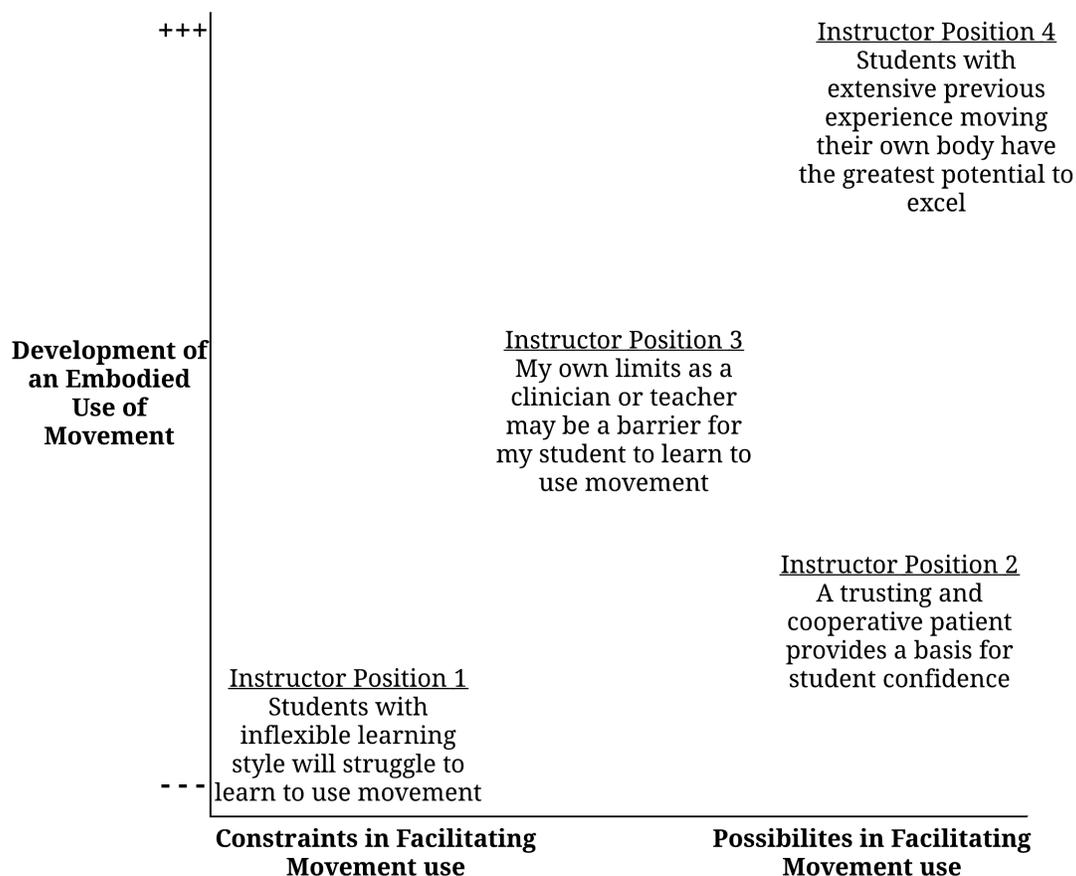


Figure 4.5. Positional map of clinical instructor's concepts of constraint and possibility in the development of an embodied use of movement

Inflexible learning styles. Instructor participants noted that most students entered the clinic stating they learned best by doing. However, instructors agreed that often students might need to adapt to a different learning style in order to best learn to integrate movement use in their practice. Students who could not adapt were considered to be constrained and incapable of embodying movement use.

...they just want to trial-and-error, trial-and-error and kind of, you know, dig through it, and figure out the best response...It's, it's tough because, um, I don't think that style is wrong. It's just foreign to me. So I try and let them go through that if that's their style to a certain point, but then I have a tough time if, if they keep just trial-and-error, and it's fail, fail, fail. Then I have to intervene with the style that I'm more comfortable with as a, as a teacher or an instructor and see if that works. And sometimes it does, sometimes it doesn't. (Instructor, Ambulatory Pediatrics)

Trusting patients. Instructors agreed that a trusting patient encounter for students provides great possibility for learning. Though it was vital to give students challenges, instructors had to carefully select patients that provided both challenge and offered trust. Without that trust, the students would not have confidence or realize success in their use of movement. This position reflects a high degree of possibility with an emerging level of embodiment.

The instructor balanced each week in the internship with a progressing level of complexity in her patient caseload. This offered the student the opportunity to build her confidence while practicing her hands on skill. Initially the student assisted with simple components of the treatment, such as stretching, or transferring a cooperative patient. As the days and weeks progressed, more complex movement skills were requested of the student; however, the instructor always carefully chose the patients she knew would be amenable to the student's tentative movement use. Midway through the internship, the student took ownership of the care of a challenging patient with a mother who voiced constant questions about the treatment decisions being made. In the last week of the internship, the mother praised the instructor for the wonderful care the student had provided and noted her son had made significant progress.

Instructor's self-perceived limits. When students struggled with their movement use, the experienced clinicians felt constrained, wondering if their teaching skills were

adequate to meet the student's needs as a learner. Instructors each reflected on similar challenges they had experienced in the past and developed a plan for helping their student based on previous successes with students. However, sometimes the instructor felt that he or she didn't have enough to offer. This may be a reflection of the instructor's lack of confidence in his or her own movement skill, or it could reflect the instructor's disappointment that he or she could not help the student achieve the same level of success that the instructor had when he or she was a student. Despite the high level of embodiment present in the instructors, they exhibited periodic self-perceived constraint in their ability to help the student.

The instructor had years of practice experience in pediatrics. Her patients and their families clearly admired her demeanor and her clinical wisdom. Her movement skills were fluid, graceful, and automatic. However, she remained doubtful that they were enough. She admired her colleagues and the formal training they had in movement use. She had never been able to take advantage of some of the certification courses her colleagues had, and she wondered if such experiences would make her a better clinician and teacher.

Previous movement experience. The greatest influence on student early success in learning to use movement was their previous experiences with movement use. Instructors agreed that students who had extensive experience using their own body, whether through sport, fine arts, or clinical experience, showed the greatest successes in their ability to observe, implement, articulate, and understand movement use in patient care. This position represents the most possibility and greatest potential for embodiment.

So I have had students, several students...who have been dancers, professionally, before they got into PT. They have a better feel for movement. You know, because

dance is all about movement and rhythm, and uh, and to me, balance and walking are about rhythm... They know movement better than other folks. And um, so they have generally have done quite well with that type of thing better than others. Not that others don't learn. It just probably takes a little more time for them to develop their sense of body in conjunction with somebody else's body. (Instructor, Ambulatory Neurology)

Openness and Resistance: The Student-Instructor Relationship

There was strong discourse in the data related to the influence of openness and resistance in the student-instructor relationship. The levels of resistance and openness had a clear and direct influence on students' abilities to progress in their use of movement. In this positional map, there is a clear trajectory of increased embodiment with increased openness in the relationship (see Figure 4.6). The positions progress from maladaptive teaching strategies to an instructor's acknowledgement of students' needs and student willingness to learn. The final position describes a symbiotic level of trust between the pair as the ultimate need for integrating movement use in practice.

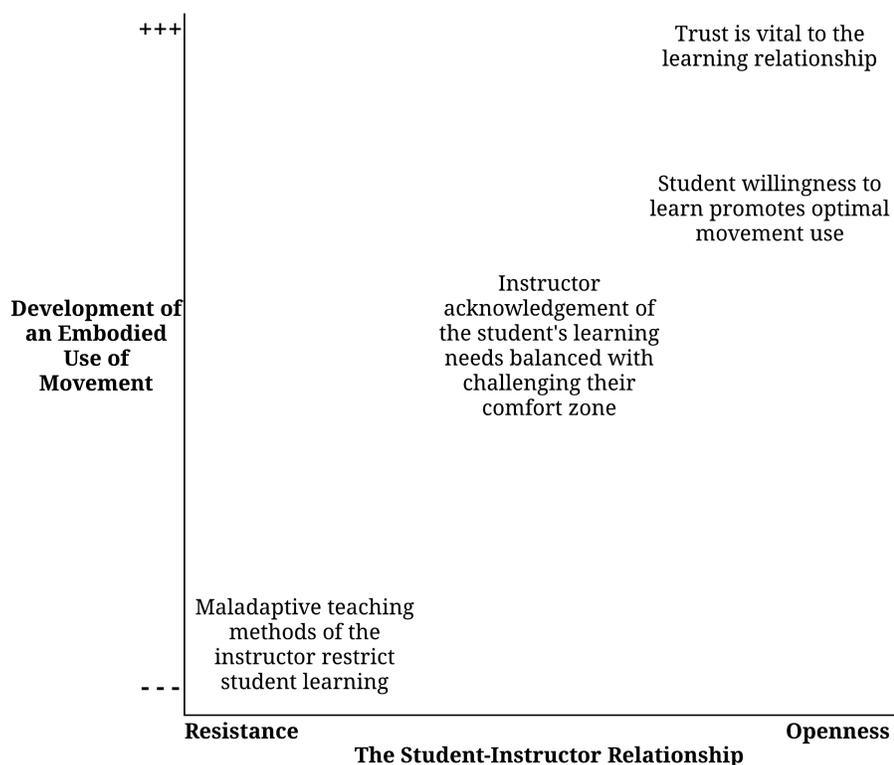


Figure 4.6. Positional map depicting the influence of resistance and openness in the student-instructor relationship on the development of movement use

Maladaptive teaching methods. The greatest resistance to student progress use of movement was if an instructor's teaching methods could not adapt to the students' needs. As previously discussed, some students struggled to find an effective learning style. Because the use of movement in practice was so novel to the students, they needed assistance to negotiate how to learn. Previous strategies for didactic knowledge acquisition may not be effective for learning movement use in the clinic, and instructors needed to help the students realize this.

Occasionally there was tension when the instructor did not offer effective assistance for the student, resulting in a high level of resistance in the relationship with little progress towards an embodied use of movement.

The instructor perceived the student as tentative, withdrawn, and lacking confidence. The student, eager to learn to use her own movement to help her patients felt she never got clear instruction and insight from her instructor. She struggled to find the key message in the instructor's lengthy and detailed descriptions of what she was doing with patients. Eager to share her knowledge with her student, the instructor often diverted in tangential conversation in an effort to teach the student as much as possible. It was this very desire to help the student learn that resulted in the student's confusion. The student, not at all withdrawn, instead felt defeated in her ability to learn all she knew her instructor had to offer.

Balanced needs of the student and instructor. In contrast to the effects of maladaptive teaching, instructors who were able to find a balance between the needs of the student to learn movement and their own desire to push the student beyond the student's comfort zone better progressed the student's movement use. While a challenge to the student's comfort zone could cause temporary resistance, ultimately it resulted in further progression of the student's embodied use of movement resulting in greater openness. Here an instructor describes an effort he made to build the student's confidence while at the same time pushing her boundaries.

Um, I don't know that I did this on purpose, but there was one session where I took the lead and it didn't change the tone of the parents' level of trust or whatever. So if anything, maybe it helped her realize that it had nothing to do with her...And so once she saw me go through the same thing...I think it lifted a little bit of a weight off her shoulders that she was like this has nothing to do with me personally. They're not

against me as a student kind of learning how to take care of someone like him.

(Instructor, Ambulatory Pediatrics)

Student willingness to learn. Of great importance for the student's ability to integrate movement use in his or her practice was a deep and open willingness to learn. Students who were truly open to this level of learning were viewed as most likely to be successful in embodying movement use in their future practice.

She was there eight weeks. She was uh—most of my students I have are really seeking knowledge, and in all ways of learning she was more open and excited than probably many students. And I shouldn't—I don't say that negatively about other students, because they're excited about learning, but she just had another dimension of that. (Instructor, Ambulatory Neurology)

Trust in the relationship. Throughout the participants' discourse, openness and trust were used as synonymous terms. Through the concept of trust, students described a general openness to learning, trying, exploring, and making mistakes. Also through trust, instructors were open to student practice, increased student responsibilities, and were more likely to place their patients in the care of the student. Instructors and students all felt that trust was the most vital aspect of the student-instructor relationship. Trust was crucial for the instructor to adapt his or her teaching skills, the student to integrate what was being taught, and for the student to demonstrate a genuine willingness to learn. Instructors and students needed to build trust quickly to promote student progress. Without this mutual regard for the

learning relationship, the student would not be able to successfully integrate movement use in his or her practice.

And then really just the biggest thing was [my instructor] trusting me to handle the kids...I could just tell that he [trusted me] by handing things over to me, um, and I think he was comfortable or knew that I would ask for help if I needed it or I wasn't sure. Um, that I wouldn't put the child at risk. So, um, I don't remember when that happened, but I feel like it was pretty quickly. (Student, Ambulatory Pediatrics)

Individuals and Others: Student Learning Through Reflection and Collaboration

Instructor and student participants discussed how learning as an individual and learning in collaboration affected a student's ability to progress towards an embodied use of movement in practice. Three strong positions were clear in the discourse (see Figure 4.7). First, students rarely gain an embodied use of movement in practice when learning as an individual. However, when students engaged in deep reflective activities about their experiences, their ability to integrate movement use in practice was impacted. Finally, there was consistent agreement that embodiment could best be achieved through learning in collaboration with others.

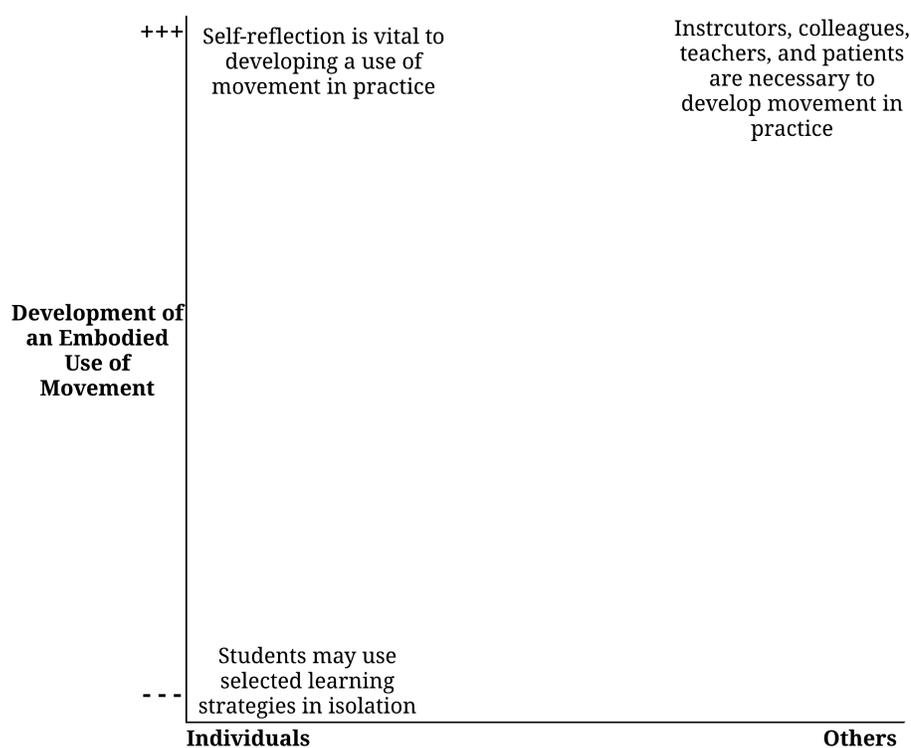


Figure 4.7. Positional map depicting the dichotomy of learning in isolation or collaboration and its effects on movement use development.

Learning individually. There was minimal evidence of attempts to learn movement use as an individual. One participant used visual imagery. She stated that sometimes she would close her eyes and imagine her moving the patient's body and try to imagine how her hands would move and how her own body would feel. During observations, several students could be seen moving their hands or body in a mimicking fashion while observing their instructor working with a patient. Both of these examples of learning movement as an

individual were temporary attempts to consolidate knowledge in the moment. They were not viewed as a strategy for attaining an embodied use of movement.

Learning through reflection. Some students and instructors, however, did articulate an individual strategy for effectively integrating movement into their practice. Though variable in how they were discussed, individual reflection was the common theme of this position. Instructors and students who found ways to deeply think about what they had observed, heard, or experienced remarked that they were able to use that information later and apply it to different patient experiences.

I went home and wrote down a lot of stuff. Just the act of writing just helps me remember it...A lot of things that I wrote down were just ideas, just like, um, different ideas for how to hold a child while you're accomplishing what you need to accomplish, because doing a hamstring stretch in supine does not work 90% of the time with infants. They just won't tolerate it. So figuring out if you can have Mom hold the child on her lap or if [my instructor] was there with me, because she holds him while I'm doing the stretch. Um, where are we going to play with the toys, things like that to distract? So those are all ideas like to kind of that I had to write out, because that's just me. (Student, Hospital Pediatrics)

Learning with others. Most important in integrating movement use in practice was collaborative learning. Everyone agreed that colleagues, mentors, other students, and other professionals each had something unique to offer when learning to use movement in practice. Students relished the opportunity to spend time with other clinicians, and instructors found

great value in the opportunities for students to see different movement use strategies in practice.

So I think [students are] very receptive to learning from several people, and I always try if I'm going to be out for some reason from the clinic, to be sure that they've had a chance to be with, if possible, every therapist that we have, because I feel like, you know, we just have a lot of really talented therapists here, and they're going to learn something different from every therapist. And I just tell them that. Just like, "You're going to do this with this many people, and you're going to learn something from each of them. I mean there probably won't be much contradiction, but each of them will have a gift to offer." (Instructor, Ambulatory Pediatrics)

Developing Movement Use through Learning Independently or Learning by Mimicking

Instructor and student participants consistently discussed optimal ways for students to learn movement use in practice. Two methods were consistently discussed as beneficial. Mimicking the instructor's use of movement after observation or with the instructor's hands placed over the hands of the student was seen as an effective way to learn to apply movement strategies in treatment. Additionally, learning independently was considered a successful strategy for integrating movement in practice. Though there were two consistent methods discussed, students and instructors held a variety of positions on the effectiveness of these methods (see Figure 4.8).

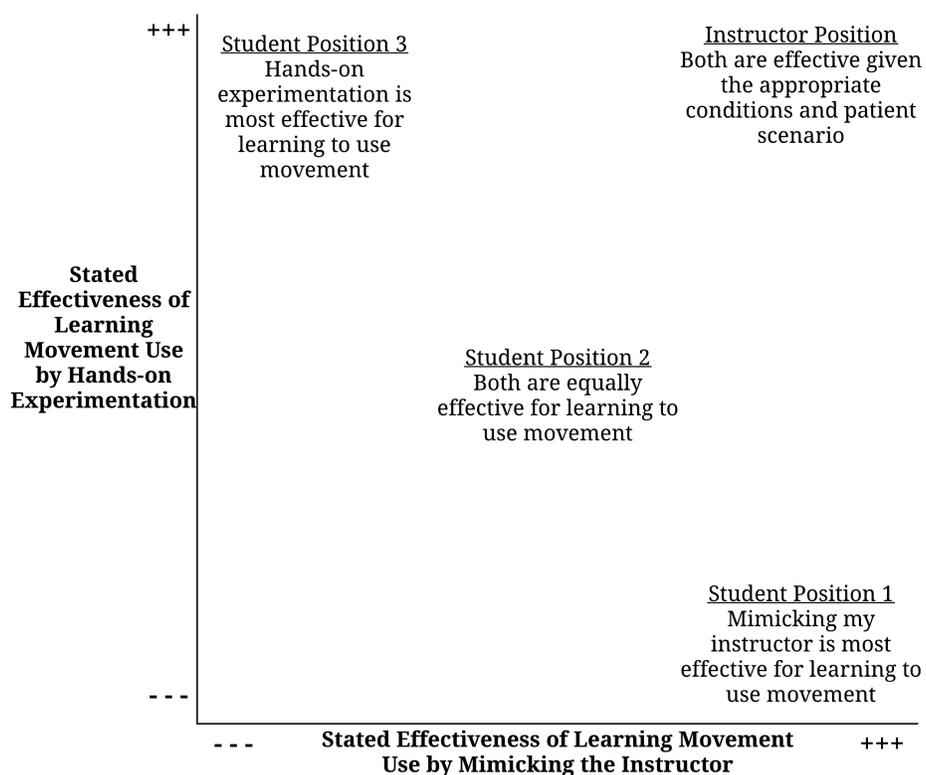


Figure 4.8. Positional map depicting student and instructor perceptions of learning strategies for developing movement use in practice

Student positions. Students ranged in position believing hands-on experimentation was optimal, mimicking was optimal, or each were equally valuable. Students who believed learning through experimentation was most helpful felt that they had to feel and respond to variability in the patient without the input of the instructor in order to fully integrate a use of movement in practice. Only through this freedom, could they really progress their own use of movement.

[My instructor] would throw me into it, and like “All right. You do whatever you want in 20 minutes. And then she would watch. And so she would let me do what I was going to do for a couple of minutes, and then if something wasn’t working or I asked her about something, she would come in and adapt whatever needed changing... So it builds your confidence doing something like that and seeing, knowing that you’re on your own, and if something works that it was you. It was something that you learned before that you could take and put into practice on your own. So that was really good and then confidence building once you got it to work, once you got past the frustration. (Student, Ambulatory Pediatrics)

Other students felt as strongly that the most effective way to learn movement was through mimicking their instructor. They would carefully observe each action during their instructor’s sessions with patients. Often they would ask thoughtful questions and request that the instructors demonstrate on the students’ body so they could feel it. Finally they would perform the movement with the patient, often benefiting from the instructor’s hands placed over their own. One student had a very practical explanation for why mimicking in this setting was most valuable for her learning:

I think in this clinical it was a lot of watching. Um, but it was because, you know, [my instructor] and I were not very far off from being the same size. Um, so it was a little bit easier for me to say, OK, if this works for her—we have generally the same length arms, generally the same height. She’s a little shorter, but um, it was easier to

watch and see what she was doing, and the way she was doing it, and apply that to me... (Student, Hospital Pediatrics)

At other times, students could see the benefit of both learning strategies. This position recognized that value was not in a certain learning strategy but instead placed importance on how one thought about what was being learned. More experienced or mature learners tended to hold this position.

I think both are useful. I think that the observation and then implementing is a faster way to learn, but it's—I don't know that it is as much of a solidified learning that's going to stay there as long if it's something that you're forced to kind of process through and think about to come up with a solution. I feel like what I will remember and walk away from more so with the interaction is what we came up with when we had to think through and why we were doing it, and kind of the whole process behind it, versus she did it that way so that's what I'm going to do. (Student, Ambulatory Neurology)

Instructor positions. Instructors provided two positions. First was a position that students needed the opportunity to learn through their own experimentation but first needed a strong foundation that was best achieved through observation and mimicking.

...they need to know what to do. They're dealing with a patient. You know, they can't just go in there willy nilly so I think I try to uh, I think I generally try to do the modeling and speak through things, and then once they have [watched, they] at least know what pathway to follow. (Instructor, Acute Rehabilitation)

Secondly, instructors expressed a position that either strategy was optimal given the individuality of the scenario. At times a student needed to watch then mimic. While at other times it would be best for learning if the student engaged in experimentation and learned through trial-and-error. The experienced instructor made these decisions in the moment based on the patient's demeanor, the treatment task at hand, the frustration level of the student, as well as an infinite number of other factors. Once combined, these factors led to an individualized approach to teaching and learning in the moment.

Developing Movement Use by Observing: Instructor Hands Versus Patient Response

During the data collection process an interesting discourse emerged about the ideal target for observation when learning to use movement. Watching the patient's response to the instructor's treatment captivated all students. However, some students realized that in order to learn to use movement, they had to divert their attention to the instructor's hands. There was variability in positions about whether it was best to watch the instructor or the patient (see Figure 4.9).

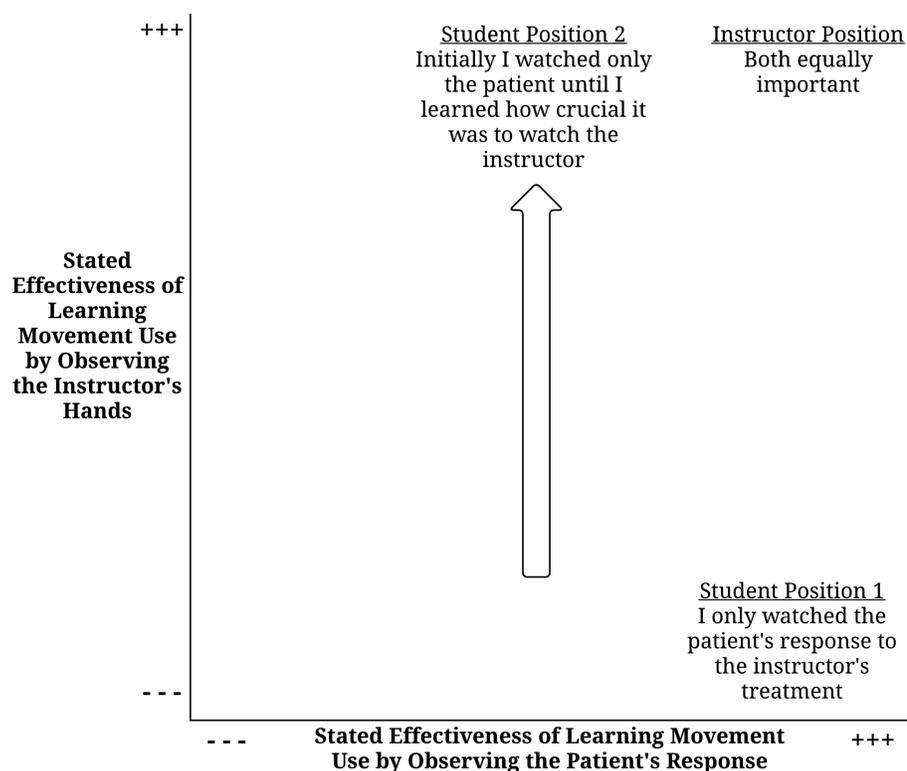


Figure 4.9. Positional map depicting student and instructor perceptions of observation strategies for developing movement use in practice

Student positions.

The student watched the patient intently. She wanted to know how she moved, how she struggled to move, and what motivated her to move. She also watched the patient's facial reactions as an indication of his pain, frustration, or excitement. All the while, the student listened to her instructor's explanation of what she was doing to produce the patient's movement. When the instructor was finished, the student eagerly asked if she could try. She sat down beside the patient, placed her hands in the same general area the instructor had placed her own, and began to work with the patient.

As illustrated in this vignette, I observed that some students rarely looked at the

therapist's hands. It is unclear if they were so captivated by the patient and the patient's experience that they couldn't divert their attention, if they had been well-trained by their didactic experience to focus their full attention on the patient, or if they discounted the benefit of watching their instructor. The second student position indicates that the later may be the case.

Students may have never realized that they should watch the instructor's hands and body. This seemingly obvious reaction to learning movement is apparently something that some students needed instruction in order to do. Students without instruction may persist through days or weeks of the internship without realizing that watching the instructor may be beneficial.

I think in the beginning I was more focused on observing the child and what their movement was in response to the touch. But towards the end when I knew the kids and I knew what they were doing, I focused more on what [my instructor] was doing. And watched her more probably more than I watched the kids...[initially], had [my instructor] said watch me instead of watch the child, I would have thought she was kind of crazy. But had I had that before coming in here and like had a trial-and-error period where I really did get to do a lab with children where the therapist was who we were watching and not the child, um, I think that would have made it a more easy transition and more quick to kind of pick up on the this really subtle detail of movement that you won't notice if you were just watching the child. It's easy to pick

up on the gross movement pattern, like what it is they're doing, but then those really subtle details don't pop out at you. (Student, Outpatient Pediatrics)

Instructor positions. When asked which observational method they found most effective, instructors had to pause and reflect. Observing movement clearly was a tacit activity for them. Consistently, instructors reported that when learning about movement use, they watched the therapist's hands and the patient's response simultaneously. However, when teaching, they first watched the student's hand placement or body positioning and then watched the patient's response to the student's treatment. Though they watched them in sequence, instructors felt there was equal importance in where the student should place his or her attention. None of the instructors, however, had ever previously discussed with students how to observe movement use in practice.

Markers of Emerging Embodiment in Movement Use

The final positional map depicts instructors' perceptions of their students' emerging embodiment of movement use (see Figure 4.10). Instructors discussed three markers of progress that they expected to see in their students. Initially, instructors expected to see students' ability to successfully perform movements targeted at promoting a specific response in the patient. As the internship progressed, the instructor expected the student to improve in his or her ability to describe his or her own movement. This description may be in the form of discussion with the instructor or as education to the patient or his or her family.

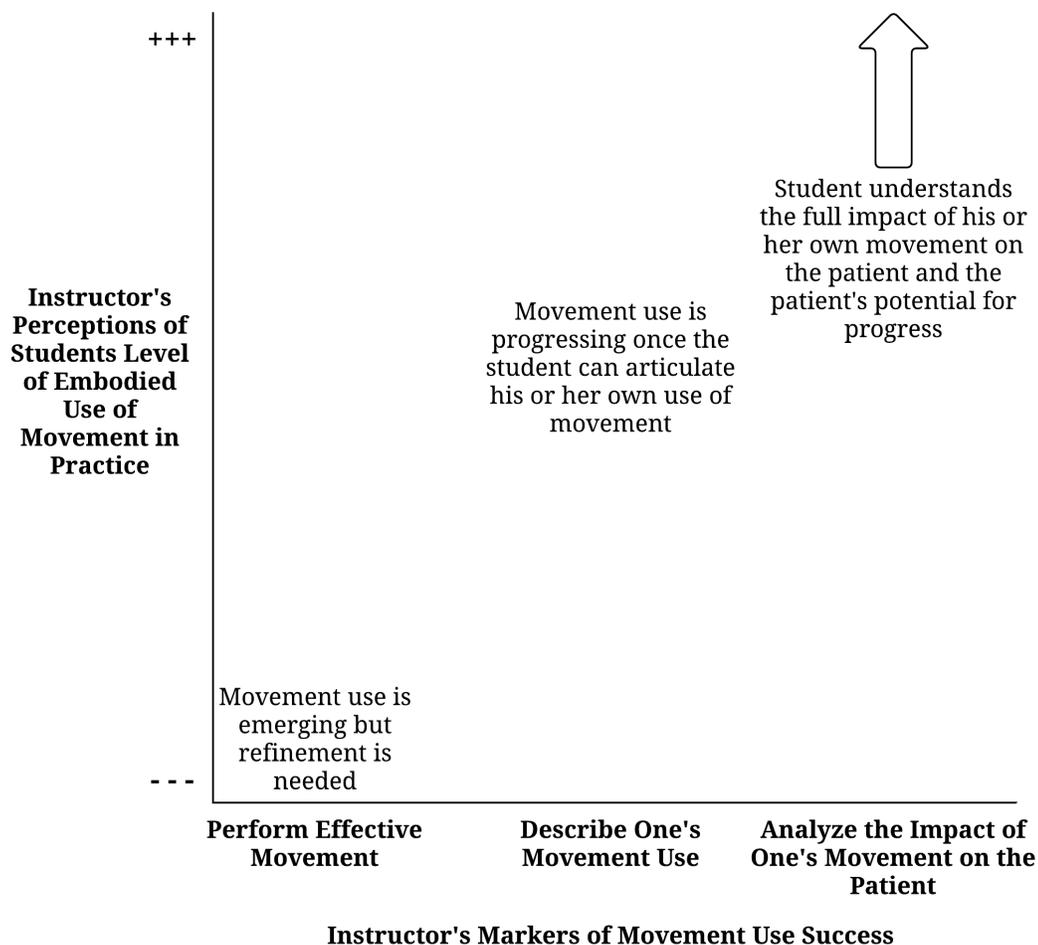


Figure 4.10. Positional map of instructor's perceptions of students' emerging embodiment of movement use as measured by their abilities to perform, describe, and analyze movement.

Where she did well with kind of standing back and observing in the beginning, but then wanted to get her hands on and practice with guidance from me. And then transitioned to not only independent handling skills, but teaching the handling skills to the family as part of the home program. So to me that showed a nice progression of her ability to um, process the information, and then try it out. She was open to

feedback from me and then she was able to kind of reproduce that and teach it to patients and family members. (Instructor, Ambulatory Pediatrics)

Ultimately, instructors expected to see students demonstrating the ability to articulate how their movement impacted the patient beyond the immediate effects seen in treatment. Instructors indicated that once the student began to show this marker of improvement, he or she would progress towards an embodied use of movement in practice. Here a student articulates how her own movement use impacts patients.

With movement it really taught me you can do the exact same thing with two different children, and get totally different results. So what works for one is definitely not always going to work for the other, but it's going back to kind of like the dance analogy. You have to alter it so that you can get the best performance for all of them, and figuring out what it is you need to alter isn't really that easy. So but once you can adapt like learning the general skill, and then being able to adapt it to different children, so they might not need the exact same thing, but you can change it. And figuring that out and processing that was really helpful I feel like. (Student, Ambulatory Pediatrics)

The positional maps each provide a way of examining the discourses important to teaching and learning to use movement in clinical practice. As can be seen, the positions taken by students and instructors are highly variable, context dependent, and fluctuate with experience. Now that I have examined the important categorical details of the situation and

studied the different positions of the actants within the situation, I turn my attention to considering the broader social impacts on learners in the clinic.

Social Worlds / Arenas Maps

Facilitating Movement Use in the Physical Therapy Professional Arena

Utilizing the process outlined by Clarke (2005), I created a social worlds / arenas map (see Appendix H). The intention of this map was to examine the various sociologic and nonhuman influences on the instructors' perceptions and facilitations of movement in their students. Three social worlds were included in the map. First, the learning triad of the student, instructor, and patient indicate the central focus of movement use development. This social world is situated within the second social world of the clinical setting. The third influential social world included the instructor and mentors. This world was situated within the professional arena of physical therapy. The professional arena also included the family of the patients, previous experiences of the student, the academic program arena, and clinical specialty practice arena. All of these social worlds and arenas are part of the united healthcare system domain.

The social worlds / arenas map provided an exercise in considering the hierarchical layers that are associated with learning in physical therapy. However, because the discourse in the data centered entirely on the learning triad between the student, therapist, and patient, there were no well-supported significant findings from this map that reflect novel information in academic physical therapy.

Conclusions

In this chapter I presented the findings from an extensive situational analysis of how physical therapist clinical instructors facilitated students' integration of movement into the students' emerging practices. After gathering and coding qualitative data from interviews, observations, and document analysis, I used three types of situational mapping strategies to make sense of the data: situational maps, positional maps, and a social worlds/arenas map.

First, I used three distinct situational maps to categorize concepts that were found frequently throughout the data. In the first situational map, I examined concepts in the data related to Dall'Alba's four professional ambiguities and their association with embodiment. Next, I used a second situational map to depict the various teaching and learning strategies that instructors employed when helping students to integrate movement into their practices; I then categorized these strategies according to potential common outcomes. Third, I produced a situational map to model the influential relationships among the primary actants within the teaching and learning situation.

With a greater understanding of the concepts that appeared often in the data, I was next able to generate seven positional maps to depict the important discourse. These maps allowed me to analyze the various positions of the students and instructors as they related to important ideas found throughout the data. Each of the first four positional maps examined one of Dall'Alba's professional ambiguities and its influence on the students' ability to embody movement in practice. The final three maps each examined other key positions throughout the data. These three maps depicted the debate around the optimal way to learn

movement, the primary visual target for students when learning movement through observation, and finally the instructor perceived markers of success in developing their movement use.

After examining the key concepts and positions within the data, I used a social worlds/arenas map to consider the broader influences of society and the profession on the learning situation. Although this map proved to be an effective exercise for considering how the participants used movement in their clinical practice, the map did not generate new insights because the participants' discourse centered on the student-instructor relationship.

All mapping strategies proved useful in elucidating the concepts and positions relevant to instructors facilitating students' use of movement in practice. In the next chapter I will further discuss important findings and their supporting themes revealed in this situational analysis.

CHAPTER 5

DISCUSSION OF FINDINGS

This situational analysis study of physical therapist clinical instructors and their students focused on how instructors perceived and facilitated their students' use of movement in clinical practice. Using data from interviews of the instructors and students, observation of the participants working in patient care, and review of the students' formal written assessment, I created situational, positional, and social world/arenas maps that revealed important findings about how the instructor and student interact to facilitate the student's use of movement.

Analysis of the maps reveals three key findings supported throughout the data by five themes. First, *clinical instructors must establish a learning environment supportive of students' unique needs*. The clinical instructor accomplishes this by two themes which emerged: (a) they *adapt* to students' individualized reactions to learning movement in the clinic; and (b) they help the student *prepare* to learn movement use through early introductory observation and experiences with movement. Second, *clinical instructors must be intentional when teaching students to use movement in clinical practice*. This intentionality is demonstrated in two themes as the clinical instructors (a) use a variety of carefully selected teaching strategies to *enhance* student learning; and (b) as they facilitate students to *connect* key concepts of movement use to patient outcomes. Third, *clinical instructors play a vital role in establishing a foundation for students' trajectory of movement-related professional growth towards expertise*. This is evidenced in the findings'

theme as the instructor promotes *development* of students' unique philosophy of movement use. This chapter will discuss each of the three key findings and their corresponding themes in detail, illustrating each with constructed vignettes from the study's interviews, observations, and documents. Furthermore, relevant literature will be discussed as it pertains to this study's findings.

Finding 1. Instructors Must Establish a Learning Environment Supportive of Students' Unique Needs

This study revealed that physical therapist clinical instructors must establish a learning environment built to support their students' unique needs in order to promote students' use of movement. This is accomplished as they *adapt* to students' individualized reactions to learning movement in the clinic and as they help the students *prepare* to learn movement use through early introductory observation and experiences with movement.

Instructors in this study had extensive experiences working with students in clinical internships. They recognized a need to create a learning environment that would be conducive to the students' success. However, to create a learning environment capable of supporting students' unique needs, the instructor must first work diligently from the outset to build trust and communication between himself or herself and the student. All participants, students, and instructors discussed the importance of building and maintaining a trustworthy relationship in order for the instructor to be effective in responding to students' needs.

On the first day of her pediatric ambulatory internship, she felt uncertain of her ability to safely handle the children. Each child had very complex medical issues which manifested in limb dysfunction or deformity, and, often, communication challenges. Despite her uncertainty, the student was determined to appear confident and eager to learn. When her instructor asked her to hold the first patient of the

morning, a six-month-old infant girl, the student cautiously stood up and reached out her arms to take the child. As soon as the child was in the student's arms, the instructor grasped the student's hand, moved it higher on the child's back, then placed a hand on the student's hip and indicated the student should sway from side to side. The student, unaware of the importance of these movements, nodded at the instructor. The instructor looked at the student and said, "Tell me how the baby feels in your arms." The student thought for a moment, and then a lengthy verbal exchange between the instructor and student commenced, discussing the student's positioning, its effect on the baby's muscle tone, and how the student could adapt based on the baby's motor responses to the student's movements.

The study participants repeated this vignette in various formats during the first days and weeks of each student's internship. Not only was this scenario meant to begin early instruction about patient care and movement, instructors sought to build trust between themselves and their students. Students needed to feel the instructor's trust in them in order to establish a learning environment that would allow them to experience and understand movement use. Instructors who allowed students to engage in patient care, ask questions, and dialogue openly about their apprehensions in movement use, built this trust quickly at the beginning of the relationship. When students felt they could ask their instructors any question and the instructor would listen and thoughtfully respond, they believed trust existed in the relationship.

In order to build trust, the instructor needed some assurance of the student's competence. Through these early exchanges in movement use, instructors assessed students' maturity and readiness to learn, which in turn built the instructor's trust in the student for future, more complex patient handling and movement use. Hayes, Huber, Rogers and Sanders (1999) found that instructors were more likely to question the competence of their physical therapist students when they demonstrated decreased skill or knowledge, displayed

unprofessional behavior, or poor communication skills. Conversely, authors have found that instructors gained a positive “gut feeling” that students could be successful when they displayed attributes of knowledge, skill, safety, clinical decision making, self-directed learning, interpersonal communication, and professional demeanor (Jette et al., 2007, p. 833). In a separate study, students were shown to believe the most important attributes in clinical instructors are, first, good communication skills followed by interpersonal relations and teaching ability (Emery, 1984). Interestingly, students in this study found professional skill and behavior as the least important necessity of a good clinical instructor (Emery, 1984). Though Emery’s work is dated, the results were reflected in this study. Students relied heavily on the instructor’s communication and interpersonal and teaching skills to build trust and rapport. Students felt that without these skills, learning the movement skills from their instructor was much more challenging. Likewise in this study, instructors relied on the students’ demonstration of professionalism and skill to build trust and a foundation for responding to the students’ needs.

Once a foundation of trust and communication was established, clinical instructors were able to further build a supportive environment for learning by understanding the student’s unique needs as a learner. To create a learning environment truly conducive to integrating movement use in practice, the instructor needed to *adapt* to the students’ unique needs and *prepare* the student to learn to use movement in the coming internship.

Clinical Instructors Adapt to Students' Individual Reactions to Learning

Adapting to the student's previous experiences. In order to tailor the learning environment to meet the students' unique needs, instructors had to know about student's individual experiences both inside out outside the classroom. Instructors were keenly aware of the student's experiences in the classroom or with sports, arts, and other extracurricular activities. The instructors knew what interested the students, what motivated them to learn, and what activities, both professional and otherwise, their students found exciting. This understanding of their students served a dual purpose. By acknowledging the individuality of their students, instructors initiated the important process of building rapport. The instructor also sought to understand how the student learned, the experience he or she had with movement in the past, and how he or she had been successful in those past experiences.

The clinical instructor did not have all of the responsibility for creating an effective learning environment for movement use. The student's previous experiences played a vital role in enhancing the learning situation and enabling optimal integration of movement into their emerging practices. This vignette demonstrates how instructors sought to understand students' experiences to best adapt to their learning needs:

The physical therapy student had been a varsity athlete in high school and played club sports throughout his undergraduate career. Various experiences with injury and rehabilitation had led him to a career in physical therapy. Though his personal experiences with injury had all been orthopedic, he had an aunt with multiple sclerosis. Now, in his fourth week at his ambulatory neurologic internship, his instructor assigned him to evaluate a young woman with a diagnosis of multiple sclerosis. Her history indicated she had once played competitive basketball. Before starting the evaluation, the instructor asked the student to discuss his knowledge of multiple sclerosis and its predicted implications on his patient, given her history and level of activity. The student drew on his knowledge from his neurologic practice

coursework, his aunt's history of the disease, and his own background in sports to discuss in detail his predictions for the upcoming evaluation. The instructor and student also began to discuss how the student may adapt some common treatment strategies to simulate basketball training drills in an effort to motivate the patient.

In this study, there was agreement among instructors that students who had movement related experiences prior to their physical therapist training displayed comfort levels using their hands and bodies in patient care that allowed them to progress more rapidly than their counterparts. Some instructors described past students who had been athletes or dancers, indicating these students were more comfortable with their own bodies, had greater ease using their body in conjunction with the patient, and more readily altered their own movement when instructed to do so.

Student participants in this study also indicated that their experiences prior to physical therapist school or prior to the clinical internship played a key role in their ability to learn to use movement. Some students discussed their ability to interact and assist patients based on prior movement related experiences as an athlete, while other students more readily tied their success to experiences in the didactic portion of their training. Some students seemed deeply impacted by experiences they had in the classroom and laboratory at their training institution. Students discussed the corrective techniques their faculty had employed in skills laboratory sessions where students practiced movement on one another. The careful attention, correction, and direction of their faculty had enabled them to be more successful treating the patients during their internship or in correcting their own movement when instructed by their clinical instructor. Others described brief patient experiences facilitated by their faculty in the class or laboratory rooms that gave them early opportunities to try to use their hands and

bodies to effect change in actual patients. A few students, who had previous clinical internships, also described the benefits of early clinical education experiences for enhancing their ability to integrate movement into their practice later in the training process. Even if these early experiences had been in different practice settings than the current one of study, students felt the ability to use their hands and body under close supervision and careful instruction enhanced their growth no matter the practice setting.

It is well accepted that adult learners use past experiences to enhance their learning and ability to integrate knowledge and skill into practice (Knowles et al, 2011). What is less understood is how physical therapist students use their previous experiences using movement through sport, dance, classroom training, or clinical experiences to promote their abilities to use the movement of their hands and bodies to treat their patients. Though there is growing understanding of how therapists influence their patients' movement awareness (Edwards et al, 2006; Skjaerven et al, 2007, 2010), there remains little literature about how physical therapist clinical instructors assist their students to harness and understand the movement of their own body and its influence on their patients.

Instructors in this study agree that students with previous movement related skills and knowledge are more likely to excel in using movement during the clinical internship. However, none of the participants routinely used the student's previous skill or movement awareness in a formalized attempt to facilitate or hasten their ability to use movement with their current patients. Students, likewise, recognized that the previous experiences they had with movement, personal relationships, and knowledge gained about movement in the

classroom were important for shaping their experiences. However, there was no overt adaptation on the part of the instructor to include these past experiences in meaningful ways as the student learned to use movement in the clinic.

Adapting to the students' emotional responses to learning movement. Given that learning movement is complex and ambiguous, often students were unable to express their learning needs verbally. Instead, their apprehension, concern, and confusion were expressed through emotional responses to the learning situation. Students in the study ranged in their emotional response and willingness to engage in the learning process. Students' emotions and engagement were influenced by a number of factors, including confidence in their own knowledge and abilities, feelings of trust in their instructor, and their perceptions of the instructor's trust in them. Students became frustrated when they could not reproduce effects in patients garnered by their instructor's movement. Conversely, they were elated when they realized they could readily and consistently produce movement that garnered the intended outcome he or she had planned with his or her instructor. The effective instructor was able to adapt to differences in his or her student's emotional state and channel the student's emotional response in learning movement through effective feedback, alteration of their responsibilities in patient care, or by offering progressive challenges.

The student had watched her clinical instructor transition the young boy from a prone position to sitting on top of the four-foot diameter therapy ball many times. They had discussed the benefits for the ball for promoting muscle tone in the boy, who otherwise lacked it throughout his body. However, each time the student tried to complete the same movement with the boy, she got more and more frustrated. She could not get the boy into a seated position without struggling to control the large ball or feeling like she was going to drop the child. Though she had practiced it many times, she wasn't improving. Her instructor, sensing the student's frustration,

would take over, demonstrate again, explain movements, and return the patient to the student. The student, feeling like she had no better idea of what to do, would try again, only becoming more frustrated.

This vignette demonstrates a typical emotional response to learning movement encountered by the study's participants. In this situation, however, the clinical instructor is not able to adapt well to the student's individual needs and instead continues to try and teach the student by demonstrating and describing in the same way over and over. The student in this vignette yearns for feedback about her own performance. Watching and hearing the instructor is not enough. She needs to know what, specifically, she is doing wrong and how to change. Jarski, Kulig and Olsen, (1990) found that physical therapist students perceived that the most helpful teaching behaviors pertained to providing information through feedback. Conversely, students indicated the least helpful teaching behaviors included questioning with intimidation and correcting errors in the presence of patients (Jarski et al., 1990). These results may not be fully reflected in this study, as student participants learning to use movement wanted immediate feedback to correct their form and improve their use of movement. Student participants in this study never faced intimidation from their instructors. However, when faced with stress, frustration, or an instructor's poor communication about movement, students displayed an emotional response

In this study, students' emotional responses to learning to use movement may often have been the result of incongruity between their didactic learning style and an unknown or unrefined learning style for movement use as demonstrated in the vignette below:

The student quietly and carefully observed his instructor helping the patient balance on his injured foot. The patient required assistance to maintain his trunk and keep it

from collapsing forward as he put more and more weight on the weak foot. The student studied exactly how the patient moved, how he reacted to bearing more weight on the weak foot, and what he said during the exercise. He jotted notes, quickly on his clipboard. When the instructor asked him to try, the student requested to watch one more time. Instead the instructor stepped back and told the student to try.

Most student and instructor participants noted that students tended to have a prevailing learning style that had always been effective for them during didactic experiences. However, when faced with learning to use movement, their preferential learning styles may not be as effective. In the vignette above, the student had likely had success learning by observing and listening and felt most comfortable when he had watched something many times. In contrast, the instructor knew that to learn to use his hands to help the patient, he would have to be actively involved in the patient care. Students were often unaware of this need to shift learning styles and required assistance from their instructor to make this change. Instructors who were responsive to the needs of the students and could offer suggestions to help students try learning in different ways found greater success with their students.

As described in the vignette, the student focused on watching the patient's response. Some student participants in the study articulated this need simply by discussing how they did not know what to watch to learn movement use. Clearly in the classroom this had never been a challenge as it was always obvious where they should direct their attention to learn didactic material. However, in the clinic they needed guidance early on from instructors about where their eyes should be focused to best understand and learn movement use.

Clinical instructors should adapt to the needs of their students by directing them on how best to direct their attention and efforts in order to learn to use movement. Occasionally,

students in this study became very frustrated when they felt their instructor was not able to assist their needs as learners. This frustration stemmed from students' inability to understand what they needed or how they should progress in their movement use. This was compounded by their feelings that what the instructor was doing was not helpful. As students are unable to understand the complexity and ambiguity of movement use, they are often unable to independently adapt their learning style to accommodate integrating movement. Instead, the instructor must be able to adapt their own teaching style and communication to help the student learn to use movement in practice. This may mean the instructor must learn to describe their use of movement more directly or succinctly. The instructor may need to allow the student to try to use movement without interfering with additional description or constant feedback in an effort to let the student think through the process without distraction.

Henderson et al. (2006) provide a conceptual model for responding to the learner's needs and progressing professional development in clinical education. The three-part model consists of partnering, learning, and progressing. The authors indicate that partnering creates a positive and trusting relationship on a personal level required for learning in the clinic. This trusting relationship occurs within a broader professional and social context. Once a partnering relationship has been built, learning occurs through collaboration in which the experienced clinician assists the novice to make sense of complex knowledge and skill and integrate it into their current practice. To respond in this manner, the authors point out, the instructor must be knowledgeable about the student's "existing knowledge level so that the activities and accompanying discussion assist in making connections between theory and

practice” (Henderson et al., 2006, p. 104). Through partnering and learning, a safe context is formed that allows students to practice and make their own connections in learning. This furthers discovery through “experiences, feelings, [and] attitudes, leads the learner to ‘progress’: the development of knowledge” (Henderson et al., 2006, p. 104).

Physical therapist students learning to use movement often faced confusion, frustration, and an inability to articulate their needs as a learner. Instructors must understand that these emotional responses to learning movement may be typical and born of the students’ inability to know how to alter their learning styles to meet a new challenge in integrating complex and ambiguous skills into their practice. To combat the student’s frustration, the instructor must be prepared to partner with the student in an effort to build a trusting relationship with good communication. The instructor must next be ready to adjust his or her own teaching and communication methodology to adapt to the learner’s needs and facilitate understanding and practice of movement related skill. With a trusting relationship and an adaptable approach to teaching, the clinical instructor will be best able to respond to the needs of the learner and initiate a pathway towards the students’ embodiment of movement use in their physical therapist practice.

Clinical Instructors Prepare the Student for the Complexity of Movement Use

The clinical instructors recognized the need to prepare their students for the learning that would be required to work with patients in each of their clinical settings. As seasoned instructors, they realized the students came to this internship with a variety of personal experience, knowledge about patient care, and potentially previous practical experiences

treating patients. However, the instructors recognized that the students had not learned or treated patients in *this* environment. Each instructor recognized that the setting, no matter the student's previous experiences, would be new to the student. The novelty of the setting, then, required the instructor to engage in a process of preparing the student to use the movement necessary to facilitate change and restore the health of the instructor's patient caseload.

As the instructors gained knowledge about their students' unique experiences and learning preferences, they began the complex process of introducing the student to movement use in their clinical practice. Still, however, before the instructor could expect the student to progress in their movement use, they had to prepare them to feel, use, and understand their body in clinical practice. Instructors used a myriad of techniques to accomplish this. Some instructors asked the student to spend the first days carefully observing them in patient care. Following these periods of observations the instructors engaged in conversation about what they were feeling, why they were moving the way they were, and what they hoped to gain through their movement choices. These periods of observation were relatively brief, as the instructors quickly moved students into experiencing movement themselves.

On the first day of his inpatient rehabilitation internship the instructor asked him to greet his patient, an elderly lady who had suffered from a massive stroke leaving the entire right side of her body motionless, her face drooped on one side, and her speech garbled. Next, the instructor asked the student to move the patient's right leg and describe exactly what he felt and then repeat with the right arm. Now the instructor moved in front of the patient, told the student to watch, and swiftly but carefully positioned his own body to move the patient from lying to sitting on the edge of the bed. The instructor described for the student what he had just done, laid the patient carefully back on the bed, then asked the student to safely sit the patient up again.

Preparing through safe movement. As described in the vignette, instructors typically began preparing their students to use movement by carefully educating the student on safe movement strategies for their patient populations. The need to discuss, demonstrate, and confirm the students' understanding of safe movement and patient handling served more than a mechanism for ensuring the patient's safety. By acknowledging the ways in which safe movement occurred with patient care, the instructors formed a contextual basis for the students' understanding of how and why to move in specific ways with their patients.

Instructors asked students to touch patients, move limb segments, or provide safety and guidance to a patient while the instructor provided the majority of the effort in treatment. Instructors asked students to explain what they were feeling and asked questions that prompted students to consider not only how the patient felt beneath their hands, but also what effect their hands were, in turn, having on patients. Very early in the internship instructors insured that students could begin to realize the importance of this cycle of feeling and affecting the patient through touch and movement. Instructors often used questions like, "What you are feeling?", "Do you feel comfortable?", "Do you think the patient feels comfortable?", "What is going wrong with the patient's posture/position/movement?", "Where is your hand?", "What are your hands doing?" These questions enabled students to begin to understand the importance of their hands and body placement and build awareness that their hands had a significant role in helping the patient but that the patient ultimately determined the role of the students' movement through their response and action.

Preparing by reducing cognitive load. From the very first day of the internship, instructors engaged in robust conversation about their patients, their treatment decisions, the movements they were electing to use, and the intended outcomes of their decisions. These early and intense discussions were generally unidirectional. The instructors were the predominant voice as students listened, nodded, occasionally jotted a note, and attempted to take in as much as they could hear and see. Often the instructors' attempts to prepare the student for movement use left the students overwhelmed and confused. Despite the students' feelings of confusion, the large volumes of early information seemed a necessary part of the students' ability to begin to integrate factual knowledge and the instructor's tacit wisdom into their emerging practice. Instructors often recognized the student's levels of early frustration and feelings of being overwhelmed and would temporarily decrease the amount of information they were discussing. Most students agreed, however, that better strategies were needed early on to prioritize the oral discussion and to draw tighter connections between what the instructor is saying, and what he or she needs the student to know and do in those early days and weeks. Instructors who were better able to connect their discussions with application may have had students who were more ready to learn and use movement.

Instructors sought to prepare their students for the coming challenges by describing each and every detail of their movement decisions. By providing high amounts of information and constant expectation, the student may not be able to as effectively integrate the skills and knowledge the instructor hopes they can, as they often become overwhelmed and frustrated. Clearly the instructors in this study relied on a phase of preparation to ensure

the students were best prepared to meet the challenges that would come later in the internship. What is unknown is if the instructors in this study could have better reduced the cognitive load on the students early on to promote a smoother transition to understanding the complexity of movement use.

Recently authors have begun to discuss the impact of cognitive load on students' ability to effectively prepare for the clinical learning situation (Austin, 2013; Pociask, Morrison, & Reid, 2013; Schumacher, Englander, & Carraccio, 2013; White, 2011). These authors take a neurologic approach to understanding how memory works and considering how a students' brain manages different realms of incoming information and attempts to store pertinent information to be retrieved for later use. By decreasing extraneous information and carefully managing the key facts necessary to the learner at the moment, learning will be optimized and the novice will more readily progress in their ability to integrate complex skills (Austin, 2013).

White (2011) provides a simple five-phase approach for the clinical instructor to employ when working with a student early in an internship to prepare them for more complex skill development later on. In the first, or overview phase, the instructor explains why a specific skill is needed and how it is to be used in the delivery of care. Second, the instructor silently demonstrates this skill to provide the learner with an image of what was just described. Third, the instructor repeats the demonstration and narrates by describing the process in detail. Fourth, the learner attempts the skill while simultaneously describing what he or she is doing. The instructor may also perform the skill simultaneously or assist the

learner. In the fifth and final phase, the instructor continues to guide the student's development through feedback and coaching as necessary.

White's (2011) method for combatting cognitive load in the student may be an effective strategy for instructors to use when preparing the student to develop an embodied sense of movement use in practice. In this study, instructor participants used a variety of strategies to prepare their learners. However, there was no systematic method for integrating the students' learning needs and experiences and introducing the foundation necessary to ensure later success in learning movement use.

Discussion of Finding One

This study found that instructors must establish a learning environment supportive of students' unique needs as they learn to use movement in clinical practice. The foundation to this is a relationship built on mutual trust between the student and instructor with effective communication skills. Once trust and communication exist, the instructor is able to continue to build a supportive learning environment by adapting to the student's individual needs. The unique needs of the student grow from their past movement-related and classroom knowledge. Though these past experiences play a significant role in the student's ability to integrate movement into practice, instructors do not routinely structure learning experiences that overtly acknowledge the student's experience and integrate it into patient care.

As students began to encounter the complexity of movement use in their treatment of patients, the instructor must be ready to adapt to the unique emotional responses the student may exhibit to the stress or frustration he or she encounters. Instructors are best able to adapt

to students' emotional responses to learning through effective feedback that addresses the students' concerns and by offering suggestions to help focus students on the aspects of learning movement most important to the instructors' practices.

As instructors adapt to the learning needs of their students, they must begin to prepare students for the further complexity the students will face as they integrate movement into their practice. This is accomplished by establishing early learning experiences that further the trust relationship, ensure safety in the students' ability to use their movement in patient care, and gain more experience with how to use their hands and body to work with patients. As instructors continue to prepare students for learning movement use, they must be careful not to overwhelm students with information that may reduce their ability to learn. By carefully structuring and pacing their instruction and teaching strategies, the instructor may be better able to draw out the salient concepts of movement use the student needs early in the internship to be prepared to progress.

This finding demonstrates the importance of clinical instructors' ability to perceive the needs of the student. Learning to use movement in practice is complex and ambiguous. The instructor must be perceptive, discovering students' needs and preparing them to progress by finding out how the students learn, react, and perform when using movement in clinical practice. By adapting to students' needs and preparing students to progress in their use of movement in these ways, instructors establish a learning environment that supports the unique needs of their students.

Finding 2. Instructors Must be Intentional when Teaching Students To Use Movement

Once clinical instructors establish a learning environment supportive of the unique needs of their students, instructors could effectively facilitate students' development of movement use in practice. However, in order to do this, instructors needed to be intentional when teaching students to use movement. This intentionality was demonstrated as they used a variety of carefully selected teaching strategies to *enhance* student learning. Then, instructors further facilitated students to *connect* key concepts of movement use to patient outcomes.

The student had been looking forward to the upcoming treatment session. The instructor had described, in great detail, the patient's medical background, her struggles to recover from a devastating injury that had left her unable to use her right leg, thereby restricting her to use crutches to walk. Today, the instructor and student would be assisting her to walk without crutches for the first time since the injury. The instructor and student together had carefully planned the treatment session. Though the student had not yet worked with this patient, she had helped other patients walk without the use of an assistive device many times. As the student began to help the patient walk for the first time, the patient struggled to progress her foot forward. Though the patient had sufficient strength and joint flexibility, she could not move her leg as the student expected. The instructor stepped in, placed one hand on the patient's pelvis and the other around her abdomen. Simultaneously the patient began to walk as the instructor provided support and cues through his hands. The student, impressed with the instructor's success, asked him what his hands had done. The instructor, who had done this same thing with countless patients, found himself unable to clearly articulate his actions.

As demonstrated in this vignette and observed often during the study, a prerequisite for intentionality in teaching movement is the instructors' ability to articulate their own movement to their students. The clinical instructors in this study recognized their responsibility to guide students through learning vital aspects of clinical practice during the internship period. Likewise, they each articulated the inherent challenges faced when

teaching students as they transitioned from learning in the classroom to learning in the clinic. Previously conceived ideas about how their use of movement translated to their students were less consistent among the instructor participants. While some participants were able to clearly articulate how they conceptualized their own movement and how they used that concept to facilitate movement related skills in their students, other instructors were less clear, both in interviews and practice, about how their experience in using movement could be easily used to teach their student. Though all instructors demonstrated very effective movement use in practice, and each of their students recognized his or her instructor's high skill level, there was a range of instructor ability to conceive and translate that skill through their teaching.

It has been recognized that expert physical therapists pose a unique use of movement and that this use of movement is often unconscious, or tacit (Jensen et al., 2007). The concept of tacit knowledge was first described by Micheal Polanyi (1958), a physician, in response to his own awareness that his attention could be focused externally on a procedure or patient while automatic processing of high-level skill was occurring without conscious thought. Tacit knowledge has been recognized in the health professions literature as an important aspect of developing one's professional epistemology and an aspect of professional knowledge that often is left unexpressed verbally (Henry, 2006; Jha, 1998; Sturmberg & Martin, 2008). The ability of a clinical teacher to articulate tacit knowledge "is one of the most significant skills of the good clinical teacher, and one that should be part of clinical

teacher training programs. This unpacking has to be performed in a way that can be understood by the student, not just by the teacher” (Fugill, 2012, p. 3).

Clinical Instructors Use a Variety of Teaching Strategies to Enhance Student Learning

The instructor’s use of tacit knowledge became even more important as he or she provided learning opportunities within the context of the individual clinical settings. Instructors all realized that students were unable to sufficiently integrate movement into practice simply by watching and trying to mimic instructor action. This method would not reveal the instructor’s tacit knowledge to the student. Instructors in this study enhanced learning when they were able to intentionally express their tacit movement knowledge to their students. This occurred as they chose from a variety of teaching strategies meant to express tacit knowledge. Two frequently used methods unanimously cited as effective by students were learning through hand-over-hand treatment sessions and by learning from colleagues in the clinic.

Enhancing student learning by placing hand-over-hand. Students, especially early in the process, felt they needed to be grounded in how to use their hands.

The student and instructor were both kneeling behind the two-year-old boy, as he busily played with a pretend kitchen. Though he was only concerned with preparing his imaginary meal, the instructor and student were intent on correcting his pelvic position and strengthening his abdominal muscles to promote improved stability in his trunk. The instructor asked the student to place her hands on either side of the boy’s hips. As she did, he placed his hands directly on top of hers. Using his index fingers he moved the student’s index fingers up higher on the child’s abdomen. Then he placed each of his fingers directly on top of hers and began to adjust the child’s pelvic positioning through the student’s hands. Once the instructor and student had their hands positioned in the proper place for the child’s pelvic positioning, the instructor began to press slightly inward on the boy’s stomach with a small downward motion towards the floor. As their hands moved in concert, the

student could feel the boy's trunk become more solid beneath her fingers, and she watched as he stood taller and busied himself with the final preparations of his meal.

When clinical instructors placed their hands over their students' hands, students were able to feel what had previously only been observed or heard from the instructor. This provided an additional method of learning for the student and built confidence in their own ability to perform a close representation of the movement they observed their instructor performing. Placing instructor hands over the students' hands was especially helpful early in the learning process as the students were eager to mimic the instructor and perform movements exactly as their instructor did. This teaching strategy also provided a foundational context for how the student may begin to move his or her own body early in the learning process or at times of high frustration or confusion. Rose (1999) describes the use of the instructor's hands to alter and correct the student's use of movement in a physical therapist classroom environment as a beneficial teaching tool for students learning manual skills. Just as in this study, Rose (1999) indicates that the use of hand-over-hand teaching is one of many teaching strategies that must be used in combination to help students integrate movement into their practice. Despite this very commonly used strategy for teaching movement use in the clinic, there is very little literature to support its effectiveness. Students in the study all agreed that it was one of the most impactful ways to learn to use movement when treating their patients.

Enhancing student learning by collaborating with colleagues. Instructors relied on their colleagues to help convey tacit knowledge and enhance the learning process for students. Instructors intentionally orchestrated these experiences to allow the students to experience the variability of movement use and to enhance the student's repertoire of

movement related skills. Each student participant echoed the benefits of these opportunities and appreciated the benefits of learning within a community. The benefits of applying practical knowledge and gaining skill in a setting rich with collaboration and communication have been well documented in the literature (Li et al., 2009; Schön, 1987; Waters, 2004; Wenger, 2006; Wenger, 1999). Often termed “communities of practice”(Wenger, 1999), these groups provide an opportunity for novice learners to gain insight from more skilled and knowledgeable colleagues while being immersed in an environment rich with opportunity to learn, experiment, and grow professionally.

Clinical education in physical therapist training provides a formalized community of practice for students and their instructors. Students learn what it means to practice and use skills in a professional context all while getting formalized and informal feedback about their ‘fit’ within the profession. This feedback may be either implicit or explicit but shapes the learners ability to integrate new skills and knowledge in practice. The community of practice also allows the novice to discover and discuss the tacit nature of the profession that otherwise may go unnoticed to its members (Egan & Jaye, 2009). In clinical learning “social participation is the basis for learning...[It is] a powerful framework for recognizing and explaining paradox and incongruence in clinical teaching, and also for recognizing opportunities, and devising means, to add value to students’ learning experiences (Egan & Jaye, 2009, p. 107).

Despite common agreement among instructors and students about the benefits of experiences with other clinical colleagues leading to purposeful expression of tacit

knowledge, many of the instructors missed opportunities to fully explore the benefits of the student's time with clinical colleagues. Though instructors relied on a community of practice, they often did not spend time in discussion with their students and colleagues about the variability experienced in movement use and comparing and contrasting the differences the students found between clinicians. It was mostly left to students to independently draw out the tacit nature of movement use observed in other colleagues and analyze the variability seen throughout his or her internship. Instructors also varied in their ability to express their tacit knowledge to their students. Some students felt that they were only able to gain understanding of their instructor's movement use by observation and feeling because the instructor was unable to effectively communicate what they were doing.

Both of these concerns are likely a result of the degree of instructor's self-awareness of their tacit knowledge in movement. The busy life of a fulltime clinician and clinical instructor allows little time for exploration of one's own tacit knowledge. However, critical reflection allows the teacher to enhance his or her own abilities as well as promote growth in their students (Brookfield, 1995, 1998). Through more reflection in practice and self-awareness of their own movement use and skill, clinical instructors may be able to further enhance the clinical learning situation for students integrating movement in their practices (Kinchin, Cabot, & Hay, 2008). Likewise, by acknowledging and expressing their own tacit knowledge instructors can better promote enhanced learning when they elect for their students to spend time with other clinical colleagues. Instructors should encourage their students to engage in conversation with colleagues about their tacit movement use decisions.

Subsequently, instructors should facilitate conversation with students about their decision making process and how it may differ from the colleagues students spend time with during these intentional learning opportunities.

Clinical Instructors Facilitate the Student to Connect Concepts of Movement Use to Patient Outcomes

As clinical instructors enhanced students' ability to use movement through carefully chosen teaching strategies, it became vital that the instructors help their students connect the skills they were learning with the intended outcomes for their patients. Learning to use movement was not sufficient alone. Students had to be able to appropriately choose and deliver a movement strategy that met a need for the patient's recovery. Furthermore, students had to understand how their own movement promoted recovery in the patient and foresee the benefits to the patient beyond the current treatment session. It became the clinical instructor's role to provide learning activities that furthered the student's knowledge beyond movement skill delivery to understanding the implications of his or her movement use. Once again, instructors used a variety of strategies to accomplish this goal. Some asked students to explore relevant rehabilitation literature for discussions about its implications for movement use in patient care. Others required students to present a case study presentation to staff with a collaborative discussion about the students' treatment decisions and their effects on the patient and the patient's prognosis. Three common strategies intentionally selected by instructors to help students connect their movement actions with patient outcomes were reflective discussion, independent learning, and engaging and teaching the patient.

Connecting through reflective discussion. One strategy all clinical instructor participants in this study used to promote the student building connections in their movement use was simply through reflective discussion.

The student and instructor walked back to the office after they finished treating a lady in the therapy gym. As they walked, the instructor began to ask the student questions about what she had done with the patient. “How did your hand placement on her back help her to walk?” “Where could you have offered more assistance with your hands to improve her confidence?” “What effects will that have on her ability to do this independently when she goes home?” “What will you do differently next time we treat her?” Each question was followed in turn by the student’s thoughtful answer.

From the beginning, clinical instructors provided useful wisdom to their students about the intended outcomes of their choices in movement use and the resultant prognosis for patient improvement. As students’ skill increased, instructors engaged their students in deeper conversations about the accuracy of the students’ movement use, the implications of its use on the patients’ function and, long-term considerations of the patients’ well being. Confident and self-reflective students were able to take these discussions and integrate them into their future decisions regarding movement use in practice. As mentioned above, early in-depth discussions with students had a tendency to overwhelm them. Once the student had a basic context for movement use, discussing its ramifications in patient care was more beneficial to the learning process.

Mann et al. (2009) performed a systematic review of the health professions educational literature to better understand how reflection is used in practice and its effects on the practitioner and student learner. Their review found that “reflection appears to include an anticipatory phase, where past experience informs planning; it is encouraged by appropriate

supervision; it appears to occur most often in novel or challenging situations, where the professional's knowledge-in-action is not adequate to the situation" (Mann et al., 2009, p. 601-602). The authors explained that reflection is developed most through an environment that intellectually and emotionally provides context and accommodates for differences in learning style, mentoring, and free expression of ideas. These findings corroborate the experiences of this study's participants who required a collaborative and supportive environment and instructors' willingness to accommodate changing or developing learning styles to build connections by reflecting deeply about movement use in practice.

Connecting through learning independently. Students also acknowledged that they readily made connections between their own movement decisions and their patients' outcomes when instructors allowed for independent learning with the patient.

The student and the patient stood in the parallel bars together on one side of the therapy gym. The instructor was across the room working on the computer. As the student worked with the patient to improve her balance, she positioned her body very close to his, remained rigid through her trunk and placed her legs wide apart to maximize the support she could offer in case the patient began to fall. As the student continued to work with the patient, the instructor frequently glanced up from his computer to check their progress. The patient met each of the student's challenges with only minor wobbles in his stance. While the patient rested, the student constructed a make-shift obstacle course using items from the clinic. Her course extended beyond the parallel bars into the center of the gym. As the student began to assist the patient through her course, the instructor walked over and stood close to the patient and student.

As described in this vignette, students appreciated regular opportunities in exploration, using their hands and body to help the patient with little input from the instructor.

Through this period of trial-and-error, students were able to reason, adjust, and adapt their movement skills using only the feedback of the patient's response to their actions.

Instructors added intentionality to these periods of free exploration of movement use by intermittent feedback when the instructor sensed frustration. Students also agreed that though they enjoyed the ability to explore using movement independently, they did not want this utilized as a sole teaching strategy. Students also depended on knowing their instructor was readily available to answer questions and provide feedback whenever the student was trying to use movement independently. Confident later learners who had gained context for movement use through observation, feedback, and hand-over-hand guidance most commonly appreciated time to learn independently.

Allowing students to explore movement use by practicing independently with a patient moves the role of the clinical instructor from ‘teacher of information’ to ‘facilitator of learning’. This paradigm shift may be difficult for clinical instructors who are eager to express their knowledge and technique directly versus help the student enhance their knowledge and skill through discovery. A 2005 review by Lambert and Glacken investigated the nursing literature and found there was little consistency in how clinical instructors perceived their role to be facilitators. Likewise, there was a paucity of training initiatives for instructors to learn how to facilitate learning by acting as a mentor instead of an instructor.

Connecting through engaging and teaching the patient. Instructors also assisted students in connecting their use of movement with their patients’ needs through patient education. “See one, do one, teach one” is a long-standing adage for the training of learners in health professions (Tuthill, 2008, p. 1906). Some have described this as healthcare’s signature training pedagogy (Coughlin, McElroy, & Patrick, 2009). This philosophy of

clinical training, pervasive in the health professions, recognizes the benefits to the learner of watching, practicing, then teaching others as a mechanism for ensuring understanding of complex clinical skills.

The patient sat on a large mat in the center of the clinic. His wife had told the student she needed to be able to move him from the bed to his wheelchair each morning. The student positioned herself in front of the patient and began to describe the placement of her hand, positioning of her trunk, and movement of her legs as she assisted the man to stand, pivot, and sit in the wheelchair. Next, she did the same thing with the patient's wife, again describing her actions as she positioned and moved her body. The student and instructor now watched as the wife attempted unsuccessfully to move her husband. The instructor now approached the wife and performed the movement on her, with a detailed verbal description. "Do you feel the difference," he asked. She nodded. "Would you please describe what felt different to the student?" he politely requested.

As described in the vignette, in this study instructors often asked students to describe their treatment decisions to the patient, his or her family members, or parents. This required students to articulate an understanding of what their hands and bodies were doing, explain it to individuals who had no prior understanding of using movement in a therapeutic manner, and describe why this choice of movement was beneficial for the patient. Students cited this teaching strategy as one of the most effective mechanisms for allowing them to understand their movement use and its implications for the patient. If students were unable to describe their movement decisions in layman's terms, then they had to reflect on why and further engage with their instructor to better understand how their movement use was impacting the patient.

Just as in the vignette above, sometimes instructors would invite the patient or family member to be a part of the teaching. Despite the participants' unanimous agreement that the

patient is an invaluable aspect of the learning environment, scarce attention was paid by the instructors or students to fully utilize the patient in the learning situation. All participants appropriately informed the patient that a student learner was involved in their treatment, and most patients eagerly agreed to have their care partially provided by a learner. On rare occasions, however, did the instructor or student capitalize on the patient's eagerness to assist the student. The instructor and student generally viewed the patient, solely, as a willing recipient of student treatment.

Additionally, there were times when the instructor utilized the patient as a passive instructor, taking information the patient had relayed about the impact of treatment on daily activities as a method to help the student modify his or her actions. Only once however, during the study did an instructor actively engage the patient in providing feedback and instruction to the student about his or her use of movement. By asking the patient to compare and contrast the influence of the instructor's movement with the student's movement, the student received valuable information about the patient's perceptions related to the influence of the movement used. Here the instructor demonstrated intentionality by involving the patient as an equal partner in the learning situation, prodding the patient to provide rich and substantive feedback, and asking the student to immediately integrate the patient's feedback and receive more. More often than the instructors, students would ask patients questions like "How does that feel?", "Am I hurting you?", or "Is this helping?" This attempt to elicit feedback was, however, cursory and seemed to serve little educational purpose as the student almost always carried on with minimal noticeable change despite the patient's response. It

may be more helpful for the experienced clinician to instruct the student on appropriate ways to request feedback that is constructive for altering one's movement use.

The intentional integration of the patient teaching the student is consistent with the physical therapist's professional values for caring/compassion, patient centered care, and ethical practice (APTA, 2012; Jensen et al., 2007; Swisher & Hiller, 2010). Little can be found in the literature about the effect of patient feedback on student development in clinical education. However, it stands to reason that encouraging and facilitating patients to be an engaged part of the learning process only helps the student make important connections between his or her movement use and the patient's outcomes.

Discussion of Finding Two

This study clearly demonstrated that students' movement use is best facilitated when instructors use intentionality in their teaching. A key to this intentional teaching is the instructor's ability to convey his or her tacit knowledge about movement use to students, thereby allowing students to move beyond the benefits of simply observing and mimicking the instructor to more fully understanding the instructor's decision making process when using movement.

As instructors convey their tacit knowledge of movement, they are further able to enhance student learning through a variety of intentionally selected teaching strategies. Strategies like placing their own hands over the student's hands allow the student to hear and feel the tacit knowledge of the instructor at the moment in time that movement must be imparted on the patient. Student's movement use was also enhanced when instructors elected

to send the students to learn with other colleagues, allowing them to explore the tacit knowledge of others and compare and contrast it to their own.

Instructors further demonstrated their intentionality in teaching movement use as they helped the student make connections between his or her movements and the patient's outcomes. By leading students in reflective discussions about their movement, allowing students opportunities to explore movement use independently, and by engaging patients in the teaching process and having students teach the patient, students were able to make important connections, further solidifying the complexity of movement use.

The instructors' abilities to help students connect their movement use with the intended purpose and outcome for their patient's recovery marks a further shift in the instructor's role from 'teacher' to 'mentor' as they assisted the students to deeper conceptual constructs in their clinical reasoning, decision making, and movement use. Through discussion, reflection, and patient education, the instructors were able to help their student make important connections that built a foundation for ongoing professional development along a pathway towards an embodied use of movement in practice.

Finding 3. Instructors Play a Vital Role in Establishing a Foundation for Students'

Trajectory of Movement-Related Professional Growth

The ultimate role of the physical therapist clinical instructor was to initiate a process of lifelong learning and professional development for the student, which included an integrated sense of movement use. Clinical instructor participants each felt a sense of obligation to help students discover how their use of movement may impact their future career interests. By the

end of the internship, each instructor had a sense of what his or her student's practice interests were, and each instructor offered insight to the student about how the skills he or she had gained during the internship may further be developed beyond the internship and into his or her first years of practice.

Developing Growth by Promoting a Student's Unique Philosophy of Movement

As students progressed in their use of movement during the internship period students and instructors alike began to notice differences between when students mimicked their instructor's movement and when students were able to freely develop their own unique sense of movement use. Early students relied on attempts to copy the movement patterns they observed or felt from their instructors. As students progressed in their skill and understanding, some were noted to use movement in ways that were different than their instructor. As long as the movement was effective and met the patient's needs appropriately, this was usually met with enthusiasm from instructors.

The instructor and student were seated on the floor on either side of the eight-year-old girl. Her legs, too weak to remain straight when she stands, were the focus of their sharp attention. For weeks, they had been trying to get her to extend her knees and push her body upward to simulate what her legs needed to do to stand. Nothing had been successful. "Do you have any more ideas?" the instructor said quietly to the student. "Last night I was thinking about something. Can I try?" The student rushed around the clinic gathering bolsters and foam wedges. She stacked the items making a small ramp perfectly sized for the child's back and neck. She assisted the girl to lie down. Placing her hands strategically on the child's legs she asked the girl to move her feet to a target she had placed on the wall. Next, with one hand on the child's knees, and another hand behind her hips, the student said, "Now push that target as hard as you can!" As the little girl began to push, the student deftly assisted her muscles behind her hips and above her knees with her hands. Slowly the child pushed herself up the small ramp smiling. The instructor, seated close by, looked at the student and said, "Brilliant."

As demonstrated in the vignette, most instructors realized that students' ability to problem-solve and use movement without instruction was a sign of students' development in their use of movement and their ability to enter independent practice with a skill set that would serve them independent of their instructor. Some instructors referred to this as "developing a style [of movement]" or a "philosophy of practice [or movement]". This description of students' independent movement use was the same description instructors used to recognize positive differences in movement use seen amongst their colleagues.

Occasionally, however, when students displayed an independent style of movement use, instructors voiced concern. Even if they agreed that the student was effective in his or her treatment of the patient and the student's choice of movement garnered a positive outcome, some instructors seemed uncomfortable with their student's apparent departure from their own movement style. It was unclear why some voiced trepidation when students evolved their own use of movement. It may have been because they were uncertain when or how this developed. It could have caused the instructor to reflect on their abilities as a teacher and wonder if the student learned better from a colleague with which the student had spent considerable time. Whatever the case, instructors' demonstration of concern about students' independent development of movement use was rare.

The ability to develop an individual sense of movement use was a quality only displayed in late, mature learners whose clinical instructors had been very adept at adapting to their needs as learners, enhancing their learning through carefully chosen and intentional teaching strategies, and who assisted the student to make deep connections between their

actions and patient outcomes. In Dreyfus and Dreyfus's (1986) five-stage model of skill acquisition, novices progress to experts by developing their skill and honing an ability to independently understand the abstract nature of their practice, make decisions based on context, and draw on previous experiences. Though it is outside of the scope of this study to identify student participants' stages of development, it could be argued that those students who demonstrated effective movement in practice utilizing a unique style of movement have progressed well beyond the novice stage described by Dreyfus and Dreyfus (1986). When students were asked to describe their own movement style, most simply indicated that it was "developing". This demonstrated a clear self-reflection that they had progressed in their use of movement but still had a long journey ahead to be able to demonstrate the effective movement skills they observed in their instructor and other clinical colleagues. Some students were further able to recognize that their use of movement had become more automatic, requiring less intentional thought before each and every placement of a hand or positioning of the body. Again, students commented that they each anticipated significant development ahead in order to demonstrate movement skill on the level of their instructors.

Discussion of Finding Three

This study demonstrates that movement use is further facilitated as instructors help establish a foundation for students' trajectory of movement-related professional growth. As students in this study began to develop their own independent use of movement, they may have been initiating a process that leads towards embodiment. Dall'alba (2009a, 2009b) suggests that professionals have some skill, mindset, or philosophy that is an embodied part

of their nature as a professional. Jensen et al. (2007) recognized that movement use is a unique attribute of physical therapist experts that appears automatic. To date, there is little literature available that examines how professionals develop this automatic or embodied sense of movement use. What seems evident in this study is that the clinical instructor plays a role in initiating a process that allows the student to explore movement use and find an individualized way to integrate it into his or her practice. Again, impossible to state conclusively from this research study, but the students' feelings that their movement use was becoming more natural, automatic, and a part of their ability to practice independently may be a sign that the students, clinical instructors, and patients had together effectively initiated a process of professional development that may one day lead to a fully embodied use of movement in practice.

Summary of Findings

This situational analysis examining how physical therapist clinical instructors perceive and facilitate students' use of movement in practice revealed three important findings. First, instructors must establish a learning environment supportive of students' unique needs as learners. By perceiving their individual needs, instructors are better able to facilitate their learning as the internship progresses. Next this study found that instructors must be intentional when teaching students to use movement in clinical practice. Intentionality in teaching is best expressed when the instructor is able to express his or her tacit knowledge of movement use. Finally, this study found that instructors play a vital role

in establishing a foundation for students' trajectory of movement-related professional growth.

Through the situational analysis mapping strategies used in this study, consistent themes across these key findings became clear. After careful study of the situational, positional, and social worlds / arenas maps, I created a project map to depict how instructors assisted their students' movement use in practice. Project maps are the end result of the situational analysis process and analytic process engaged in a situational analysis. A project map is intended to depict the overall lessons learned from the previous mapping strategies and convey the overall message of the project's findings (Clarke, 2005). This study's project map (see Figure 5.1) depicts the thematic categories in the process utilized by instructors working with their students.

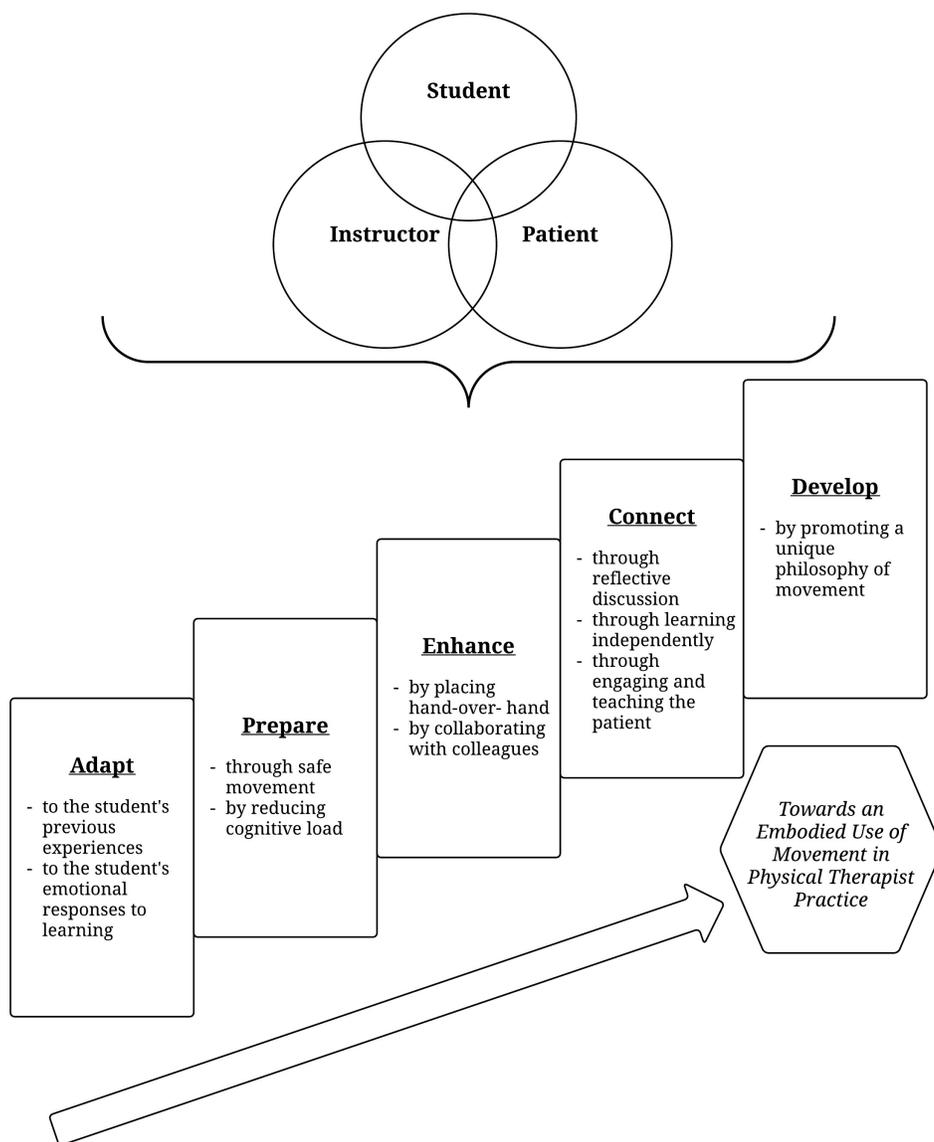


Figure 5.1. Project map depicting the learning relationship between the student, instructor, and patient, and how through this relationship the instructor develops his or her students' use of movement in physical therapist practice.

The two themes *adapt* and *prepare* help describe ways in which instructors perceived the needs of their students, as they established learning environments supportive of the unique needs of their students. The next two themes, *enhance* and *connect*, signify methods for facilitating the students' development as they learn to use movement in their practice. The final theme, *develop*, demonstrates the final way in which clinical instructors help facilitate students' movement use as students begin to emerge with their own unique philosophy of movement use. The teaching and learning relationship that exists between instructors, students, and patients influence these five themes. Each of these individuals influences the other as the student progresses towards an embodied use of movement in practice.

Instructors and students built a relationship of trust and communication that formed the foundation of the students' future development and allowed them to perceive their students' needs. Once this foundation was in place, instructors adapted their teaching strategies to incorporate students' previous experiences. As students began to grapple with the complex and ambiguous nature of learning to use movement, they often displayed emotional responses to the stress, frustration, and feelings of being overwhelmed. Instructors helped students by adapting to these emotional responses and guiding them through understanding how to learn to use movement in clinical practice.

As instructors adapted to the needs of their students, they quickly began to prepare them for the complexity of movement use that the student would face throughout the internship. First and foremost, instructors helped students understand how to use movement safely in the context of their patient caseloads. They also struggled to manage the cognitive

load the student faced initially as the instructors sought to teach large amounts of information. Instructors who were able to pace this load may have better promoted students to integrate movement use into practice later in the internship.

Once instructors were able to perceive their students' needs, they found ways to facilitate their development. Instructors found a variety of teaching strategies useful to enhance student learning through the expression of their tacit knowledge of movement use. Frequently this involved placing their own hands onto the students' hands or body to help them feel the desired movement as they simultaneously treated patients. Another commonly used intentional strategy was to allow students to spend time learning with other colleagues in the clinic. This enabled students to experience the tacit movement knowledge of other therapists and contrast that with that of their instructor.

Instructors helped students make connections between the movement of their bodies and their intended outcomes with patients. Through reflective conversations and pushing students to describe their actions and clinical reasoning, the instructors allowed the students to build a deeper understanding of why they used movement in practice. Instructors allowed students to engage in self-discovery as they worked with patients free from constant input and realized the influence of their own hands, thereby deepening students' ability to make connections between their actions and their patients' outcomes. Also, instructors facilitated connections by engaging the patient in the process of teaching and learning and encouraging their students to articulate their movement knowledge by teaching patients.

Finally instructors were instrumental in allowing students the freedom to begin to develop their own unique movement philosophy and style of movement use with patients. By allowing their students the freedom to become a movement use professional they helped initiate a trajectory of professional development that may one day result in a fully embodied use of movement in expert physical therapist practice.

Though the themes have been presented in series and are depicted as such in the figure, there may be times when the instructors moved between the themes as they worked with students. For example, as instructors helped students make connections they may have needed to further adapt to the students' needs as learners in the face of new challenges. As instructors created a foundation for the development of students' unique movement philosophy, they may have found the need to further their preparation of the challenges to come in the students' development. As these examples demonstrate, it is important for the instructor to use all the strategies at his or her disposal as he or she perceives and facilitates the student's development of movement use by adapting to the student's needs, preparing for future learning, enhancing learning experiences through carefully selected teaching strategies, connecting student's use of movement to patient outcomes, and developing the student's unique movement philosophy.

CHAPTER 6

IMPLICATIONS FOR RESEARCH AND PRACTICE

Physical therapist clinical instructors help students learn to use the movement of their hands and body to improve patients' functional movement. This study examined the research question: How do physical therapist clinical instructors perceive and subsequently facilitate students' development of the use of movement during clinical practice?

The findings from this study offer important new insights about the type of environment and learning process necessary for clinical students to integrate movement use into their practice. Three findings, supported by five themes emerged as data analysis took place. First, the study demonstrated that physical therapist clinical instructors must establish a learning environment supportive of students' unique needs in order to help them integrate movement into practice. This is facilitated through two themes, adapting to students' reactions to learning, and preparing the student for the complexity of movement use. The second finding demonstrated that instructors must be intentional when teaching students to use movement. This is supported by the themes of enhancing student learning through teaching strategies and connecting student action to patient outcomes. Finally, instructors play a vital role in establishing a foundation for students' trajectory of movement-related professional growth. This is demonstrated by the theme of developing growth by promoting a students' unique philosophy of movement.

The three findings each have significant implications for future professional practice and research. Because this study is the first of its kind to examine how clinical instructors

assist students to integrate movement into practice, the findings will potentially shape future research agendas in the profession. The five supporting themes, *adapt, prepare, enhance, connect, and develop*, likewise have practical application for the ways clinical instructors may conceptualize their role in teaching students in the clinic. Implications for research and practice will be discussed within the context of these findings and themes.

Implications for Research

This unique study is the first of its kind to describe how instructors, students, and patients work together in learning to use movement and progress students through a process that potentially directs them towards an embodied use of movement later in practice. Though previous research indicates that physical therapist experts have a unique use of movement in practice (Jensen et al., 2007), no research exists that demonstrates how this expert use of movement actually becomes an integrated and embodied aspect of physical therapist practice. The findings from this study offer insight into the early process as students begin to learn about the complexity and ambiguity of movement use and integrate it into their emerging practices. Since we are just beginning to discover how physical therapists integrate movement into their professional being, much more research is needed to better understand this aspect of professional formation.

Finding 1. Establishing a Supportive Environment

This study demonstrated that a supportive environment is necessary for students to effectively integrate movement use into their practice. This supportive environment is created through a close working relationship between the instructor and the student and

centers on a trust-filled relationship that allows students to explore the use of movement and seek necessary feedback from their instructors. As discussed in chapter five instructors used a variety of techniques to create an environment supportive of students' learning to use movement. One way they accomplished this was through adapting to students' previous experience as a way to support their needs as learners. Instructors clearly agreed that previous movement-related experience was highly beneficial for students learning to use movement. There is ample literature about the importance of adult learners building on past experiences when learning (Knowles, Swanson, & Holton, 2011). However, little is known in physical therapy education about which specific previous experiences have the most effect on learners. Further research should be conducted which reviews students' experiences prior to physical therapy school and associates these experiences with performance in clinical education. With a greater understanding of how previous movement-related or other experiences aid students learning in the clinic, professional programs may better counsel and prepare students to learn to use movement.

Finding 2. Teaching with Intentionality

This study revealed the importance of clinical instructors' ability to express their tacit knowledge and choose teaching strategies to help students understand this knowledge as it relates to movement use. An interventional study that compares a group of instructors educated on tacit knowledge reflection and expression versus a group without professional development intervention would provide further information about how to best help instructors express their tacit knowledge of movement use to their students.

This study described the variety of intentionally selected teaching strategies commonly employed by physical therapist clinical instructors facilitating students to learn to use movement in practice. It was, however, outside of the scope of this study to determine which methods have the most impact on students' integration and potential embodiment of movement use. For example, in this study several student participants discussed the importance of where they directed their attention when watching their instructor work with patients. Some students valued being directed to watch their instructors' hands. While other students appreciated direction to watch patients' responses to therapists' movement use. What remains unknown is if the instructors' intentional decision to direct their students' attention makes a difference in movement use integration in practice. Follow-up qualitative studies should focus on specific ways, like the one just described, in which instructors choose to direct their students' learning and the effects this direction may have on movement use integration.

Though this study established the importance of intentionality in teaching movement use, instructors only demonstrated intentionality through their selected teaching methods and verbal instruction or feedback. Clinical instructors in this study did not provide any written formative or summative feedback directly about the students' use of movement. Data collection in this study included document analysis of the Clinical Performance Instrument (Roach et al., 2012). This lengthy summative evaluation of the student's clinical performance includes 18 performance dimensions for the clinical instructor to assess. Additionally the student self-reflects on each of the 18 dimensions. None of these

dimensions overtly recognize the importance of movement use in practice. Recommended future research should include a mixed methods study of the influence of an overt written assessment of students' movement use and its influence on students' performance and instructors' intentionality in the clinical internship.

This study revealed the importance of intentionally engaging the patient in the learning situation as students begin to integrate movement in practice. However, the study protocol did not include interviews or other patient-specific data collection of any kind. The current literature does not address the understanding of the role that patients play in students' movement use learning and how clinical instructors and students might best engage the patients to be an active participant in the learning situation. Therefore, a follow-up qualitative or survey-based study that examines patients' perspectives about their role in clinical teaching situations and how students to learn to use movement may prove helpful.

Finding 3. Establishing a Foundation for Development

This study recognized the important role physical therapist clinical instructors play as they help the student establish a foundation for future professional development related to movement use in practice. Further research is needed to examine the role for instructors in establishing a trajectory of professional development at other stages of learning for physical therapist students and professionals. Though this study included students in their second and third years of training, there is a great deal of variability in clinical internship placements in physical therapist professional programs, with many students entering clinical education as early as their first semester of didactic coursework (CAPTE, 2011a). Additionally, early

clinical internships may be shorter in duration than those studied herein. This study's methodology could be repeated to demonstrate differences in how clinical instructors work to help students develop movement use during internships that are earlier or shorter in duration as compared to the findings of this study.

As discussed, Jensen et al. (2007) described in great detail the attributes of physical therapist experts, which include a unique use of movement in practice. This study extends those findings and describes how this process may begin as clinical instructors demonstrate an embodied sense of movement use to their students and facilitate its development within their students' practice. As we begin to understand more about how this process is initiated, it is important to study how professionals continue to integrate movement use as an embodied aspect of practice along trajectories towards expertise. The ambiguity faced during this process influences professionals to engage in various trajectories towards full embodiment of their professional attributes (Dall'Alba, 2009a, 2009b). Dall'Alba's model of professional development proved a useful framework for studying movement use acquisition in physical therapist students. As discussed in chapter four, the students and instructors demonstrated aspects of each of the ambiguities Dall'Alba describes as present in the development of professionals towards embodiment. Very few studies (Larsson et al., 2012; Petty et al., 2011a, 2011b) have referenced Dall'Alba's (2009a, 2009b) professional ways of being as a way to conceptualize movement use development in physical therapists. None of these studies used this model to consider how instructors facilitate students' use of movement. The student participants in this study faced the ambiguity inherent in learning to use movement

and began to be able to articulate how this ambiguity influenced their emerging practice. Therefore this study lends credence that Dall'Alba's model is a useful tool in further analysis of how physical therapists face ambiguity as they embody movement use throughout their profession.

As the focus of this model (Dall'Alba, 2009a, 2009b) is on the ambiguity faced as professionals move toward an embodied level of expert practice, this study has only begun to understand how students, and later licensed professionals, continue to develop their use of movement as they move towards an expert level of practice. Along a trajectory towards expertise, students or new professionals may engage in a variety of possible pathways as they become independent practicing therapists. A longitudinal study of this process may reveal further findings about how their use of movement continues to progress and become an embodied part of their practice. Such a longitudinal study may also shed light on why some physical therapists do not reach an expert level of movement use. Understanding how a professional's use of movement is impacted throughout his or her career will help the physical therapy profession make better decisions related to didactic and clinical education methodology. Additionally, such studies may help the profession better support its members as they develop professionally throughout their careers.

Finally, this study revealed five themes important as instructors perceive and facilitate students' development of movement use in practice. The profession would benefit from a tool that can be used to collect objective information about how clinical instructors help students develop use of movement in practice across these five themes. A research study

focused on the creation and validation of such a survey tool would enable further study of this important phenomenon leading to the collection of quantitative data that would inform the body of literature on this topic.

Summary of Implications for Research

Though the findings in the study were consistent among the five pairs of instructors and students, the small sample needs to be expanded in order to better understand broader regional or national practices of instructors and students. Further research is needed to determine if and how the findings from this study extend to larger sample sizes and variations in clinical internship practice settings. This study included variety in practice settings, including ambulatory pediatrics, acute care pediatrics, ambulatory neurology, and inpatient rehabilitation. However, there are many other practice environments in which physical therapists work and students learn. Research should be extended to practice settings with more orthopedic focused clinicians, which represent a large portion of the profession's practice. In addition to orthopedics, many other physical therapy specialty practices were not represented in this study's sample. Additionally, adult acute care practice and skilled and long-term care practice settings were not represented in this study. Therapists in each of these specialties and practice settings may have nuanced ways of teaching students to learn to use movement. It is important for research to examine if the findings and themes described by this study extend to these other areas of practice. Studies that repeat this study's methodology in other practice settings will demonstrate if an emphasis in a supportive environment is consistent across practice settings. Repeated studies in various settings will

also demonstrate if instructors adapt to and prepare students in consistent ways across the profession. In summary, suggestions for further research to extend our knowledge of how movement use is integrated into the practice of physical therapists as they develop professionally include:

- A retrospective study of students' previous experiences and their influence on movement-related performance in clinical education.
- An interventional study examining the effects of teaching instructors how to reflect and express their tacit knowledge about movement use.
- A study of the effects of instructors' selected teaching strategies for movement and their impact on student learning.
- A mixed methods study examining the influence of formalized written assessment of students' movement use.
- A qualitative survey of patient perceptions about their role in teaching students how to use movement in practice.
- Longitudinal exploration of how physical therapists progress along various pathways of movement use expertise.
- Creation and validation of a survey tool that examines the ways in which instructors perceive and facilitate movement use in their students.
- Repeating this study's methods in other practice settings.
- Repeating this study's methods in other practice specialties.
- Repeating this study's methods in earlier or later clinical internships.

- Repeating this study's methods with internships of various durations.

By engaging in these potential study areas, the profession of physical therapy and its clinical and didactic educators will be better positioned to develop expert practitioners who embody a use of movement in their practice.

Implications for Practice

In addition to the important implications this study has for future research in physical therapy education, the findings of the study also have practical implications for physical therapist education. The five themes revealed in this study (adapt, prepare, connect, enhance, and develop) provide an excellent framework for academicians and clinical instructors as they consider ways they can best assist physical therapist students to integrate movement use in their practice. Practical implications for each of the five themes are discussed below.

Adapt

This study found that instructors must effectively respond to their students' unique needs as learners in order to maximize their ability to integrate movement use in practice. This most often manifested in a need to examine the students preferred learning style and determine its efficacy for learning to use movement. Clinical instructors should be cognizant of this role and ready to help students negotiate a potentially emotional and stressful transition as they refine or adapt their learning styles for learning movement use in practice (Henderson, Winch, and Heel, 2006).

The study findings also indicated the importance of the students' previous experiences when learning to use movement. Clinical instructors agreed that students with

prior experience in athletics, dance, or other movement related activities understood their own bodies in ways that facilitated learning to use movement in practice. Though the profession should not exclude admission to only those with prior intensive experience in movement, there may be ways that training programs can enhance students' understanding of their body's movements. Course work currently exists internationally to help physical therapists teach their patients better body awareness, with the goal of increasing the patient's ability to progress in their rehabilitation (Skjaerven et al., 2007; 2010). Similar strategies may be optimal for ensuring students learn to understand the movement of their own body and its impact on patients. Academic programs should consider their role in formally educating students on how to learn to use movement prior to sending them into clinical education experiences.

Prepare

In this study clinical instructors used a variety of effective teaching methods to prepare students to understand the complexities of movement use in their clinical practice setting. During this preparation, the instructor should be careful not to overwhelm the student. The instructor should use a consistent, simple approach, like the one offered by White (2011) and discussed in further detail in Chapter Five to help the student begin to understand and use movement. By using a specific and intentional strategy early in the preparatory process, instructors may decrease students' cognitive load and frustration when first attempting to understand the ambiguity and complexity in movement use.

Enhance

It was clear in this study that instructors optimize student learning when they can express their tacit knowledge of movement use through intentionally selected teaching strategies within the context of the patient case and clinical environment. Instructors should seek opportunities that enable them to reflect upon and articulate their tacit knowledge to students so that they can best demonstrate and describe their actions in patient care. Instructors should be trained to employ effective strategies for teaching movement use that are adaptable to the needs of diverse learners across practice settings. Currently the American Physical Therapy Association provides a credentialing program for clinical instructors (APTA, 2012c). This program includes content about adapting clinical teaching methods and addressing the unique needs of students. However, it does not specifically include instruction about teaching strategies for helping students learn to use movement and integrate it into their practice. The profession should consider ways in which it may help clinical instructors better assess their ability to express tacit knowledge and provide teaching strategies which effectively communicate their knowledge of movement use to students.

Additionally, a clinical practice setting with a community of practice would enhance the instructor's ability to intentionally direct teaching efforts for the needs of his or her student (Li et al., 2009; Schön, 1987; Waters, 2004; Wenger, 2006; Wenger, 1999). Focusing communities of practice on movement use and development will further help instructors and students alike to develop their skills. Clinics should consider establishing formalized mechanisms for clinicians to share their knowledge about movement, engage in

discussion about movement use, and exchange ideas about movement use in patient care. By establishing these communities of practice, clinical instructors would be better able to help their students realize the variability that exists in movement use and be prepared to discuss with students the different decisions clinical colleagues make in regards to movement use.

Connect

Instructors in this study played an important role connecting students' actions in movement use to the implications for patients' recovery and function. Through the use of discussion, reflection, literature, and patient education, instructors helped students make important connections between their clinical decisions in the present and the potential results of them in the future. Discussion and reflection are vital for furthering one's development as a clinician (Mann, Gordon, and MacLeod, 2009). Clinical instructors should provide opportunities for students to begin to practice making these connections through discussion and reflection early in the clinical internship. They can further these connections by providing frequent opportunities for students to articulate their decisions and actions, either through discussion or through educating their patients about movement use and its implications in their care.

This study found that the patient plays an important role in helping the student learn to integrate movement use in practice. The study also demonstrated that the patient is not always fully engaged in this process nor facilitated to provide feedback to the student. Clinical instructors should be trained to include the patient and empower them to provide

feedback to the student. Likewise, students should be trained to elicit effective feedback from their patient in regards to their movement use.

Develop

Finally, clinical instructors should strive to develop students' individualized philosophies of movement use. Clinical instructors should encourage students to integrate movement skills and strategies used by all of the clinicians with whom they interact to develop their own unique sense of movement use. By allowing students to engage in this sort of self-exploration, clinical instructors can foster growth and development in a student who is able to demonstrate his or her own uniqueness instead of mimicking the practice of the instructor. By facilitating the students' independent professional development in regards to movement use, the clinical instructor is establishing a trajectory that supports professional ways of being (Dall'alba, 2009a, 2009b) and may lead toward expertise in movement use.

Summary of Implications for Research and Practice

In summary, the findings of this study have significant implications for educational practice in physical therapy. I provide the following summary of recommendations for practice. The profession and its educational programs should:

- Educate clinical instructors in methods to select and adapt effective teaching strategies geared towards helping students learn to use movement in practice.
- Educate clinical instructors in ways to better reflect upon and articulate their tacit movement knowledge to students.

- Establish formalized communities of practice in clinical settings, allowing clinicians to engage in regular discussion and exchange information about their movement use.
- Include coursework or training developed to enhance students' body awareness.
- Train clinical instructors and students to engage patients in the learning process and elicit effective feedback from them.

Clinical instructors should:

- Prepare students to learn to use movement by using an effective and simple teaching methodology intended to decrease student frustration and cognitive load.
- Respond to students' learning needs by recognizing the emotional and stressful implications of needing to refine or adapt students' preferred learning style to be effective in learning to use movement.
- Enhance student integration of movement in practice by selecting teaching strategies, such as hand-over-hand instruction, that help students feel movement. Also allow students to independently problem solve by providing opportunities to use movement independently, free from constant feedback.
- Connect student movement use to patient outcomes through reflection, discussion, and opportunities to educate others about their clinical reasoning and movement use.

- Develop students' sense of a personal philosophy of movement by encouraging a practice identity separate from the clinical instructor's, thereby promoting a trajectory towards an embodied use of movement in their future practice.

Since this study focused on the physical therapist clinical instructor's role in student development of movement use in practice, I offer the following list of questions for clinical instructors to use as they reflect on their work with students:

- What teaching strategies do I use to help students use movement in practice?
- How do I select teaching strategies based on a student's individual needs when learning to use movement?
- How does my personal philosophy of movement use in practice influence my work with students?
- Does my practice setting have a mechanism for students to learn about movement use from other clinicians?
 - Do students in my practice setting have an opportunity to spend time in observation, practice, and discussion with colleagues that use movement in different ways from me?
- To what extent do students come to my practice setting aware of their body's movement?
 - What can I do to evaluate the impact of students' previous movement-related experiences and their influences on students' ability to use movement in my practice setting?

- What do I do to encourage my patients to be an active part of helping students learn to use movement in practice?
- What do I do early in the students' internship to prepare them for the complexity of movement use they will encounter in my clinical practice setting?
 - How can I mitigate their frustration and confusion with the ambiguity and complexity of movement use in my practice setting?
 - How can I be more succinct in my early instruction to help prepare them while not overwhelming them?
- How do I alter my teaching style to respond to the individualized needs of my students?
- How do I help students to discover their optimal learning style for movement use?
- When do I use hand-over-hand teaching as a way to help students use movement in practice?
- Do I allow students to safely experiment with movement use, free from constant feedback?
- How do I help students connect what they are doing with the intended outcomes of our patients?
- Do I promote student self-reflection about movement use?
- Do I allow for students to integrate movements learned from others or independently discovered in the treatment of patients?

- How do I ensure my students are ready to use movement in their independent practice following graduation from school?
- What can I do to ensure my students develop an embodied use of movement in their practice?

By reflecting on these questions, clinical instructors will be better prepared to establish an effective learning situation conducive for preparing students to learn, responding to students' needs, enhancing students' learning, connecting movement to patient outcomes, and developing a professional trajectory towards an embodied use of movement in practice.

The findings of this study represent new perspectives on physical therapist clinical instructors' process for perceiving and facilitating movement use in students' practice. A detailed understanding of this process will enable the physical therapy profession and its educators to best prepare students and instructors for the complexity and ambiguity inherent in teaching and learning to use movement in clinical practice. Future work should extend the findings of this study to larger samples including a wide variety of practice settings and specialties. As we maximize our understanding of how physical therapists develop movement use in practice, we can better develop future clinicians who are experts in the use of movement to improve the lives of their patients.

REFERENCES

- Adams, R. S., Daly, S. R., Mann, L. M., & Dall'Alba, G. (2011). Being a professional: Three lenses into design thinking, acting, and being. *Design Studies, 32*(6), 588-607. doi:10.1016/j.destud.2011.07.004
- Amann, T. (2003). *Creating space for somatic ways of knowing within transformative learning theory*. Paper presented at the Proceedings of the Fifth International Conference on Transformative Learning. New York: Teacher's College, Columbia University.
- American Occupational Therapy Association. (2013, March 30). About occupational therapy. Retrieved from <http://www.aota.org/Consumers.aspx>.
- American Physical Therapy Association. (1997). *Guide to physical therapist practice*. Alexandria, VA: American Physical Therapy Association.
- American Physical Therapy Association. (2004). *A normative model of physical therapist professional education: Version 2004*. Alexandria, Virginia: American Physical Therapy Association.
- American Physical Therapy Association. (2006a). *Guidelines: Clinical instructors* (BOD G03-06-21-55 ed.). Alexandria, Virginia: American Physical Therapy Association.
- American Physical Therapy Association. (2006b). *Guidelines: Clinical sites* (BOD G03-04-22-55 ed.). Alexandria, Virginia: American Physical Therapy Association.
- American Physical Therapy Association. (2006c). Physical therapist clinical performance instrument. *Alexandria, Virginia: American Physical Therapy Association.*

- American Physical Therapy Association. (2007). *Professional development, lifelong learning, and continuing competence in Physical therapy: HOD P05-07-14-14*. Alexandria, Virginia: American Physical Therapy Association.
- American Physical Therapy Association. (2010). *Physical therapist clinical education principles*. Alexandria, Virginia: American Physical Therapy Association. Retrieved from <http://www.apta.org/PTClinicalEducationPrinciples/>
- American Physical Therapy Association. (2012a). *Credentialed clinical instructor: Physical therapy credentialed clinical instructor program manual*. Alexandria, VA: American Physical Therapy Association.
- American Physical Therapy Association. (2012b). Professionalism & core values. Retrieved from <http://www.ptcas.org/Professionalism/>
- American Physical Therapy Association. (2012c). Vision 2020. Retrieved from <http://www.apta.org/Vision2020/>
- American Physical Therapy Association. (2013). *American physical therapy association: Positions, standards, guidelines, policies & procedures*. Alexandria, VA: American Physical Therapy Association.
- American Physical Therapy Association. (2015a, January 28). ABPTS certified specialists statistics. Retrieved from <http://www.abpts.org/About/Statistics/>
- American Physical Therapy Association. (2015b, January 28). Chapter market share. Retrieved from <http://www.apta.org/MembershipDevelopment/Statistics/>
- American Physical Therapy Association. (2015c, January 28). Credentialed clinical

instructor program (CCIP) overview. Retrieved from

<http://www.apta.org/CCIP/Overview/>

American Physical Therapy Association. (2015d, January 28). Demographic profile of physical therapist members. Retrieved from <http://www.apta.org/WorkforceData/>

American Physical Therapy Association. (2015e, January 28). American board of physical therapy residency and fellowship education. Retrieved from

<http://www.abptrfe.org/home.aspx>

American Physical Therapy Association. (2015f, January 28). APTA strategic plan.

Retrieved June 14, 2013, from <http://www.apta.org/StrategicPlan/Plan/>

American Physical Therapy Association. (2015g, January 28). Beyond vision 2020.

Retrieved from <http://www.apta.org/BeyondVision2020/>

American Physical Therapy Association. (2015h, January 28). Role of a physical therapist.

Retrieved June 5, 2013, from <http://www.apta.org/PTCareers/RoleofaPT/>

American Physical Therapy Association. (2015i, January 28). Who are physical therapists?

Retrieved June 3, 2013, from <http://www.apta.org/AboutPTs/>

Atkinson, H. L., & Nixon-Cave, K. (2011). A tool for clinical reasoning and reflection using the international classification of functioning, disability and health (ICF) framework and patient management model. *Physical Therapy, 91*(3), 416-430.

doi:10.2522/ptj.20090226

- Austin, L. (2013). Scaffolding early clinical learning for students in communication sciences and disorders. *Sig 11 Perspectives on Administration and Supervision*, 23(3), 86-91.
Retrieved from <http://sig11perspectives.pubs.asha.org/>
- Baptiste, I. (2001). Qualitative data analysis: Common phases, strategic differences. *Forum: Qualitative Social Research*, 2(3). Retrieved from <http://www.qualitative-research.net/index.php/fqs/article/viewArticle/917/2002>
- Benner, P. (1984). *From novice to expert: Excellence and power in clinical nursing practice*. Menlo Park, California: Addison-Wesley Publishing Company.
- Benner, P., Sutphen, M., Leonard, V., & Day, L. (2009). *Educating nurses: A call for radical transformation*. Stanford, California: Josser-Bass.
- Benner, P., Tanner, C., & Chesla, C. A. (1996). *Expertise in nursing practice: Caring, clinical judgment, and ethics*. New York, New York: Springer Publishing Company.
- Bereiter, C., & Scardamalia, M. (1993). *Surpassing ourselves: An inquiry into the nature and implications of expertise*. Chicago, Illinois: Open Court.
- Blakemore, C. L. (2003). Movement is essential to learning. *Journal of Physical Education, Recreation & Dance*, 74(9), 22-25.
- Brockman, J. (2001). A somatic epistemology for education. Paper presented at the *Educational Forum*, 65(4) 328-334. Retrieved from <http://dx.doi.org/10.1080/00131720108984514>
- Brookfield, S. (1995). *Becoming a critically reflective teacher*. San Francisco: Jossey-Bass.

- Brookfield, S. (1998). Critically reflective practice. *Journal of Continuing Education in the Health Professions*, 18(4), 197. Retrieved from <http://onlinelibrary.wiley.com/journal/10.1002/%28ISSN%291554-558X>
- Bryant, A., & Charmaz, K. (Eds.). (2007). *The SAGE handbook of grounded theory*. London, England: Sage Publications.
- Buccieri, K., Schultz, K., Dundy, J., Kolodziej, T., Malta, S., Marocco, S., Stolove, R. (2006). Self-reported characteristics of physical therapy clinical instructors: A comparison to the American Physical Therapy Association guidelines and self-assessments for clinical education. *Journal of Physical Therapy Education*, 20(1), 47.
- Bureau of Labor Statistics. (2012). Occupational outlook handbook. Retrieved from <http://www.bls.gov/ooh/Healthcare/Physical-therapists.htm>
- Caldwell, K., & Atwal, A. (2005). Non-participant observation: Using videotapes to collect data in nursing research. *Nurse Researcher*, 13(2), 42-54. doi:10.1046/j.1365-2648.2000.01383.x
- Case, K., Harrison, K., & Roskell, C. (2000). Differences in the clinical reasoning process of expert and novice cardiorespiratory physiotherapists. *Physiotherapy*, 86(1), 14-21. doi:10.1016/S0031-9406(05)61321-1
- Caston, J. M. (1982). Entry level education: Concerns about the proposed change. *Physical Therapy*, 62(1), 40-45. Retrieved from <http://ptjournal.apta.org/content/62/1/40>
- Chapparo, C., & Ranka, J. (2008). Clinical reasoning in occupational therapy. In J. Higgs, M. Jones, S. Loftus & N. Christensen (Eds.), *Clinical reasoning in the health professions*

(3rd ed.) [Kindle Edition]. Retrieved from

<http://www.amazon.com/b/?&node=1286228011>

Charlin, B., Tardif, J., & Boshuizen, H. P. (2000). Scripts and medical diagnostic knowledge:

Theory and applications for clinical reasoning instruction and research. *Academic*

Medicine, 75(2), 182-190. Retrieved from <http://journals.lww.com/academicmedicine/>

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. Thousand Oaks, California: Sage Publications.

Charmaz, K. (2008). Constructionism and the grounded theory method. In J. Holstein, & J.

Gubrium (Eds.), *Handbook of constructionist research*. New York: Guilford Press.

Christensen, N., Jones, M., Edwards, I., & Higgs, J. (2008). Helping physiotherapy students

develop clinical reasoning capability. In J. Higgs, M. Jones, S. Loftus & N. Christensen

(Eds.), *Clinical reasoning in the health professions* (3rd ed.) [Kindle Edition]. Retrieved from <http://www.amazon.com/b/?&node=1286228011>;

Clarke, A. (2005). *Situational analysis: Grounded theory after the postmodern turn*.

Thousand Oaks, California: Sage Publications.

Cohen, D. J., & Crabtree, B. F. (2008). Evaluative criteria for qualitative research in health

care: Controversies and recommendations. *The Annals of Family Medicine*, 6(4), 331-

339. doi:10.1370/afm.818

Commission on Accreditation in Physical Therapy Education. (2011). *Evaluative criteria for*

accreditation of education programs for the preparation of physical therapists.

Alexandria, Virginia: Commission on Accreditation in Physical Therapy Education.

Commission on Accreditation in Physical Therapy Education. (2014). *2012-2013 fact sheet physical therapist education programs*. Alexandria, Virginia: Commission on Accreditation in Physical Therapy Education.

Cooke, M., Irby, D., & O'Brien, B. (2010). In David M. Irby, Bridget C. O'Brien (Eds.), *Educating physicians: A call for reform of medical school and residency*. San Francisco, California: Jossey-Bass.

Coughlin, C. N., McElroy, L. T., & Patrick, S. C. (2009). See one, do one, teach one: Dissecting the use of medical education's signature pedagogy in the law school curriculum. *Georgia State University Law Review*, 26, 361.

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five traditions* (2nd ed.). Thousand Oaks, California: Sage Publications.

Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into Practice*, 39(3), 124-130. doi:10.1207/s15430421tip3903_2

Cromie, J. E., Robertson, V. J., & Best, M. O. (2002). Work-related musculoskeletal disorders and the culture of physical therapy. *Physical Therapy*, 82(5), 459-472.

Retrieved from <http://ptjournal.apta.org/>

Daley, B. (1999). Novice to expert: An exploration of how professionals learn. *Adult Education Quarterly*, 49(4), 133-147. doi:10.1177/074171369904900401

Dall'Alba, G. (1998). Medical practice as characterized by beginning medical students. *Advances in Health Sciences Education*, 3(2), 101-118. doi:10.1023/A:1009783602925

- Dall'Alba, G. (2002). Understanding medical practice: Different outcomes of a pre-medical program. *Advances in Health Sciences Education*, 7(3), 163-177.
doi:10.1023/A:1021194117367
- Dall'Alba, G. (2004). Understanding professional practice: Investigations before and after an educational programme. *Studies in Higher Education*, 29(6), 679-692.
doi:10.1080/0307507042000287195
- Dall'Alba, G. (2009a). Learning professional ways of being: Ambiguities of becoming. *Educational Philosophy and Theory*, 41(1), 34-45. doi:10.1111/j.1469-5812.2008.00475.x
- Dall'Alba, G. (2009b). *Learning to be professionals*. Dordrecht, New York: Springer.
- Dall'Alba, G., & Sandberg, J. (2006). Unveiling professional development: A critical review of stage models. *Review of Educational Research*, 76(3), 383-412. Retrieved from <http://rer.sagepub.com>
- Daly, S. R. (2008). *Design across disciplines*. (Ph.D., Purdue University). *ProQuest Dissertations and Theses*, Retrieved from <http://search.proquest.com>. (304501394).
- Daly, S. R., Adams, R. S., & Bodner, G. M. (2012). What does it mean to design? A qualitative investigation of design professionals' experiences. *Journal of Engineering Education*, 101(2), 187-219. Retrieved from www.jee.org
- Delitto, A. (2008). We are what we do. *Physical Therapy*, 88(10), 1219-1227.
doi:10.2522/ptj.2008.mcmillan.lecture

- Doody, C., & McAteer, M. (2002). Clinical reasoning of expert and novice physiotherapists in an outpatient orthopedic setting. *Physiotherapy*, 88(5), 258-268. doi:10.1016/S0031-9406(05)61417-4
- Doody, O., & Noonan, M. (2013). Preparing and conducting interviews to collect data. *Nurse Researcher*, 20(5), 28-32. Retrieved from <http://rcnpublishing.com/journal/nr>
- Dreyfus, H. L., & Dreyfus, S. E. (1986). *Mind over machine: The power of human intuition and expertise in the era of the computer*. New York, New York: Free Press.
- Dreyfus, H. L., & Dreyfus, S. E. (1996). The relationship of theory and practice in the acquisition of skill. In P. Benner, C. Tanner & C. A. Chesla (Eds.), *Expertise in nursing practice : Caring, clinical judgment, and ethics* (pp. 29-47). New York, NY: Springer Publication Company.
- Dutton, R. (1995). *Clinical reasoning in physical disabilities*. Baltimore, Maryland: Williams & Wilkins.
- Echternach, J. (2003). The political and social issues that have shaped physical therapy education over the decades. *Journal of Physical Therapy Education*, 17(3), 26-33. Retrieved from <http://www.aptaeducation.org/members/jopte/>
- Edwards, I., Jones, M., Carr, J., Braunack-Mayer, A., & Jensen, G. M. (2004). Clinical reasoning strategies in physical therapy. *Physical Therapy*, 84(4), 312-330. Retrieved from <http://ptjournal.apta.org/>

- Edwards, I., Jones, M., & Hillier, S. (2006). The interpretation of experience and its relationship to body movement: A clinical reasoning perspective. *Manual Therapy, 11*(1), 2-10. Retrieved from <http://www.manualtherapyjournal.com>
- Egan, T., & Jaye, C. (2009). Communities of clinical practice: The social organization of clinical learning. *Health, 13*(1), 107-125. doi:10.1177/1363459308097363
- Elstein, A. S., Shulman, L. S., & Sprafka, S. A. (1990). Medical problem solving: A ten-year retrospective. *Evaluation & the Health Professions, 13*(1), 5-36.
doi:10.1177/016327879001300102
- Embrey, D. G., Guthrie, M. R., White, O. R., & Dietz, J. (1996). Clinical decision making by experienced and inexperienced pediatric physical therapists for children with diplegic cerebral palsy. *Physical Therapy, 76*(1), 20-33. Retrieved from <http://ptjournal.apta.org/>
- Emery, M. J. (1984). Effectiveness of the clinical instructor. students' perspective. *Physical Therapy, 64*(7), 1079-1083. Retrieved from <http://ptjournal.apta.org/>
- Federation of State Boards of Physical Therapy. (2011). *The model practice act for physical therapy: A tool for public protection and legislative change* (5th ed.). Alexandria, Virginia: Federation of State Boards of Physical Therapy.
- Fonteyn, M. E., & Grobe, S. J. (1993). Expert nurses' clinical reasoning under uncertainty: Representation, structure, and process. Paper presented at the *Proceedings of the Annual Symposium on Computer Application in Medical Care*, 405.

- Fonteyn, M. E., & Ritter, B. J. (2008). Clinical reasoning in nursing. In J. Higgs, M. Jones, S. Loftus & N. Christensen (Eds.), *Clinical reasoning in the health professions* (3rd ed.) [Kindle Edition]. Retrieved from <http://www.amazon.com/>
- Foucault, M. (1972). *The Archeology of Knowledge and the Discourse on Language*. New York: Harper.
- Fugill, M. (2012). Tacit knowledge in dental clinical teaching. *European Journal of Dental Education*, 16(1), 2-5. Retrieved from <http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291600-0579>
- Fulton, J., & Hayes, C. (2012). Situational analysis-framing approaches to interpretive inquiry in healthcare research. *International Journal of Therapy & Rehabilitation*, 19(12), 662-669. Retrieved from <http://www.ijtr.co.uk>
- Glaser, B. G. (2002). Conceptualization: On theory and theorizing using grounded theory. *International Journal of Qualitative Methods*, 1(2), 23-38. Retrieved from <http://www.ualberta.ca/~iiqm/>
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory; strategies for qualitative research*. Chicago, Illinois: Aldine Publishing Company.
- Guba, E., & Lincoln, Y. (1982). Epistemological and methodological bases of naturalistic inquiry. *ECTJ*, 30(4), 233-252. Retrieved from <http://link.springer.com/>
- Guba, E., & Lincoln, Y. (2000). Competing paradigms in qualitative research. In N. K. Denzin, & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed.). Thousand Oaks, California: Sage Publications.

Gwyer, J. (1990). Resources for clinical education: Current status and future challenges.

Journal of Physical Therapy Education, 4(2), 55-58.

Gwyer, J., Odom, C., & Gandy, J. (2003). History of clinical education in physical therapy in

the united states. *Journal of Physical Therapy Education*, 17(3), 34-43. Retrieved from

<http://www.aptaeducation.org/members/jopte/>

Hack, L. M., & Gwyer, J. (2013). *Evidence into practice: Integrating judgment, values, and*

research. Philadelphia, PA: F.A. Davis Company.

Hanna, J. L. (2000). Learning through dance: Why your schools should teach dance.

American School Board Journal, 187(6), 47-48. Retrieved from <http://www.asbj.com/>

Hayes, K. W., Huber, G., Rogers, J., & Sanders, B. (1999). Behaviors that cause clinical

instructors to question the clinical competence of physical therapist students. *Physical*

Therapy, 79(7), 653-67. Retrieved from <http://ptjournal.apta.org/>

Henderson, A., Winch, S., & Heel, A. (2006). Partner, learn, progress: A conceptual model

for continuous clinical education. *Nurse Education Today*, 26(2), 104-109. doi:

10.1016/j.nedt.2005.07.008

Henry, S. G. (2006). Recognizing tacit knowledge in medical epistemology. *Theoretical*

Medicine and Bioethics, 27(3), 187-213. Retrieved from

<http://www.springer.com/philosophy/epistemology+and+philosophy+of+science/journal>

/11017

- Higgs, J., & Jones, M. (2008). Clinical decision making and multiple problem spaces. In J. Higgs, M. Jones, S. Loftus & N. Christensen (Eds.), *Clinical reasoning in the health professions* (3rd ed.,) [Kindle Edition]. Retrieved from <http://www.amazon.com/>
- Higgs, J., Jones, M., Loftus, S., & Christensen, N. (Eds.). (2008). *Clinical reasoning in the health professions* (3rd ed.) [Kindle Edition]. Retrieved from <http://www.amazon.com/>
- Holland, C. K. (1993). An ethnographic study of nursing culture as an exploration for determining the existence of a system of ritual. *Journal of Advanced Nursing*, 18(9), 1461-1470. Retrieved from <http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291365-2648>
- Holstein, J. A., & Gubrium, J. F. (Eds.). (2008). *Handbook of constructionist research*. New York, New York: Guilford Press.
- Holyoak, K. (1991). Symbolic connectionism: Toward third generation of theories of expertise. In K. A. Ericsson, & J. Smith (Eds.), *Toward a general theory of expertise: Prospects and limits*. New York, New York: Cambridge University Press.
- Horst, T. L. (2008). The body in adult education: Introducing a somatic learning model. Paper presented at the *Proceedings of the 49th Annual Adult Education Research Conference*, 162-167.
- Hrachovy, J., Clopton, N., Baggett, K., Garber, T., Cantwell, J., & Schreiber, J. (2000). Use of the blue MACS: Acceptance by clinical instructors and self-reports of adherence. *Physical Therapy*, 80(7), 652-661. Retrieved from <http://ptjournal.apta.org/>

- Irby, D. M., Cooke, M., & O'Brien, B. C. (2010). Calls for reform of medical education by the Carnegie foundation for the advancement of teaching: 1910 and 2010. *Academic Medicine, 85*(2), 220-227. doi:10.1097/ACM.0b013e3181c88449
- Jankovic, J., & Ashoori, A. (2008). Movement disorders in musicians. *Movement Disorders, 23*(14), 1957-1965. Retrieved from <http://onlinelibrary.wiley.com/journal/10.1002/%28ISSN%291531-8257>
- Jarski, R. W., Kulig, K., & Olson, R. E. (1990). Clinical teaching in physical therapy: Student and teacher perceptions. *Physical Therapy, 70*(3), 173-178. Retrieved from <http://ptjournal.apta.org/>
- Jensen, G. M. (1989). Qualitative methods in physical therapy research: A form of disciplined inquiry. *Physical Therapy, 69*(6), 492-500. Retrieved from <http://ptjournal.apta.org/>
- Jensen, G. M., Gwyer, J., Hack, L. M., & Shepard, K. F. (2007). *Expertise in physical therapy practice* (2nd ed.). St. Louis, MO: Saunders Elsevier.
- Jensen, G. M., Gwyer, J., Shepard, K. F., & Hack, L. M. (2000). Expert practice in physical therapy. *Physical Therapy, 80*(1), 28-43. Retrieved from <http://ptjournal.apta.org/>
- Jette, D. U., Bertoni, A., Coots, R., Johnson, H., McLaughlin, C., & Weisbach, C. (2007). Clinical instructors' perceptions of behaviors that comprise entry-level clinical performance in physical therapist students: A qualitative study. *Physical Therapy, 87*(7), 833-843. doi:87/7/833

- Jha, S. (1998). The Tacit–Explicit connection: Polanyian integrative philosophy and a neo-polanyian medical epistemology. *Theoretical Medicine and Bioethics*, 19(6), 547-568.
Retrieved from
<http://www.springer.com/philosophy/epistemology+and+philosophy+of+science/journal/11017>
- Johnson, G. R. (1985). Great expectations: A force in growth and change. *Physical Therapy*, 65(11), 1690-1695. Retrieved from <http://ptjournal.apta.org/>
- Jones, M., Jensen, G. J., & Edwards, I. (2008). Clinical reasoning in physiotherapy. In J. Higgs, M. Jones, S. Loftus & N. Christensen (Eds.), *Clinical reasoning in the health professions* (3rd ed.,) [Kindle Edition]. Retrieved from <http://www.amazon.com/>
- Kinchin, I. M., Cabot, L. B., & Hay, D. B. (2008). Using concept mapping to locate the tacit dimension of clinical expertise: Towards a theoretical framework to support critical reflection on teaching. *Learning in Health and Social Care*, 7(2), 93-104. Retrieved from <http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291473-6861>
- Knowles, P. D., Malcolm S., Swanson, R. A., & Holton, E. F. (2011). *Adult learner : The definitive classic in adult education and human resource development (7th edition)*. Saint Louis, MO, USA: Routledge.
- Keinänen, M., Hetland, L., & Winner, E. (2000). Teaching cognitive skill through dance: Evidence for near but not far transfer. *Journal of Aesthetic Education*, 34(3/4), 295-306.
- Kindblom-Rising, K., Wahlstrom, R., Nilsson-Wikmar, L., & Buer, N. (2011). Nursing staff's movement awareness, attitudes and reported behaviour in patient transfer before

and after an educational intervention. *Applied Ergonomics*, 42(3), 455-463.

doi:10.1016/j.apergo.2010.09.003

Lambert, V., & Glacken, M. (2005). Clinical education facilitators: A literature review.

Journal of Clinical Nursing, 14(6), 664-673. Retrieved from

<http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291365-2702>

Larsson, I., Miller, M., Liljedahl, K., & Gard, G. (2012). Physiotherapists' experiences of

physiotherapy interventions in scientific physiotherapy publications focusing on

interventions for children with cerebral palsy: A qualitative phenomenographic

approach. *BMC Pediatrics*, 12, 90. doi:10.1186/1471-2431-12-90

Latour, B. (1996). On actor-network theory: A few clarifications. *Soziale Welt*, 47(4), 369-

381. Retrieved from <http://www.jstor.org/stable/40878163>

Latvala, E., Vuokila-Oikkonen, P., & Janhonen, S. (2000). Videotaped recording as a method

of participant observation in psychiatric nursing research. *Journal of Advanced*

Nursing, 31(5), 1252-1257. doi:10.1046/j.1365-2648.2000.01383.x

Lave, J. (1991). *Situated learning : Legitimate peripheral participation*. New York, New

York: Cambridge University Press.

Li, L. C., Grimshaw, J. M., Nielsen, C., Judd, M., Coyte, P. C., & Graham, I. D. (2009).

Evolution of Wenger's concept of community of practice. *Implementation Science*, 4(1),

11. Retrieved from <http://www.implementationscience.com/>

- Littell, E. H., & Johnson, G. R. (2003). Professional entry education in physical therapy during the 20th century. *Journal of Physical Therapy Education, 17*(3), 3-14. Retrieved from <http://www.aptaeducation.org/members/jopte/>
- Lorenzo-Lasa, R., Ideishi, R. I., & Ideishi, S. K. (2007). Facilitating preschool learning and movement through dance. *Early Childhood Education Journal, 35*(1), 25-31. Retrieved from <http://link.springer.com/journal/10643>
- Mann, K., Gordon, J., & MacLeod, A. (2009). Reflection and reflective practice in health professions education: A systematic review. *Advances in Health Sciences Education, 14*(4), 595-621. Retrieved from <http://link.springer.com/journal/10459>
- Mattingly, C. (1991). The narrative nature of clinical reasoning. *The American Journal of Occupational Therapy, 45*(11), 998-1005. Retrieved from <http://ajot.aotapress.net>
- Merriam, S. B., Caffarella, R. S., & Baumgartner, L. (2007). *Learning in adulthood: A comprehensive guide* (3rd ed.). San Francisco, California: Jossey-Bass.
- Moffat, M. (2003). The history of physical therapy practice in the United States. *Journal of Physical Therapy Education, 17*(3), 15-25. Retrieved from <http://www.aptaeducation.org/members/jopte/>
- Morse, J. M., Barrett, M., Mayan, M., Olson, K., & Spiers, J. (2008). Verification strategies for establishing reliability and validity in qualitative research. *International Journal of Qualitative Methods, 1*(2), 13-22. Retrieved from <https://ejournals.library.ualberta.ca/>

- Morse, J. M., Swanson, J. M., & Kuzel, A. J. (2001). Constructing evidence within the qualitative project. *The nature of qualitative evidence*. Thousand Oaks, California: Sage Publications.
- Mostrom, E. (2013). What makes a good clinical teacher? In E. M. Gail M. Jensen, G. M. Jensen & E. Mostrom (Eds.), *Handbook of teaching and learning for physical therapists* (3rd ed.). St. Louis, Missouri: Elsevier/Butterworth-Heinemann.
- Mulder, U., & Whiteley, A. (2007). Emerging and capturing tacit knowledge: A methodology for a bounded environment. *Journal of Knowledge Management*, 11(1), 68-83. doi:10.1108/13673270710728240
- Murphy, W. B. (1995). *Healing the generations: A history of physical therapy and the American Physical Therapy Association*. Lyme, Connecticut: Greenwich Pub. Group.
- Nieland, V., & Harris, M. J. (2003). History of accreditation in physical therapy education. *Journal of Physical Therapy Education*, 17(3), 52-61. Retrieved from <http://www.aptaeducation.org/members/jopte/>
- Norman, G. (2005). Research in clinical reasoning: Past history and current trends. *Medical Education*, 39(4), 418-427. doi:10.1111/j.1365-2929.2005.02127.x
- Norman, G., Young, M., & Brooks, L. (2007). Non-analytical models of clinical reasoning: The role of experience. *Medical Education*, 41(12), 1140-1145. doi:10.1111/j.1365-2923.2007.02914.x
- Ohman, A. (2005). Qualitative methodology for rehabilitation research. *Journal of Rehabilitation Medicine*, 37(5), 273-280. doi:10.1080/16501970510040056

- Oxford University Press. (2013). Oxford dictionaries (US). Retrieved July 6, 2013, from <http://oxforddictionaries.com/us/definition/english/expert?q=expert>
- Palmer, H. (2001). The music, movement, and learning connection. *Young Children*, 56(5), 13-17.
- Pascal, K. (2002). Techniques for teaching students in clinical settings. In K. Shepard, G. Jensen & J. Black (Eds.), *Handbook of teaching for physical therapists* (2nd ed.). Boston, Massachusetts: Butterworth-Heinemann.
- Patel, V. L., & Groen, G. J. (1991). The general and specific nature of medical expertise: A critical look. In K. A. Ericsson, J. A. & Smith (Eds.), *Toward a general theory of expertise: Prospects and limits*. Melbourne, Australia: Cambridge University Press.
- Petty, N. J., Scholes, J., & Ellis, L. (2011a). The impact of a musculoskeletal masters course: Developing clinical expertise. *Manual Therapy*, 16(6), 590.
doi:10.1016/j.math.2011.05.012"
- Petty, N. J., Scholes, J., & Ellis, L. (2011b). Master's level study: Learning transitions towards clinical expertise in physiotherapy. *Physiotherapy*, 97(3), 218.
doi:10.1016/j.physio.2010.11.002"
- Physical Therapist Centralized Application Service. (2012). *Physical therapist centralized application service 2011-2012 applicant data report*. Alexandria, Virginia: American Physical Therapy Association.
- Pica, R. (1995). *Experiences in movement with music, activities, and theory*. Albany, New York: Delmar Publishers.

- Pociask, F. D., Morrison, G. R., & Reid, K. R. (2013). Managing cognitive load while teaching human gait to novice health care science students. *Journal of Physical Therapy Education, 27*(1), 58. Retrieved from <http://www.aptaeducation.org/members/jopte/>
- Polanyi, M., 1891-1976. (1958). *Personal knowledge; towards a post-critical philosophy*. Chicago, University of Chicago Press.
- Purtilo, R. B. (2000). A time to harvest, a time to sow: Ethics for a shifting landscape. *Physical Therapy, 80*(11), 1112-1119. Retrieved from <http://ptjournal.apta.org/>
- Ridderikhoff, J. (1989). *Methods in medicine: A descriptive study of physicians' behaviour*. Norwell, Massachusetts: Kluwer Academic Publishers.
- Roach, K., Frost, J. S., Francis, N. J., Giles, S., Nordrum, J. T., & Delitto, A. (2012). Validation of the revised physical therapist clinical performance instrument (PT CPI): Version 2006. *Physical Therapy, 92*(3), 416-428. doi:10.2522/ptj.20110129
- Rose, M. (1999). "Our hands will know": The development of tactile diagnostic skill: Teaching, learning, and situated cognition in a physical therapy program. *Anthropology & Education Quarterly, 30*(2), 133-160. Retrieved from <http://www.jstor.org/stable/3196070>
- Rothstein, J. M. (1998a). Education at the crossroads: For today's practice, the DPT. *Physical Therapy, 78*(4), 358-360. Retrieved from <http://ptjournal.apta.org/>
- Rothstein, J. M. (1998b). Education at the crossroads: Which paths for the DPT? *Physical Therapy, 78*(5), 454-457. Retrieved from <http://ptjournal.apta.org/>

- Rutherford, O., & Jones, D. (1986). The role of learning and coordination in strength training. *European Journal of Applied Physiology and Occupational Physiology*, 55(1), 100-105.
- Sackett, D. L., Rosenberg, W., Gray, J., Haynes, R. B., & Richardson, W. S. (1996). Evidence based medicine: What it is and what it isn't. *British Medical Journal*, 312(71), 1840. doi:10.1136/bmj.312.7023.71
- Sage Publications, L. (2006). The Sage dictionary of social research methods. Retrieved from <http://dx.doi.org/10.4135/9780857020116>
- Sahrmann, S. A. (1998). Moving precisely? or taking the path of least resistance? *Physical Therapy*, 78(11), 1208-1219. Retrieved from <http://ptjournal.apta.org/>
- Schell, B. A., & Cervero, R. M. (1993). Clinical reasoning in occupational therapy: An integrative review. *The American Journal of Occupational Therapy*, 47(7), 605-610. doi:10.5014/ajot.47.7.605
- Schenkman, M., Deutsch, J. E., & Gill-Body, K. M. (2006). An integrated framework for decision making in neurologic physical therapist practice. *Physical Therapy*, 86(12), 1681-1702. doi:10.2522/ptj.20050260
- Schmidt, R. A., & Lee, T. (2011). *Motor control and learning : A behavioral emphasis* (5th ed.). Champaign, Illinois: Human Kinetics.
- Schön, D. A. (1987). *Educating the reflective practitioner*. San Francisco, California: Jossey-Bass.

- Schwartz, A., & Elstein, A. S. (2008). Clinical reasoning in medicine. In J. Higgs, M. Jones, S. Loftus & N. Christensen (Eds.), *Clinical reasoning in the health professions* (3rd ed.) [Kindle Edition]. Retrieved from <http://www.amazon.com/>
- Schumacher, D. J., Englander, R., & Carraccio, C. (2013). Developing the master learner: Applying learning theory to the learner, the teacher, and the learning environment. *Academic Medicine: Journal of the Association of American Medical Colleges*, 88(11), 1635-1645. doi:10.1097/ACM.0b013e3182a6e8f8
- Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 22(2), 63-75. Retrieved from <http://www.iospress.nl/journal/education-for-information/>
- Shepard, K. F., Jensen, G. M., Schmoll, B. J., Hack, L. M., & Gwyer, J. (1993). Alternative approaches to research in physical therapy: Positivism and phenomenology. *Physical Therapy*, 73(2), 88-97. Retrieved from <http://ptjournal.apta.org>
- Silverman, D. (2001). Credible qualitative research. In D. Silverman (Ed.), *Interpreting qualitative data: Methods for analyzing talk, text and interaction* (2nd ed.). London, England: Sage Publications.
- Simon, H. A., & Newell, A. (1971). Human problem solving: The state of the theory in 1970. *American Psychologist*, 26(2), 145-159. doi:10.1037/h0030806
- Singer, R. N. (1988). Strategies and metastrategies in learning and performing self-paced athletic skills. *The Sport Psychologist*.

- Skjaerven, L. H., Kristoffersen, K., & Gard, G. (2007). An eye for movement quality: A phenomenological study of movement quality reflecting a group of physiotherapists' understanding of the phenomenon. *Physiotherapy Theory and Practice, 24*(1), 13-27. Retrieved from <http://informahealthcare.com/ptp>
- Skjaerven, L. H., Kristoffersen, K., & Gard, G. (2010). How can movement quality be promoted in clinical practice? A phenomenological study of physical therapist experts. *Physical Therapy, 90*(10), 1479-1492. doi:10.2522/ptj.20090059
- Strauss, A. L. (1987). *Qualitative analysis for social scientists*. New York, New York: Cambridge University Press.
- Strauss, A. L., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, California: Sage Publications.
- Sturmberg, J. P., & Martin, C. M. (2008). Knowing-in medicine. *Journal of Evaluation in Clinical Practice, 14*(5), 767-770. Retrieved from <http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291365-2753>
- Suominen, T., Kovasin, M., & Ketola, O. (1997). Nursing culture: some view points. *Journal of Advanced Nursing, 25*(1), 186-190. Retrieved from <http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291365-2648>
- Swisher, L. L., & Hiller, P. (2010). The revised APTA code of ethics for the physical therapist and standards of ethical conduct for the physical therapist assistant: Theory, purpose, process, and significance. *Physical Therapy, 90*(5), 803-824. doi:10.2522/ptj.20090373

- Townsend, A., Cox, S. M., & Li, L. C. (2010). Qualitative research ethics: Enhancing evidence-based practice in physical therapy. *Physical Therapy, 90*(4), 615-628. doi:10.2522/ptj.20080388
- Tuthill, J. (2008). See one, do one, teach one. *The Lancet, 371*(9628), 1906. Retrieved from <http://www.thelancet.com/>
- Waters, M. (2004). Educating the reflective GP: Schon revisited. *Education for Primary Care, 15*(4), 631-634. Retrieved from <http://www.radcliffehealth.com/periodical/education-primary-care>
- Wenger, E. (1999). *Communities of practice: Learning, meaning, and identity*. New York, New York: Cambridge University Press.
- White, G. (2011). Mental load: Helping clinical learners. *The Clinical Teacher, 8*(3), 168-171. Retrieved from <http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291743-498X>
- Wimpenny, P., & Gass, J. (2000). Interviewing in phenomenology and grounded theory: Is there a difference? *Journal of Advanced Nursing, 31*(6), 1485-1492. doi:10.1046/j.1365-2648.2000.01431.x
- World Health Organization. (2001). *International classification of functioning, disability, and health*. Geneva, Switzerland: World Health Organization.
- Wulf, G., & Prinz, W. (2001). Directing attention to movement effects enhances learning: A review. *Psychonomic Bulletin & Review, 8*(4), 648-660. Retrieved from <http://www.springer.com/psychology/cognitive+psychology/journal/13423>

- Young, R. A., Valach, L., Dillabough, J., Dover, C., & Matthes, G. (1994). Career research from an action perspective: The self-confrontation procedure. *The Career Development Quarterly*, 43(2), 185. Retrieved from <http://search.proquest.com/docview/219421740?accountid=10598>
- Zatorre, R. J., Chen, J. L., & Penhune, V. B. (2007). When the brain plays music: Auditory-motor interactions in music perception and production. *Nature Reviews Neuroscience*, 8(7), 547-558. Retrieved from <http://www.nature.com/nrn/index.html>
- Zimerman, A. (1999). Evidence-based medicine: A short history of a modern medical movement. *Virtual Mentor (Online)*; *Virtual Mentor*. 15(1), 71-76. Retrieved from <http://virtualmentor.ama-assn.org/>

APPENDICES

Appendix A

Screening Interview Guide

Hello and thank you for agreeing to speak with me today. _____, your Center Coordinator of Clinical Education, indicated you may be an ideal candidate for the research study I'm conducting. This study is about how clinical instructors perceive certain aspects of practice in their students. Specifically, I'm interested in learning more about how clinical instructors help students use the movement of their own hands and bodies as they work with patients/clients.

This is a qualitative study. Participants will need to agree to participate in two interviews each about 90 minutes in length. I will also need to come and observe you working with your student/instructor three times during their internship. Finally, I will review your CPI assessment after the internship is completed.

Your clinical facility may also have requirements for allowing me to observe a treatment session and I can work with them to obtain this approval. During all the interviews and observations, I am interested in discovering how the instructor interacts with the student, gives feedback, and assess the students' abilities. There is no right or wrong way to do this. In fact, we know very little about how instructors help their students learn to use their hands and bodies, so I'm just trying to learn more.

I will be working with a small number of participants, so I'm currently screening all the people nominated by the DCE's and then will narrow down to a few for participation in the full study. I have a few questions for you, but first, do you have any for me?

Questions for Instructors:

- 1) How long have you been a PT?
- 2) How long have you been a CI?
- 3) How many students have you supervised on a full-time internship?
- 4) Have you completed the APTA Credentialed Clinical Instructor Program?
- 5) Do you have any advanced practice certifications? If so, what are they?
- 6) What is your primary practice environment and patient caseload?
- 7) Is it true that you have a student coming from _____ University during the dates of _____? And will you be their primary CI?
- 8) Can you tell me a little bit about how you use “movement” including your hands and body to work with your patients?
- 9) What influence do you think this has on your treatment?
- 10) Would you be willing to be interviewed twice, and observed working with your students 3 times during this upcoming internship?
- 11) Do you think your facility / managers would have any concerns?
 - a. Who can I speak with about getting approval for video and observation?
- 12) Do you have any questions?
- 13) Can you confirm the best email/phone number to contact you?

Thank you so much for your time today. I will be in touch soon about participating in the next round of this research study.

Questions for Students:

- 1) What was your undergraduate major?
- 2) Where have you completed other internships as a PT student?
- 3) Would you be willing to let me include data from your CPI in my study.
Everything will be completely de-identified and your anonymity protected.
- 4) Would you be willing to be interviewed twice, and observed working with your instructor 3 times during this upcoming internship?
- 5) Do you have any questions?
- 6) Can you confirm the best email/phone number to contact you?

Thank you so much for your time today. I will be in touch soon about participating in the next round of this research study.

Appendix B

Interview One Guide for Instructors

Thank you again for participating in this study. I appreciate all of the time you are devoting to this important project. I will be audio recording the interview today. This will help me to record everything that is said. I also may take some notes from time to time. Just to remind you, this study is for my PhD dissertation at North Carolina State University. All of the information you share with me will be confidential. Your identity will be protected and all data will be securely stored.

This study is about how clinical instructors work with their students. Specifically I'm interested in the use of movement, for example how you help students learn to use their hands and bodies to treat their patients and how this becomes an integrated part of who they are. We know that PT's are experts in movement and we also know that PTs use their hands and bodies all the time to help treat our patients. But we know little about how PT's integrate this into their practice and how that influences how we develop professionally. For example, I have noticed in myself, that I often will instinctively place my hands on my children in the right places to help them move or catch their balance, however other parents I observe do not do this. Clearly, I have integrated some part of my professional knowledge and skills into who I am. I am curious to know more about how this process begins during our time as students. I am sure you have a lot of valuable information that can help me. Today, I have several questions for you about your background and experiences as a PT and as a CI.

Just to start, a few questions I asked you during the screening call, but I need to ask again.

- 1) How long have you been a PT?
- 2) How long have you been a CI?
- 3) How many students have you supervised on a full-time internship?
- 4) Have you completed the APTA Credentialed Clinical Instructor Program?
- 5) Do you have any advanced practice certifications? If so, what are they?
- 6) What is your primary practice environment and patient caseload?

Like I said before, we know that PTs use the movement of their own bodies to help their patients' function improve. When I talk about "using movement" I mean: the use of the therapist's own hands or body, including their positioning and action, to assess, examine, or effect change in their patient.

- 7) With this in mind, can you tell me how you define the use of movement specific to your practice?
- 8) Now, think back through your years of school and practice. Try to tell me, in as much detail as possible, the many influences you have had that have helped you to develop this use of movement in your practice.

Prompt as needed:

- a. School
- b. Continuing education
- c. Mentors

d. Patient examples

e. Students

- 9) Now I want you to think about your role as a clinical instructor. Describe for me how you help your students learn to integrate “{movement}” into their practice with your patients. {may insert language from participant’s definition}

Prompt as needed:

- a. How do you create opportunities for students to integrate using movement?
- b. How do you provide feedback

Prompt as needed:

- i. Verbally
- ii. Tactilely
- iii. Demonstration
- iv. Examples of how you help the student practice
- v. Examples of the things you tell students they need to improve/change
- vi. Case examples you provide to students
- c. How do you know when they are successful?

- 10) Can you tell me about a time when you had a student who had trouble learning to use {movement in practice}? {may insert language from participants definition here} and how you addressed this.

11) We know that the process of learning and professional development is difficult. The PT profession often speaks of the “Gray Areas” of practice, or the ambiguous nature of our decisions when working with patients. I’m curious if you can describe for me some of the ambiguous or “Gray Areas” you notice for students as they try to learn how to use {movement} while working with your patient population?

Prompt as needed:

- a. *continuity over time with change* in ways of being professionals;
 - i. Students enter a professional training program with notions of what it means to be a member of that profession, these notions are dramatically refined during the formal educational program, and continually mature as the clinician develops. However, their original basis of understanding of who they would be as a member of the profession plays a role.
- b. *possibilities in the ways we can be with constraints*;
 - i. When refining ways of being professionals are shown a myriad of possibilities in practice, however they may be constrained by their previous notions, conceptions or experiences.
- c. *openness in taking up possibilities with resistance* to doing so;
 - i. “However, where there is some openness to re-thinking assumptions and mutual respect among practitioners, new ways of

acting and being can come into play, bringing about a renewal of practice at both individual and collective levels” (Dall’Alba, 2009a, p. 42)

- d. *individuals* who are becoming professionals *with others* involved in that process.
 - i. However, a profession must embrace the individuality of its members, thus creating and interdependence on the individual and the group.

We need to schedule a time for me to come and observe you working with the student, preferably sometime in the first two weeks of the internship. I would like to watch for about 90 minutes with one or two patients that you expect to be working closely with the student. Can we schedule that now?

I will be transcribing this interview and sending you a copy. If you read the copy and think there are errors or wish to correct or add any information, please do so. Thanks again for your time and insights today. Confirm for me your mailing address.

Appendix C

Interview One Guide for Students

Thank you again for participating in this study. I appreciate all of the time you are devoting to this important project. I will be audio recording the interview today. This will help me to record everything that is said. I also may take some notes from time to time. Just to remind you, this study is for my PhD dissertation at North Carolina State University. All of the information you share with me will be confidential. Your identity will be protected and all data will be securely stored.

This study is about how clinical instructors work with their students. Specifically I'm interested in the use of movement, for example how you help students learn to use their hands and bodies to treat their patients and how this becomes an integrated part of who they are. We know that PT's are experts in movement and we also know that PTs use their hands and bodies all the time to help treat our patients. But we know little about how PT's integrate this into their practice and how that influences how we develop professionally. For example, I have noticed in myself, that I often will instinctively place my hands on my children in the right places to help them move or catch their balance, however other parents I observe do not do this. Clearly, I have integrated some part of my professional knowledge and skills into who I am. I am curious to know more about how this process begins during our time as students. This study is about how clinical instructors work with their students. Specifically I'm interested in how students learn to use their hands and bodies to treat their

patients. I am sure you have a lot of valuable information that can help me. Today, I have several questions for you about your background and experiences as a PT student.

Just to start, a few questions I asked you during the screening call, but I need to ask again.

- 1) What was your undergraduate major?
- 2) Where did you complete your other internships?
- 3) Were your previous internship experiences positive?
 - a. If “no”, ask why.

Like I said before, we know that PTs use the movement of their own bodies to help their patients’ function improve. When I talk about “using movement” I mean: the use of the therapist’s own hands or body to assess, examine, or effect change in their patient.

- 4) Can you tell me what you think about when I mention using “movement” to help our patients?
- 5) Based on your experiences prior to this internship, describe for me how you have learned to integrate “{movement}” into practice with your patients. {may insert language from participant’s definition}

Prompt as needed:

- a) *classes*
- b) *labs*
- c) *conferences*
- d) *clinical instructors*

e) individual practice

- 6) Can you tell me about a time when you had had trouble learning to use {movement in practice}? {may insert language from participants definition here} and how you addressed this.
- 7) We know that the process of learning and professional development is difficult. The PT profession often speaks of the “Gray Areas” of practice, or the ambiguous nature of our decisions when working with patients. I’m curious if you can describe for me some of the ambiguous or “Gray Areas” you’ve noticed for students as they try to learn how to use {movement} while working with your patient population?

Prompt as needed:

- a. *continuity over time with change* in ways of being professionals;
- i. Students enter a professional training program with notions of what it means to be a member of that profession, these notions are dramatically refined during the formal educational program, and continually mature as the clinician develops. However, their original basis of understanding of who they would be as a member of the profession plays a role.
- b. *possibilities in the ways we can be with constraints*;

- i. When refining ways of being professionals are shown a myriad of possibilities in practice, however they may be constrained by their previous notions, conceptions or experiences.
 - c. openness in taking up possibilities *with resistance* to doing so;
 - i. “However, where there is some openness to re-thinking assumptions and mutual respect among practitioners, new ways of acting and being can come into play, bringing about a renewal of practice at both individual and collective levels” (Dall’Alba, 2009a, p. 42)
 - d. *individuals* who are becoming professionals *with others* involved in that process.
 - i. However, a profession must embrace the individuality of its members, thus creating and interdependence on the individual and the group.
- 8) That’s all of my questions for today. Do you have anything else you would like to add?

I will be transcribing this interview and sending you a copy. If you read the copy and think there are errors or wish to correct or add any information, please do so. Thanks again for your time and insights today. Confirm for me your mailing address.

Appendix D
Observation Matrix

Date: _____ Time: _____ Location: _____

Subject: _____ Patient Encounter Number:

Other People Present: _____ Permission Obtained: Yes /

No

Time	Activity	Notes	Embodi- ment	Continuity/ Change	Possibilities/ Constraints	Openness / Resistance	Individuals / Others

Appendix E

Interview Two Guide for Instructors

Thank you for all of the time you have allowed these past few weeks for me to talk to you and your student and spend time watching you with your patients. Today I want to spend some time talking about the experiences you have had with this particular student. When we talked during the first interview you described your use of movement in your practice as *{INSERT PARTICIPANT'S ANSWER}*.

- 1) Please describe, in detail, from the beginning of the internship to the end, how this student progressed in their use of movement. How did you help facilitate this change?
- 2) Can you describe a specific time the student struggled to integrate movement in their practice?
 - a. Why do you think this was so difficult?
 - b. How did you help them overcome this?
- 3) I made some notes during the observations that I wanted to discuss with you. As we discuss each of these, please try to describe for me your perceptions of the student during these moments and your reasoning and thoughts.

Insert observations intended to represent the following:

- a. *continuity* over time *with change* in ways of being professionals;
- b. possibilities in the ways we can be *with constraints*;
- c. openness in taking up possibilities *with resistance* to doing so;

- d. *individuals* who are becoming professionals *with others* involved in that process.
 - i. *Follow up with each scenario: How do you think this particular event shaped the students' use of movement during the internship?*
- 4) What role does the patient play for helping the student integrate their use of movement in practice?
- 5) How do you think working with this student has influenced your use of movement in practice and/or clinical education?
- 6) When we talked during the first interview you described your use of movement in your practice as *{INSERT PARTICIPANT'S ANSWER}*.
 - a. Do you think the student is now able to demonstrate this use of movement?
 - b. Why or why not?
- 7) I have heard other therapists state that they have a “style” or “personality” of movement use. Can you describe for me the student’s “movement style” with patient care?
- 8) What are your predictions for this students continued development as a professional who utilizes movement in his/her practice?
- 9) That’s all of my questions for today. Do you have anything else you would like to add?

Thank you for your time today. Just as before, I will be providing you with a transcript of this interview. If, after you review it, you think something needs to be changed or you wish to add

anything please let me know. Can you provide me with a good address to mail the transcript to you? I will also be happy to share the findings of the study with you if you are interested. Thank you again for your dedication to the process.

Appendix F

Interview Two Guide for Students

Thank you for all of the time you have allowed these past few weeks for me to talk to you and spend time watching you with your patients. Today I want to spend some time talking about the experiences you have had during this internship. When we talked during the first interview you described your use of movement in your practice as *{INSERT PARTICIPANT'S ANSWER}*.

- 1) Please describe, in detail, from the beginning of the internship to the end, how you progressed in your use of movement. How did your instructor help facilitate this change.
 - a. How did you “prepare” yourself to use movement with patients.
- 2) Can you describe a specific time that you struggled to integrate movement into your practice?
 - a. Why do you think this was so difficult?
 - b. How did your instructor help you overcome this?
- 3) Can you describe a specific time that succeeded in integrating movement in your practice?
 - a. Why do you think made you successful?
- 4) I made some notes during the observations that I wanted to discuss with you. As we discuss each of these, please try to describe for me how your instructor helped during these moments and your reasoning and thoughts.

Insert observations intended to represent the following:

- a. *continuity* over time *with change* in ways of being professionals;
- b. possibilities in the ways we can be *with constraints*;
- c. openness in taking up possibilities *with resistance* to doing so;
- d. *individuals* who are becoming professionals *with others* involved in that process.

i. *Follow up with each scenario: How do you think this particular event shaped your use of movement during the internship?*

- 5) What are some of the things that motivate you to improve your use of movement?
- 6) How do you your instructor has influenced your use of movement in practice?
- 7) How have your patients influenced your use of movement in practice?
- 8) Talk me through your future development as a physical therapist.
 - a. The remainder of classwork?
 - b. More internships?
 - c. How do you think you will continue to use/integrate movement in your practice?
 - d. How will it change?
 - e. Has your instructor changed the way you think your career will progress?
- 9) When we talked during the first interview you described your use of movement in your practice as *{INSERT PARTICIPANT'S ANSWER}*.
 - a. Would you describe the use of movement the same or differently now?
 - b. If different, how so?

- 10) Do you believe you successfully integrated movement into practice? Why or why not?
- 11) I have heard other therapists state that they have a “style” or “personality” of movement use. Can you describe your “movement style” with patient care?
- 12) That’s all of my questions for today. Do you have anything else you would like to add?

Now that your internship is completed, can we arrange for me to get a copy of our completed Clinical Performance Instrument, including your self-assessment and your instructor’s assessment? Thank you for your time today. Just as before, I will be providing you with a transcript of this interview. If, after you review it, you think something needs to be changed or you wish to add anything please let me know. Has your address changed? I will also be happy to share the findings of the study with you if you are interested. Thank you again for your dedication to the process.

Appendix G

Code Book

Note: Grey rows represent parent codes with child codes following in white rows. The 'Source' column indicates the number of different interviews, observations, or documents in which the code was identified. The 'References' column indicates the total number of times the code was identified.

Code Name	Sources	References	Code Definition
Affecting my patients' through movement use	0	0	Parent node that includes participants' descriptions of how they <i>use</i> movement when working with their patients.
by placing my hands intentionally	32	111	Participants intentionally choose their hand placement on the patient's body to effect change. This placement may require the PT to move their hands from time to time in a calculated and intentional way.
by positioning my body to use movement	34	98	Participants describe selecting the static or dynamic position of their body relative to their patients.
by progressing the patient's movement	19	25	Participants use their own body to dynamically progress the patient's movement either directionally (ex: walking forward) or in difficulty (ex: by challenging the patient's balance with perturbations from the PT).

Code Name	Sources	References	Code Definition
by promoting increased function in the patient	18	36	Participants use their own body to change the patient's functional mobility (ex: moving the patient from sit to stand, or rolling the patient, etc).
by providing safety	21	58	Participants use their own movement to ensure the safety of their patients during therapeutic tasks.
by responding to the needs of the patients	20	38	Participants use the movement of their own body as guided by the needs of the patient. Participants must choose their movement or alter their movement based on the patient's response, reaction, direction, emotional needs, etc.
by coordinating my movement with the patient (aka dancing)	11	21	Child node to above. This is the same concept but more specifically described as moving "in tandem with" the patient rather than "in response to" several participants likened it to "a dance".
by teaching movement to pts and families	21	57	Participants participated in many sessions in which they taught their patients or family members how to use movement to aide in recovery or promote function. This was also used by CI's as a teaching tool for the student.

Code Name	Sources	References	Code Definition
by using NDT	6	17	Neurodevelopmental Training (NDT) was specifically described as a movement/treatment philosophy useful in affecting the movement of patients.
by using adjunctive therapies	6	18	Using the therapists own movement in combination with another therapeutic tool (ex: tactile facilitation in combination with electrical stimulation therapy)
by using verbal commands	9	11	Using verbal commands in combination with or in isolation as a progression of the PT's own movement use.
Developing Movement Use	0	0	Parent node which includes categorical "events" that were discussed as vital to the development of movement use in therapists
Previous experiences	13	48	The code includes any experience, interest, talent, etc, that may have played a role in the therapist's ability to use and learn to use movement now. (examples: athlete, dancer, parent who is a therapist)
Becoming aware of your own	13	31	The process of gaining insight

Code Name	Sources	References	Code Definition
movement			into how your own body moves
Preparing	12	22	The process of readying oneself to work with the patient, and more specifically using movement to ready the patient for further therapy
Asking for help in learning	13	33	Any description or demonstration of the student or mentee verbally asking for help to learn to use movement.
Correcting movement use	27	81	Descriptions or demonstrations of how the instructor/mentor corrects movement use.
Connecting ideas about movement use	15	39	Descriptions or demonstrations of a participant advancing knowledge or understanding of how to use movement by extrapolating thoughts to another concept or thinking more deeply about a concept related to movement use. Or put another way advancement in one's thoughts about movement use.
Signs of development	24	96	Descriptions or demonstrations of advancement in the use of movement related skills

Code Name	Sources	References	Code Definition
Duration for learning movement	12	26	Descriptions or predictions of how long it takes to learn to use movement skills
Reflecting on my movement use	16	44	Participant's <i>critical</i> reflections on their own use of movement and development of their use of movement
Movement Style	16	28	A description of one's own or another therapist's distinct and/or unique way of using movement in their practice. Or put another way, a tangible movement use philosophy.
Career Development of Student	9	13	Description or prediction of the student participant's future career development both in general or specifically related to movement use.
Clinical Reasoning	9	12	A specific description of the use of clinical reasoning in movement use decision-making
Embodied knowing of movement	15	29	A description or demonstration of a deeply ingrained use of movement in practice, often without the subject's own full awareness prior to the movement of self discovery or observation.

Code Name	Sources	References	Code Definition
Automatically performing movement	24	55	A motoric demonstration of tacit skill or ability in movement use.
Describing tacit knowledge	20	48	The participant reflecting and describing their own tacit knowledge related to clinical care and/or movement use.
Facilitators and Inhibitors of Learning movement	0	0	This parent node contains descriptions or demonstrations of things that assist or detract from learning to use movement in practice.
Ambiguity	14	24	A description or demonstration of something that is unclear, confusing, or multifaceted specific to the use of movement in practice. It is neither a facilitator nor inhibitor, but rather could be considered either by the participant. Additionally that consideration could change from time to time.
Facilitators	6	11	Descriptions of things that make learning to use movement easier, better, or more impactful.
Trust	5	15	A specific description of a facilitator necessary between the instructor and student or student and patient in order to learn to use

Code Name	Sources	References	Code Definition
			movement.
Understanding your student	5	10	A specific facilitator in which the instructor/mentor is able to capitalize on their knowledge of the student/mentee's personality, skill, previous experience to teach movement use.
Learning style preferences	6	8	Often this is described in the context of "understanding your student" but this specifically relates to the students actual or perceived learning style both didactically and clinically.
Willingness to learn	13	23	A specific facilitator in which the student/mentee is eager and open to learning and trying movement.
Inhibitors	14	29	Descriptions of things that make learning to use movement difficult, worse, or less impactful.
Resisting	14	45	Description or demonstration of hesitancy or resistance on the part of the learner related to movement use. Sometimes described or insinuated to be a "tentativeness" on the part of the learner.
Emotions in	0	0	This parent node contains descriptions or demonstrations of

Code Name	Sources	References	Code Definition
Learning			emotional responses to developing a use of movement in practice
Admiring mentor's movement skills	7	21	The mentee/student describes a deep admiration for the mentor's ability to use movement in their practice.
Anxiety	10	18	The mentee/student describes or demonstrates anxiety during the process of learning to use movement.
Awkward	2	4	The mentee/student describes or demonstrates a feeling of awkwardness during the process of learning to use movement.
Confidence (over or under)	25	74	The mentee/student describes or demonstrates their level of confidence during the process of learning to use movement.
Exciting	5	15	The mentee/student describes or demonstrates excitement during the process of learning to use movement.
Fatiguing to learn (mental)	2	5	The mentee/student describes or demonstrates mental fatigue during the process of learning to use movement.

Code Name	Sources	References	Code Definition
Fatiguing to use (physical)	5	11	The mentee/student describes or demonstrates physical fatigue during the process of learning to use movement.
Frustrating	12	29	The mentee/student describes or demonstrates frustration during the process of learning to use movement.
Fun	2	11	The mentee/student describes or demonstrates a feeling of “fun” during the process of learning to use movement.
Overwhelming	8	14	The mentee/student describes or demonstrates a sense of being overwhelmed during the process of learning to use movement.
Pressuring yourself	3	4	The mentee/student describes or demonstrates placing pressure on oneself during the process of learning to use movement.
Movement use is described as	3	5	The participant describes or defines what movement use is. (Coded segments in this parent node are defined in more general terms)
complex	13	25	A specific description of

Code Name	Sources	References	Code Definition
			movement use being complex.
problem solving	10	19	A specific description of how movement use demands a problem solving approach.
specific	11	22	A specific description of movement use as targeted and specific.
subtle	10	25	A specific description of movement use as subtle, sometimes described as “less is more”.
Movement use is enhanced by	4	6	This parent nodes includes descriptions or demonstrations of things, processes, or teaching methods that enhance the learners ability to use movement and integrated it into their practice. Text coded here was described in more generalized process terms rather than in specific teaching/learning methods.
being questioned	5	5	The process of being questioned or quizzed helps learn to use movement. The student/mentee gains by explaining their own reasoning for using the movement or hand placement they chose.

Code Name	Sources	References	Code Definition
collaborating with others (students, colleagues, etc)	19	43	The process of working with others helps the learner integrate and understand their use movement better.
considering the evidence	3	11	Juxtaposing evidence based literature on the clinical decision making and use of movement skill.
experiencing the feeling of using movement	18	50	Description or demonstration of the learner experiencing how the tactile cue, hand placement, force, etc may feel to the patient by experiencing it themselves.
with CI's hands over student's hands	19	29	More specifically than above, the learner having the instructor's hands over their own with the learners hands on the patient, thus allowing the instructor to use their own movement to affect the patient via the students hands. This allows the student to feel the direction and level of force employed by the instructor.
feedback from patients	15	29	Any feedback from the patient that enables the student to adjust their movement use.
listening to others	19	39	The learner's ability to listen to their mentors either in a "lecture" format or during the mentor's

Code Name	Sources	References	Code Definition
			treating sessions.
mentally visualizing movement use	7	10	The learner's attempts to visualize how they will move their body or place their hands as a way to solidify their development of movement use.
mentors other than the CI	10	24	Interactions with mentors other than the learner's direct instructor who provide insight, skill instruction, etc. related to movement use.
mimicking others	21	35	Watching a mentor perform a movement then attempting to replicate it when working with the patient.
moving my own body	6	8	By physically moving one's own body with the sole purpose being to learn to move one's own body, often in absence of the patient being present.
observing others using movement	24	83	Watching the instructor or other mentors as they treat patients in an effort to learn how to move one's own body and hands when treating patients.
planning and discussing how to	15	31	The process of discussing with the instructor before, during, and after

Code Name	Sources	References	Code Definition
use movement			the treatment to better understands how to use movement.
practicing movement on others	12	23	When the learner practices their hand placement, positioning, cueing, etc on someone other than the patient.
repetition and practice	13	31	The process of repeated practice of a developing movement skill.
touching and feeling	9	26	The process of placing one's hands on the patient to gain knowledge about the patient which will be useful for choosing what movement to use. For example, feeling the patient's muscle tone to make decisions about how to treat the patient.
treating the patient and learning in action	23	64	The process of learning to use movement by treating the patient and experiencing movement use in the moment. Sometimes this was associated with "trial and error" learning.

Appendix H

Social Worlds/Arenas Map

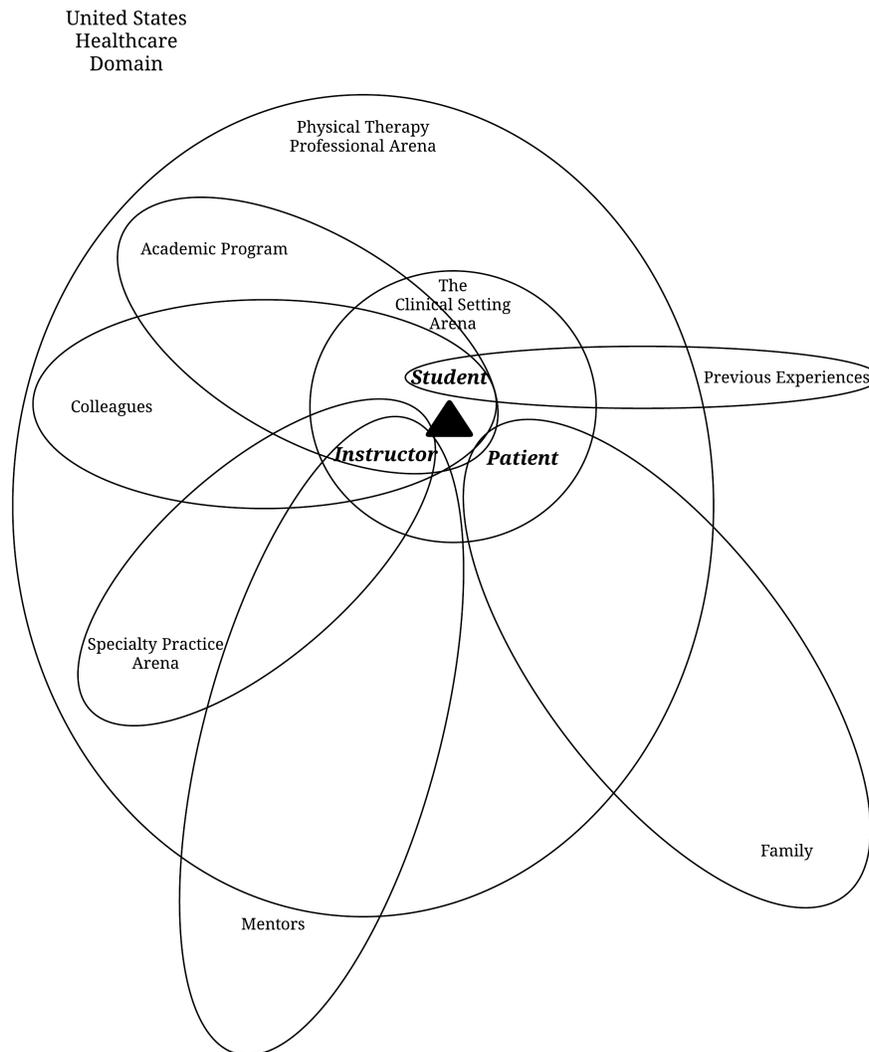


Figure H1. Social Worlds/Arenas map depicting the various social influences on the learning relationship between the student, instructor, and patient. Arenas and domains are assumed to have structured parameters that likely influence the learning relationship.