THE RELATIONSHIP OF WORK EXPERIENCE TO CLINICAL PERFORMANCE IN A MASTER OF PHYSICAL THERAPY PROGRAM

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ABSTRACT

Carolyn Palmer, Advisor

Research has extensively documented the impact of experience on learning. However, there are currently no studies within the physical therapy (PT) literature that address the relationship between work experience and clinical performance. The purpose of my research was to explore this relationship. The study, involving 155 students who completed a master of physical therapy (MPT) program between 2003 and 2006, examined differences in the clinical performance of two groups: nontraditional students who had worked as physical therapy assistants before entering the MPT program, and traditional students who had not.

Clinical instructors used the *Clinical Performance Instrument* (CPI) to record midterm and final evaluations of student performance on 24 professional skills. For most of the skills, the two groups did not differ significantly in degrees of change from midterm to final scores. Final evaluations showed that the nontraditional students scored higher than the traditional students on all 24 skills and significantly higher on half of the skills. They also had a significantly higher number of *exceptional* scores. Further analyses showed that the number of years of work experience, age, and cumulative grade point average of the nontraditional students were not significantly correlated with their scores on most of the skills.

The qualitative data provided in the comment sections of the CPI, along with the responses to a survey completed by clinical instructors who had worked with both groups of students in 2006, supported the quantitative findings. That is, clinical instructors consistently indicated that the nontraditional students demonstrated better clinical performance than did the traditional students.
The results of this study have implications for graduate programs in PT and other health care professions. Recommendations for practice include considering previous work experience in the admissions process and developing programs that help nontraditional students adjust to graduate programs and prepare for transitions between the coursework and clinical phases of their programs. Future research should investigate other factors that may contribute to clinical performance outcomes or to the group differences found in this study.
DEDICATION

This dissertation is dedicated to my family. My husband and children have provided me with endless amounts of support and encouragement to accomplish my educational goals. It is through my family that I have been blessed with the gift of learning. Not only have I learned about the fundamentals of the research process, but also I have learned a lot about myself as a person throughout the past five years in my doctoral program.

The success of my journey is definitely attributed to my husband, Dan, and my children. Dan has certainly given me unconditional love from the initiation of this journey to its final completion. Without his strong belief in my abilities, skills, and desires, I would never have dreamed of pursuing such a challenging venture. Not only did he provide me with emotional support; he took over many family responsibilities, as needed on many occasions.

I also appreciate my children, Elisabeth Marie, Sarah Kathleen, and Daniel Joseph, who have all expressed their pride and respect for my journey of learning. My oldest, Elisabeth, has been a solid pillar of assistance with all sorts of family duties from car pooling to cooking dinners. Her support allowed me the time to attend my classes and maintain a sense of normality within our family life. In many ways, she has represented the glue in our family!

My middle child, Sarah, has helped me with my confidence to continue this journey on more than one occasion. She tends to look at the world in a positive way and has always encouraged me to do so as well. In all difficult situations, she has told me, “You can do it, mom.” Believe it or not, she was right!
Finally, there’s my youngest, Danny. He has taught me that one must always maintain a balance between work and play. There is great value in taking time to relax and have fun. Not only did this light-hearted rest allow me to recharge by battery while maintaining my focus, but it also lead to creative and unique ideas. And certainly Danny has promoted some truly creative thoughts!

In short, I want to thank my family from the deepest level of my heart for all of their unconditional support and love. I know that my journey has transformed me as a person and I have greatly benefited from this experience. Thank you for allowing me to accomplish one of my dearest dreams.
ACKNOWLEDGMENTS

I am so appreciative of many other individuals who have made this dissertation possible. Without my foundation of learning this journey would never have been initiated. I attribute my lifelong quest of learning to my parents, Dr. John and Mrs. Charlene Nemunaitis. My parents have always emphasized the importance of learning and always following my dreams. I hope that this family tradition will continue with my children.

The execution of my journey was with the assistance of the talented faculty of Bowling Green State University. Of primary importance, I wish to thank my committee chair and advisor, Dr. Carolyn Palmer, for her endless encouragement and meticulous assistance with this dissertation. She advised me on many, many aspects of the research process. But more importantly, she taught me to believe in my ability to complete my doctoral program. Her ongoing faith and support has allowed me to be successful with this journey!

While accompanying me on this journey, my committee members, Dr. Stephen Langendorfer, Dr. Robert DeBard, and Dr. Michael Coomes, have each brought forth an extra unexpected gift. I appreciate the specific written comments that Dr. Stephen Langendorfer provided on my dissertation proposal. His comments allowed me to become more exact with my finished product and gave me a sense of what it means to be a scholar.

Dr. Robert DeBard has taught me the importance of being myself and yet allowing compromise. I have discovered that I do not have to loose myself in order to fit in the many contexts of my life. It is through my observations of his interactions during my committee meetings and on other occasions that I have come to a greater understanding of what it means to be unique and creative.
Dr. Michael Coomes has probably challenged me the most, causing me to think critically about my work each phase of this journey. I honestly can say that I now understand why mixed methods research is difficult to conduct and interpret. I know that I have farther to go with the development of my abilities to join theory with practice. But I feel as though I have an excellent start. His way of questioning me has fostered my ability to question myself. He also taught me to limit the number of exclamation points I use! Opps!

There are so many other faculty members from BGSU that I appreciate. Among the most helpful during my journey were Dr. Fiona MacKinnon and Dr. Nancy Boudreau. I had the luxury of spending considerable time discussing multiple topics concerning learning theories and the adult learner with Dr. Fiona MacKinnon. It was an experience that I will never forget, one that reminded me of the days of Socrates. I am also indebted to Dr. Nancy Boudreau for her patience and assistance with the multiple statistical procedures that needed to be performed as part of my dissertation process.

I am also grateful for the endless support that The University of Findlay, my colleagues, and my friends have given me over the past four years. There are so many to acknowledge: Dr. Lisa Dutton for her inspiration to begin my doctoral journey; Dr. Julie Toney for her assistance with my qualitative research and the traditional students’ data; Dr. Robert Frampton for his sense of humor and overall program assistance; Ms. Rebecca Quintus for her aid with accessing references; Ms. Sarah Hingson for her editing skills; and several work-study students for all their assistance with the data gathering process. Most importantly I wish to thank my dear friend, Cindy Fry, who has provided me with unconditional positive regard and respect. Her confidence in my abilities kept me going
during the rough times. She also assisted me with the clinical supervisor questionnaire and other projects that required confidentiality.

This phase of my journey is now complete and I ask myself, “What next?” I can honestly say that I’m not sure. Only time will tell what I may accomplish in the future. But I know that how I set and reach my goals is even more important than what goals I achieve. After all it is the journey that really matters. Through this journey, I have had invaluable learning experiences all along the way that have transformed me as a person. Thank you to all who have helped me make this journey successful!
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CHAPTER I. INTRODUCTION

There has been considerable growth in the numbers of nontraditional students, often referred to as adult learners, who attend higher education institutions across the United States. Brady (1999) reported that 44% of all students are 25 years or over, 54% are employed, and 43% are part-time students. From 1992 to 2002, higher education enrollment of students 25 or over rose by 13% and has been projected to further increase by 19% from 2002 to 2014 (National Center for Education Statistics [NCES], 2005).

In addition to the growth in the older, nontraditional student population, there has been an increase in the diversity of students according to race, ethnicity, and gender. For example, the number of students who belong to racial or ethnic minority groups increased from 1992 to 2002 by 29% and the number of women increased by 61% (NCES, 2005). This increasingly diverse student population has brought varied expectations, abilities, and needs to the learning experience (Brady, 1999; Elwell, 1999).

Most nontraditional students have been oriented towards acquiring employment that will provide financial and career well being. To achieve economic security, many students have chosen to participate in graduate or professional programs that are work-related. Between 1976 and 2004 enrollment increased by 62% in graduate programs and by 37% in professional programs (NCES, 2005). Due to the rapid growth in the numbers of nontraditional students in higher education institutions, instructors need to understand how to facilitate the learning process in the most effective manner for the adult learner population.

Before determining effective learning strategies, there needs to be an identification of the differences between nontraditional students and traditional students. The research summarized in this dissertation differentiates traditional students from nontraditional students who have worked
as physical therapy assistants (PTAs) and chose to return to a professional program to advance their careers as physical therapists. I chose to focus on their past professional work experience and its impact on learning and performance in the clinical setting. Other variables considered in this study were cumulative grade point average (GPA) and age. The remainder of this chapter includes the significance and purpose of the study, the research questions and hypotheses, and the definitions of the individual clinical skills and variables involved in this research.

**Significance of Study**

Not only has there been greater public demand for work-related educational programs, but there has been a particular need for health care programs in areas such as physical therapy (PT). The United States Department of Labor (2005) projected that employment opportunities for physical therapists will grow much faster than the average occupation through 2014. They reported that the demand for physical therapists should increase due to a number of reasons:

1. a growth in the number of survivors with disabilities or injuries,
2. an increased elderly population with chronic conditions,
3. the baby-boom generation’s increased incidence of heart attacks and strokes,
4. widespread interest in the promotion of health and wellness, and
5. businesses that are proactive with reducing injuries in the workplace.

With this public demand, there is a definite need for high quality physical therapists and for graduate level programs that prepare them most effectively for their profession.

Admission to professional programs typically requires training from at least a four-year college institution of higher education, resulting in a baccalaureate degree. Physical therapy programs, now only at the graduate level, offer students the advanced degrees needed to take licensing examinations. For example, individuals must have earned at least a master of physical
therapy (MPT) degree before they can obtain licenses to practice physical therapy in Ohio and many other states.

Professional programs are distinguished from vocational programs in that they have their own unique body of knowledge, values, and skills (Etzioni, 2000). These programs usually consist of a formal academic component and a practical applied experience (Mintzberg, 1989). Today’s PT programs must include both academic coursework and clinical practice experiences within their curriculum (American Physical Therapy Association [APTA], 2005). I chose to examine the clinical practice experiences that follow the completion of the PT program’s academic coursework.

The academic content is typically organized to include foundational sciences, clinical sciences, and the roles of physical therapists. Foundational science courses provide background information needed to succeed in subsequent courses that apply basic concepts to the theories and practices specifically related to physical therapy. For example, human anatomy, biomechanics, and pharmacology are considered foundational science courses. The clinical science courses are directly related to the care of the client. Some examples of such courses are pathology, orthopedic interventions, and clinical examination. The courses related to the roles of physical therapists emphasize their responsibilities as educators, professional leaders, researchers, and managers. The selection of the academic content of PT courses has resulted from a continually evolving body of knowledge based on the scholarly work of expert physical therapists and other professionals. It should be emphasized that the two groups of students involved in this study completed the same academic courses and thus have been exposed to the same body of knowledge related to physical therapy.
The clinical practice experiences inherent in PT programs are designed to apply the academic content in real world situations. They may consist of part-time, full-time, or a combination of part-time and full-time clinical affiliations. The actual number of clinical education hours varies greatly among the programs in the United States. Gwyer (1990) reported that the average number of weeks in a full-time clinical affiliation is 23 weeks (4,600 hours), with a range of 15 to 72 weeks. The traditional students involved in this study had a total of 28 weeks (i.e., two six-week and two eight-week affiliations interspersed periodically throughout the curriculum) and the nontraditional students had 24 weeks (i.e., four six-week affiliations at the end of the curriculum). Even though the clinical experiences were arranged differently for the two groups of students, Ingram and Hanks (2001) reported that such a difference in scheduling the clinical experiences of PT students does not have an impact on clinical performance.

With the explosion of knowledge and technology related to physical therapy, the experiential learning component of the curriculum is especially important. Through clinical experiences learners can develop necessary knowledge, skills, and attitudes required to address PT problems and assist clients as effectively as possible. The research summarized in this dissertation focused on what I consider to be a critical component of the PT curriculum, the clinical practice experience. Specifically, I attempted to identify similarities and differences in the clinical performance of two groups of PT students from The University of Findlay (UF), who completed clinical experiences at multiple locations throughout the United States and (in one case each) in Canada and England. The two groups included: (a) traditional PT students who had no past professional work experience and (b) nontraditional PT students who had one year or more of work experience as physical therapy assistants. The expected educational outcome for
both groups of students was the same: the completion of a Master of Physical Therapy (MPT) degree.

At present, all PT programs in the United States are at the graduate level. As of July 2005, Reis reported that there were 70 institutions that granted MPT degrees and 140 institutions that granted Doctor of Physical Therapy (DPT) degrees. There has been movement towards higher levels of degrees not only for physical therapists, but also for physical therapy assistants. In 2005, there were 234 accredited PTA programs that granted PTA degrees, all at the associate’s level (Reis, 2005). However, it should be noted that all of the nontraditional students in this study had completed not only PTA programs, but also baccalaureate programs prior to their acceptance into UF’s MPT program.

There are two higher education institutions in the United States that are unique in that they admit licensed PTAs with baccalaureate degrees into their PT programs. Of these two, The University of Findlay is the only institution that has both a PTA to MPT program and a traditional MPT program. Upon graduation, both groups of UF students are granted Master of Physical Therapy degrees. Even though both groups sought this degree, their preparation for graduate study in physical therapy differed. Both groups had to possess a bachelor’s degree and must have completed prerequisite coursework, particularly in the natural sciences and statistics, prior to entrance into the PT programs offered by UF. However, the nontraditional PT students also had completed the coursework required for their associate’s degrees in PTA and had worked full-time as PTAs for a minimum of one year before entering the PT program.

In addition to the different admissions requirements, these two groups of students may have differed in ways that affected their program experiences. For example, Schuetze and Slowey (2002) reported that nontraditional students have not only more life experiences (based
simply on having lived for a longer period of time), but also more diverse life experiences as compared to traditional students. They further discussed how these past experiences could affect adult learners’ entry into higher education, their chosen modes of study, and the learning process as a whole. Many other authors have reported that past experience has an effect on learning in multiple ways (Argyris, 1982; Dewey, 1933; Hull, 1943; Kolb, 1984; Thorndike, 1913; Wilson, Teslow, & Osman-Jouchoux, 1995). My dissertation research focused on one type of past experience, work as a physical therapy assistant, and the impact such experience may have had on the clinical performance of PT students.

Whether the effect of past experience on learning is positive, negative, or non-existent depends upon several factors, which vary according to different learning theorists. In general, the research literature has emphasized the importance of integrating past experience with new information in the learning process (Graham, Donaldson, Kasworm, & Dirkx, J. 2000; Knowles, 1984; Knowles, Holton, & Swanson, 1998; Knowles, Holton, & Swanson, 2005). It may be that adult learners are more suited to learn about a certain topic or develop a certain skill because their life experiences have helped them to develop a positive philosophy about learning, practice learning strategies in a variety of contexts, and/or understand the relevance or usefulness of the knowledge or skill involved. They may have a larger set of knowledge and skills they can use to make connections between real life and new learning (Knowles, 1984). They may have greater motivation to persist and succeed in learning due to a variety of factors (Graham, Donaldson, Kasworm, & Dirkx, J. 2000). For example, they may have personal interest in the topic of study, may desire career advancement or personal improvement, or may understand the consequences of failure. The adult learners involved in my study may have performed better in the clinical setting because their previous experiences (e.g., as students in PTA programs and as practicing
PTAs in clinical settings) helped them to develop knowledge, skills, and attitudes that were further enhanced as a result of their participation in an MPT program.

Purpose of the Study

Currently no information exists within the PT professional literature that addresses the effect(s) of past professional work experience on learning or performance in the clinical setting. However, I have been informed in personal communications with many clinical instructors (CIs) that they have observed important differences in the clinical performance of traditional students and nontraditional students who have had past professional experiences as PT assistants. Although most of these CIs have informally reported better clinical performance on the part of students with previous experience as PT assistants, the nature and extent of group differences in clinical performance have not been formally assessed. Thus, the purpose of this study was to explore and describe the relationship(s) between past professional experience and the clinical performance of physical therapy students in a master’s program at a liberal arts university, The University of Findlay.

Research Questions and Hypotheses

Research Question One

The first research question focused on describing the differences between two groups of students concerning their clinical performance at two time periods. Specifically, I asked whether there were significant differences in the clinical performance scores of traditional students and nontraditional students at the midterm and at the final. This first question involved a total of 24 sub-questions, each assessed at two points in time. Are there significant differences in the mean scores of the two groups with respect to:

1. Safety at the midterm? At the final?
2. Responsibility at the midterm? At the final?
3. Professionalism at the midterm? At the final?
4. Ethical practice at the midterm? At the final?
5. Legal practice at the midterm? At the final?
6. Communication at the midterm? At the final?
7. Documentation at the midterm? At the final?
8. Sensitivity to cultural diversity at the midterm? At the final?
9. Critical inquiry at the midterm? At the final?
10. Screening performance at the midterm? At the final?
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13. Ability to determine plan of care at the midterm? At the final?
14. Treatment of others at the midterm? At the final?
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16. Ability to address quality of care at the midterm? At the final?
17. Consultation at the midterm? At the final?
18. Service management at the midterm? At the final?
19. Resource management at the midterm? At the final?
20. Fiscal management at the midterm? At the final?
21. Use of support personnel at the midterm? At the final?
22. Professional and social responsibility at the midterm? At the final?
23. Career and lifelong learning plans at the midterm? At the final?
24. Wellness management at the midterm? At the final?
Research Question Two

I next explored the degree of change (from the midterm to the final) in the clinical performance scores of the two groups. This question was important to ask because it was presumed that the students with work experience as PTAs began their clinical affiliations with better professional skills. Thus, they would outperform traditional students at the midterm, but as a result of the clinical experience itself, the traditional students may catch up with the nontraditional students by the time their final evaluation was completed. Specifically, I asked whether there were significant group differences in the mean changes (from the midterm to the final) of the clinical performance scores associated with the twenty-four professional skills listed in association with research question one.

Research Questions Three and Four

The third research question explored differences in total numbers of exceptional scores obtained by the two groups of students. Exceptional was the highest possible rating provided on the evaluation form. This research question asked whether there were significant differences between traditional students and nontraditional students in the mean numbers of exceptional scores given for clinical performance at the midterm and at the final.

The fourth research question asked whether there were significant differences between the two groups of students in the mean numbers of not observed skills recorded at the midterm and at the final. This question was considered because I wanted to determine whether the CIs had observed (or recorded scores for) similar numbers of skills being practiced by members of the two groups.
Research Question Five

I also wanted to investigate the extent to which three demographic variables were related to the clinical performance of the nontraditional students. The three factors considered were: (a) years of work experience, (b) cumulative grade point average, and (c) age. I primarily wanted to find out whether there was an optimum number of years, or a cut-off point in the number of years, of work experience that were associated with better clinical performance. I also wanted to see whether GPA and age were related to clinical performance. This research question involved a total of 144 sub-questions organized in three areas. For the nontraditional students (only), are there significant correlations between:

1. Years of work experience and clinical performance scores in the 24 skill areas at the midterm? At the final?
2. Cumulative grade point average and clinical performance scores in the 24 skill areas at the midterm? At the final?
3. Age and clinical performance scores in the 24 skill areas at the midterm? At the final?

Hypotheses

Due to subjective feedback provided by clinical instructors, as briefly described earlier in this chapter, along with the learning theories and research findings summarized in Chapter II, it was tempting to offer two a priori hypotheses. These hypotheses would suggest that (a) the clinical performance of nontraditional students, all of whom had past experience as PTAs, would be rated higher than that of traditional students and (b) the number of years the nontraditional students had worked as PTAs would be significantly correlated with their clinical performance scores.
Because no previous research concerning the relationship of past professional experience to the clinical performance of PT students had been conducted to support or fail to support such a priori hypotheses, statistical analyses tested only null hypotheses. This choice was further supported by the possibility that other variables (e.g., life experience, maturity, academic performance) could confound the effect of past professional work experience on clinical performance.

The null hypotheses were:

1. The clinical performance scores of traditional and nontraditional students did not differ significantly at either the midterm or the final,

2. The degree of change (from the midterm to the final) in the clinical performance scores of traditional and nontraditional students did not differ significantly,

3. The total numbers of *exceptional* scores did not differ significantly for the traditional and nontraditional students at either the midterm or the final,

4. The total numbers of *not observed* skills did not differ significantly for the traditional and nontraditional students at either the midterm or the final, and

5. The clinical performance scores of nontraditional students were not significantly related (i.e., either positively or negatively) to the number of years they had worked as physical therapy assistants, their cumulative grade point average, or their age.

**Definitions**

Clinical performance was defined as student performance in the clinical setting based on a set of 24 professional skills, as presented by the American Physical Therapy Association (APTA, 1997):
1. Safety: “Practices in a safe manner that minimizes risk to patient, self, and others” (p. 1),
2. Responsibility: “Presents self in a professional manner” (p. 2),
3. Professionalism: “Demonstrates professional behavior during interactions with others” (p. 3),
4. Ethical: “Adheres to ethical practice standards” (p. 4),
5. Legal: “Adheres to legal practice standards” (p. 5),
6. Communication: “Communicates in ways that are congruent with situational needs” (p. 6),
7. Documentation: “Produces documentation to support the delivery of physical therapy services” (p. 7),
8. Cultural diversity: Adapts delivery of physical therapy care to reflect respect for and sensitivity to individual differences” (p. 8),
9. Critical inquiry: “Applies the principles of logic and the scientific method to the practice of physical therapy” (p. 9),
10. Screening: “Screens patients using procedures to determine the effectiveness of and need for physical therapy services” (p. 10),
11. Examination: “Performs a physical therapy patient examination” (p. 11),
12. Evaluation: “Evaluates clinical findings to determine physical therapy diagnoses and outcomes of care” (p. 12),
13. Plan of care: “Designs a physical therapy plan of care that integrates goals, treatment, outcomes, and discharge plan” (p. 13),
14. Treatment: “Performs physical therapy interventions in a competent manner” (p. 14),
Clinical instructors used a visual rating scale within *The Clinical Performance Instrument* (APTA, 1997) to record student performance on each of the 24 skills both at the midterm and during the final week of the affiliation. This evaluation tool used to assess the clinical
performance of PT students is further described in Chapter III. Because this is a secure and copyright protected instrument, I was not able to provide a complete copy in the dissertation. With the permission of APTA (See Appendix A), a sample page from the instrument is provided in Appendix B.

Nontraditional PT students were defined as PT students who had one or more years of previous work experience as physical therapy assistants before entering the PTA to MPT program at The University of Findlay. Traditional students, in contrast, had no such work experience before entering the MPT program.

Professional experience was defined as any work activity that was performed as a physical therapy assistant. It was recorded in years of documented practice.

Cumulative grade point average was defined as the final grade point average that the student obtained upon graduation from the master of physical therapy (MPT) program at The University of Findlay. Finally, age was defined as students’ documented age (rounded to the closest number of years) upon initiation of the final clinical affiliation.

As was previously indicated, the main focus of this study was the clinical performance of nontraditional students and the relationship to their past professional experience as PTAs. Two other variables that could have affected their performance in their final clinical affiliation would be their cumulative GPA in the PT program and age when they began their final clinical affiliation. Therefore, the relationship of clinical performance to these independent variables was examined in the study described in this dissertation.
CHAPTER II. LITERATURE REVIEW

Literature has extensively documented the importance of past experience to learning (Argyris, 1982; Dewey, 1933; Hull, 1943; Knowles, 1984; Knowles, Holton, & Swanson, 1998; Knowles, Holton, & Swanson, 2005; Kolb, 1984; Schuetze and Slowey, 2002; Thorndike, 1913; Wilson, Teslow, & Osman-Jouchoux, 1995). This chapter provides a summary of this literature; presents major learning theories in an organized fashion ranging from objectivism to constructivism; and identifies some of the major factors that affect the learner, learning process, learning outcomes, and relationship between experience and learning.

Also provided in Chapter II is information concerning adult learners, or nontraditional students and ways in which they are similar to and different from traditional students. In doing so, I emphasized the one factor that has most consistently facilitated the learning process and the accomplishment of learning outcomes. This factor involves the extent to which previous experience and new learning are well integrated.

One learning outcome that is especially important to students in a PT program is successful clinical performance. Unfortunately, there are no studies within the PT professional literature that have addressed the extent to which various life or work experiences contribute to this particular outcome. Hence, the main purpose of this study was to investigate the relationship of past work experience with clinical performance. A final topic addressed in this chapter is PT clinical performance and how it can be measured.

Learning Theories

Over the years many individuals have pondered the dynamics of the learning process, resulting in a multitude of theories including behaviorism, information processing, and transformational learning. These theories may be broadly categorized along a continuum having
endpoints representing two opposing philosophies: objectivism and constructivism (see Figure 1). Objectivist theories, which describe instructors and factors in the external environment as being in total control of the learning experience, lie at one end of the spectrum. At the opposite end are the constructivist theories, claiming that learners construct and actively make meaning of their own learning experiences.

*Figure 1. Categorization of Learning Theories*

<table>
<thead>
<tr>
<th><strong>Objectivism</strong></th>
<th><strong>Constructivism</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>(Instructor is in total control)</em></td>
<td><em>(Students own experience)</em></td>
</tr>
</tbody>
</table>
| Behaviorists  
* (S → R) | Hull  
* (Drives & cues) |
| Cognitivists  
* (Internal maps) | Transformationalists  
* (Own construction) |

The traditional approach to learning that relies on objectivism has been referred to as the “banking method,” whereby students acquire “deposits of information considered by the teacher to be true knowledge, and the students store these deposits, intact, until needed” (Abdal-Haqq, 1998, p. 2). Duffy and Jonassen (1992) reported that objectivism underlies both behaviorist and information processing theories, which are described in the next two sections of this chapter.

*Behaviorism: An Emphasis on the Stimulus-Response Bond*

For the behaviorist, learning is a matter of simply acquiring existing information through a stimulus-response process (Pavlov, 1927; Skinner, 1938, 1958; Thorndike, 1913; Watson, 1913). Behaviorists emphasize outward observable behaviors rather than unseen inner thoughts and processes. They also rely on objective scientific evidence and tend to dismiss internal cognitive experiences. John Watson (1913), the first person to use the term *behaviorism*, focused
on behavior as an expression of intelligence and noted that behavior varied with experience. He believed that behavior was determined by both genetics and the environment; it could be predicted and controlled.

Thorndike (1913) emphasized the neural bond that occurs between a stimulus and a response. He believed that learning occurred in increments through trial and error rather than after an insightful *aha* moment. Further, he claimed that learning resulted directly from experience without any awareness on the part of the learner. However, he acknowledged that learners have dispositions based on several factors (e.g., genetics, culture, and survival needs) that affect their response to a stimulus.

According to Hergenhahn and Olson (2005), before the 1930s Thorndike identified three main laws of learning, which include the law of exercise, the law of effect, and the law of readiness. The law of exercise emphasized the importance of using or practicing behaviors in response to an environmental stimulus or demand. This law would support the hypothesis that the nontraditional PT students involved in my research would develop stronger clinical skills (learned responses) because they practiced various PT skills not only as PTAs before and during the coursework phase their program, but also as students with full-time clinical affiliations for a 24-week period. In contrast, the traditional PT students have more sporadic clinical experiences between which they may experience losses of learning, according to the law of exercise. However, it should be noted that Thorndike later renounced this law of exercise, stating that mere practice may only slightly strengthen a response and that lack of practice may lead to only slight forgetfulness (Hergenhahn & Olson, 2005).

Thorndike’s law of effect addressed the concepts of reinforcement and punishment used to influence the stimulus-response connection. He subsequently revised this law, explaining that
“reinforcement leads to the strengthening of the connection, whereas punishment does nothing to strengthen the connection” (cited in Hergenhahn & Olson, 2005, p. 68). He emphasized the importance of personal rewards. In other words, the greater the degree of satisfaction following a given response, the more likely that response will reoccur. To Thorndike, the idea of personal rewards was unique to the individual person. He explained that a given object, event, or condition may be perceived as a reward by one person, but not another. Consequently it would be difficult to use the law of effect to predict the outcomes of the study summarized in this dissertation.

Thorndike’s law of readiness referred to the chaining of a series of responses for the accomplishment of a goal. He claimed that the blockage or non-occurrence of any of the chained responses would result in a sense of dissatisfaction due to the inability to accomplish one’s goals. This law indicated that learning may depend upon the transfer of specific information from past experiences to new learning situations. Since the nontraditional student group involved in my study has been practicing in the PT environment, they may have an advantage over the traditional group due to the likelihood of having developed complex skills based on a series of chained stimulus-response connections concerning physical therapy.

Pavlov (1927) further described the stimulus-response model as a pairing of an unconditioned stimulus (e.g., food) with an originally-neutral stimulus (e.g., bell ringing) that results in unconditioned response (e.g., salivation). Over time, the neutral stimulus is conditioned to elicit the conditioned response (i.e., salivation occurs when the bell rings even without the presentation of food).

Like Thorndike and Pavlov, Skinner (1938, 1958) supported the importance of the stimulus-response connection in emphasizing that previous learner experiences result in learned
responses. He took his theory to an extreme by minimizing the importance of the inner physiological processes, indicating that only behavior that is observed by another organism is important as a learning outcome. Furthermore, he identified two types of observable behavior: (a) respondent behavior, a response that is “elicited by a known stimulus” and (b) operant behavior, a response that is “not elicited by a known stimulus, but is simply emitted by the organism” (Hergenhahn & Olson, 2005, p. 79).

Skinner believed that learners’ responses are a function of what is occurring within the given environment (Skinner, 1938, 1958). He reported that both the antecedents of behavior and the reinforcements following behavior could make an impact on subsequent behavior (i.e., learner response). In addition, he explained that such behavior could be affected by other variables such as the learners’ emotional states, drug use, amount of sleep, metabolic or pathological states, and age. Even though he maintained that there was no need to consider any internal mechanism involved in the learning process, he did acknowledge that the context of the situation could affect learning.

On the whole, the behaviorist theories described in this section would predict better clinical performance on the part of nontraditional students, compared to that of traditional students involved in this dissertation research. Because of their work experience in PT settings both before and during the MPT program, the nontraditional PT students may have formulated many of the stimulus-response connections required for effective practice as PTs. In many cases, professional skills that have been practiced repetitively in the work environment may have become more automatic in the sense that learners are not conscientiously aware of the series of steps they take in responding to the needs of clients or other factors in the external environment. Such automatic responses are desirable, especially when they reflect basic and yet critically
important skills such as safe practice, communication, or treatment. It is assumed that, although each clinical site provided a context that was uniquely different from all others, the primary elements of the clinical environment, on the average, did not differ substantially for the two groups of students involved in this study. With the exception that the nontraditional students were older and had prior work experience as PTAs, the extent to which the two groups are similar or different in terms of emotional states, sleeping patterns, or other ways suggested by Skinner are not known. Thus, it was difficult to offer a priori hypotheses regarding differences in the clinical performance of the two groups of MPT students.

Hull’s Theory: A Transition to Cognitivism

All of the aforementioned behaviorists acknowledged the role of experience in conjunction with the stimulus-response connection but emphasized the observable response. Hull (1943) accepted the stimulus-response model, but introduced the concept of internal mechanisms that he termed intervening variables, such as drives and cues. He reported that a stimulus may initiate the learning process, but this process also included the following four elements:

1. Drive: learners must want something,

2. Cue: learners must attend to something,

3. Response: learners must do something, and

4. Reinforcement: outcome must be desired by learners. (Hergenhahn & Olson, 2005)

Hull (1943) explored the ways in which these internal mechanisms affected the learners’ responses and developed sixteen behavior postulates. These postulates dealt specifically with the internal mechanisms involved in the learning process. Essentially Hull emphasized the importance of controlling the stimulus-response connection through not only antecedent stimulus and reinforcers in the environment, but also drives, cues, and other internal processes within the
individual. Thus, Hull’s theory could be considered a transition to the information processing theory or cognitivism.

It may be that the nontraditional students in the current study have a greater drive to gain PT knowledge and skills because they already have experience in this field. First, they understand how helpful effective PT treatment can be and how harmful inappropriate treatment can be for their clients. Second, their past work experience could also give them additional cues to attend to certain aspects of the learning process. For example, they have worked with clients who have various PT problems such as muscle tone. When a classroom or clinical instructor discusses muscle tone, they may be more likely than traditional students to attend to this topic because they have not only read about this PT problem, but also had physical experience seeing and feeling how muscle tone changes under certain conditions.

**Information Processing: The Importance of the Unseen**

In contrast to the behaviorist, the cognitive theorist focuses on the construction of mental maps or *schemas* internally within the learner. This internal process is not observed, but is inferred as the basis of new learning. Instructors can influence the internal process by manipulating life experiences that occur before and after the internal activity. Many cognitive theorists have documented the importance of internal information processing (Argyris, 1982, 1995; Dewey, 1933; Knowles, Holton, & Swanson, 2005; Lewin, 1951; Miller, 1956; Piaget, 1970; Schön, 1987; Senge, Kleiner, Roberts, Ross, & Smith, 1994).

Dewey (1933) was one of the first philosophers to provide a learning theory that emphasized internal mechanisms. He reported that there needs to be active manipulation of the environment for learning to occur. According to Dewey, instructors can promote learning through the (a) introduction of a problematic situation, (b) identification of the parameters of the
problem, (c) generation of possible solutions to the problem, and (d) assessment of the adequacy of solutions. Once the chosen solution is found to be successful, it becomes a part of the learner’s response repertoire. Therefore, learning has occurred.

This problem-oriented approach to learning is definitely utilized in PT and other clinical environments related to medicine. In fact, Roschelle (1999, p.234) reported that medicine “best exemplifies the interplay of disciplined reasoning and timely decision making that Dewey sought to extend.” Both groups of PT students involved in my study had been exposed to this problem-solving approach to learning during their clinical affiliations. However, the nontraditional students had a greater number of these active learning experiences because they continued to work full-time as PTAs throughout the coursework phase of their academic program. Thus, they had opportunities to apply their formal academic learning directly to real life clinical situations on an ongoing basis.

Miller (1956) formulated an information processing theory that focused on two major concepts: (a) the human brain encodes, retains, and retrieves information, and (b) there is a limit as to how much information can be memorized over a period of time. He reinforced the fact that learning occurs internally and is based on learners’ individual experiences and abilities to code, retain, and retrieve information. Further, he recommended six guidelines for educators to utilize in promoting a favorable learning outcome. The third guideline dealt most specifically with the learners’ experiences connecting previously learned information to new information. Miller believed that it was important for instructors to help learners make these connections, but emphasized that only learners can verbalize what they already know and must reflect upon their past experiences in relation to new learning situations.
Since the nontraditional students in my study had devoted more time to working with PTs in clinical settings, they may have had an advantage over the traditional students because they had already developed many internal connections that would assist them in coursework related to the roles and skills of physical therapists, especially clinicians. In contrast, they may have had more difficulty than traditional students in foundational science courses because their science knowledge may have become outdated during the years that have passed since they completed their undergraduate programs.

Piaget (1970) also focused his work on the cognitive development of learners. He produced a theory that was based on initial observations of his own children and subsequent case studies of other children. He reported that infants are born with innate reflexes that assist in the development of sensory-motor functions, which in turn foster the growth of cognitive operations. According to Piaget, the early sensory-motor functions cultivate symbolic processes that can assist learners with manipulating and testing the environment. He claimed that developing learners employ two basic functions:

1. **Assimilation**, which is the process of fitting environmental events into existing cognitive structures (called schemas), and

2. **Accommodation**, which is the process of developing a new category or schema for classifying an environmental event that does not fit existing schema.

Finally, he argued that actual interaction between individuals and environments must occur in order for learning to take place. Whether by assimilation or accommodation, cognitive activities would lead to new learning. This learning, unique to the learners’ experiences, forms the foundation for future learning.
Clinical affiliations associated with the PT program at The University of Findlay facilitated *real life* interactions for both traditional and nontraditional students. The extent to which students benefited from these opportunities was undoubtedly unique to the individual student and the learning environment. Although the amount of time devoted to formal clinical education was similar for the two groups, the nontraditional PT students had a greater amount of related experience in PT clinical environments as a result of their full-time employment as PTAs while completing their PT coursework. Such experience may have helped them in creating and refining schemas that gave them an advantage in assimilating and accommodating new information presented in their PT programs.

Argyris and Schön developed several cognitive learning models that emphasized the importance of experience to the learning process (Argyris, 1982). For example, they proposed that learners have *mental maps* that influence how they plan, behave, and assess their actions. These mental maps develop “early in life through socialization” (p. 84). They contended that most people are not aware of their own mental maps and that if these people recognized and reflected on their mental maps, then more effective learning could occur.

Argyris and Schön categorized learning as, *single loop* or *double loop*, which Argyris (1982) associated with the following situations:

1. **Single loop learning** (a) occurs when learning fits past experience and present knowledge, (b) involves automatic responses that usually occur quickly and without much conscious attention, and (c) is less risky to learners because their current understanding supports the new learning. This type of learning is very similar to Piaget’s *assimilation*.  


2. *Double loop learning* (a) occurs when learning is not supported by past experiences and may contradict present knowledge, (b) requires a change of schema and thus requires more time and conscious effort, and (c) is more creative and reflective than single loop learning. Piaget’s definition of *accommodation*, as discussed in the previous section, is comparable to descriptions of double loop learning.

According to Argyris (1982), *Models I and II* developed by Argyris and Schön consisted of three basic elements: (a) governing variables, (b) action strategies, and (c) consequences (i.e., intended or unintended result of an action). Learners are programmed to respond according to their own governing values, which affect their action strategies (Argyris, 1995). Learners may claim to have certain sets of beliefs, attitudes, and values and yet in actuality may choose to behave according to the values and expectations of society or segments thereof (e.g., family, school, peer group). The action strategies are the plans used by learners to keep governing variables within an acceptable range and are based upon the consequences of the action. The consequences may affect the learners, others associated with the learning events, and/or the environments. Thus, an intended outcome such as effective learning is dependent upon both the governing values of the learners and the action strategies used by learners.

*Model I Theory-In-Use* utilizes *single loop learning*. Argyris (1982, p.86) listed the governing variables to be: (a) achievement of own purpose, (b) accomplishment of winning, (c) suppression of negative feelings, and (d) emphasis of rationality. As explained by Argyris (1982), these variables may lead to action strategies such as:

1. Design and management of the environment with control over relevant factors,

2. Control of own tasks,

3. Self protection through unilateral control, and
4. Protection of others through unilateral control.

Unfortunately, these types of action strategies tend to make others defensive because the control is one-sided. Others also tend to see learners who are in complete control of the learning experience as having defensive attitudes. These attitudes could lead to “low freedom of choice, internal commitment, and risk taking” (Argyris, 1982, p. 87). Learning may therefore be limited to what previously existed within or was provided by the learner, whether it was correct or not. Consequently, only “learning within the confines of his or her theory in use” (p. 88) can occur for those involved in single loop learning.

*Model II Theory-In-Use* allows for *double loop learning*. Argyris (1982, p.101) identified the governing variables as: (a) achievement of valid information, (b) utilization of free and informed choice, and (c) internal commitment to choice with ongoing monitoring of the process. These governing variables reject unilateral control and emphasize that, in order to learn most effectively, learners should consider information and opinions offered by others. According to Argyris (1982), they are also collaborative in nature and would lead to the following chosen action strategies:

1. Promotion of personal involvement,
2. Encouragement of task collaboration,
3. Protection of self that is oriented towards the cause of the group, and

A collaborative attitude could lead to “high freedom of choice, internal commitment, and risk taking” (Argyris, 1982, p.102), yielding more effective double loop learning. These governing variables and action strategies foster new learning that is not restricted by previous
learning. In addition, double loop learning fosters continued scrutiny of both the meaning of newly created concepts and the processes that were used to create them.

The two cognitivists, Argyris and Schön (Argyris, 1982) concluded that, in order to learn effectively, learners must be aware of their own governing variables and be honest about their behaviors or action strategies. Further, they need “to continually reflect on the experiences” and understand “the reasoning behind their thoughts and actions” (pp. 259-260).

Besides Schön’s collaboration with Argyris on the Theory-In-Use models, he wrote in more detail about the concepts knowing in action and reflection in action (Schön, 1987). Specifically he defined knowing in action as the knowledge that is revealed “by our spontaneous, skillful execution of the performance; and we are characteristically unable to make it verbally explicit” (p. 25). This knowledge is based on existing schema and involves an automatic response obtained without knowing exactly what led to that response. Schön claimed that learners may be able to describe their resulting knowledge, but that these descriptions reflect only simple constructions or static conjectures (e.g., facts, procedures, rules).

Reflection in action is based on self discovery of inappropriate, inadequate, or missing schema (Schön, 1987). When learners discover something that is unexpected, they can choose to (a) ignore the existence of any conflict, (b) brush it aside and maintain existing schema, or (c) reflect upon the conflict of thought (Schön, 1987, p. 26). All of these choices are made consciously after a period of reflection. According to Schön, this reflection may take the form of reflect on action, which occurs after the present action or reflect in action, which occurs simultaneously with the action.

Reflect on action, which may occur briefly during a paused moment or more extensively as time and circumstances allow, yields consideration of the bigger picture concerning the
learners’ behavior and all of the variables involved with that behavior. In contrast, *reflect in action* involves instant experimentation designed to make immediate changes in our behavior. The consequences of such changes may be what is desired or may lead to further reflection and experimentation. Schön (1987, p. 39) reported that reflection is especially important with “uncertain, unique, or conflicted situations of practice,” and he encouraged its conscious use, particularly in reference to experience, in an effort to obtain favorable learning outcomes.

It was assumed that the two groups of students involved in my dissertation research had, on the average, equal abilities to reflect. In addition, they presumably had similar opportunities to engage in what Schön (1987) referred to as *reflect in action* and *reflect on action* while completing their clinical affiliations. However, the PTA to MPT program generally promoted the conscious use of experience within the curriculum. For example, instructors often asked nontraditional students about the treatment and recovery of their clients. They also assigned projects that involved interactions with supervisors and clients within their place of employment. In contrast, traditional students had only experiences associated with brief clinical affiliations interspersed throughout their PT program that they could reflect on and relate to the content covered in their PT courses.

Senge, Kleiner, Roberts, Ross, and Smith (1994) explored how students can improve their learning outcomes. Their theory, based on the works of Argyris and Schön (Schön, 1987), identified *mental models* as “images, assumptions, and stories which we carry in our minds of ourselves, other people, institutions, and every aspect of the world” (p. 238). They reported that two learners may observe the same occurrence and yet perceive the incident differently because they attended to different details surrounding the experience on an unconscious level. Therefore,
their mental models are unique to their own individual past experiences, observations, and perceptions.

Senge et al. (1994, p. 241) developed “the ladder of inference” to visually explain how mental models affect learners’ beliefs. The learners’ beliefs, in turn, determine the data that they select and that eventually affects resulting behaviors. Learners are usually unaware of these mental models and how they shape their behavior. In addition, they often resist changing their beliefs that do not fit their mental model. Unfortunately, this resistance could result in a roadblock to exploring other possibilities; therefore, ineffective or no learning may take place.

According to Senge et al. (1994), all individuals have the capacity to learn. However, learners need to be aware of their mental models and think critically about their past and present experiences with minimal defensiveness. The process of becoming aware of mental models was defined by Senge and his colleagues (1994) as reflection. In addition to reflection, they encouraged learners to share their opinions about their own assumptions. The verbalizations concerning their own assumptions could lead to a greater understanding of those assumptions and provide them with additional data that could affect their resulting behaviors. This collaborative process was known as inquiry. Senge and his colleagues believed that the process of reflection and inquiry needed to be ongoing in order for favorable learning outcomes to occur.

As was previously mentioned, it was assumed that the two groups of students involved in my study had equal abilities to reflect. And yet, the two groups differed in the amount and type of past experiences upon which they could reflect. Upon entering the PT program, nontraditional students had at least one year of experience in the PT setting, whereas traditional students may have had minimal volunteer experience or no experience whatsoever in the clinical setting. The extent of past experience with physical therapy may have helped nontraditional students develop
their awareness of mental models associated with PT. Another advantage for the nontraditional students may be their ongoing interactions with their colleagues in the clinical setting during the coursework portion of the PT program. Traditional students may not have similar opportunities to share with practitioners their opinions about their own assumptions. Their collaboration with classmates and teachers would not allow the same degree of inquiry that nontraditional students’ experience.

However, past experience may have affected the nontraditional students in a negative way if the depth of personal commitment to their mental models made them more resistant to change. This resistance could ultimately have led to roadblocks to their learning. In contrast, traditional students may have had less personal commitment to mental models concerning PT because they simply did not have experience in the clinical setting. They, therefore, may have more easily accepted new mental models and adapted to new learning situations.

Knowles, Holton, and Swanson (2005) emphasized that learners need to keep current with their knowledge base through ongoing activation of the learning process. They believed that lifelong learning is especially needed with our ever-changing world. Further, learners need to become aware of the “unlearning process” (Knowles, Holton, & Swanson, 2005, p. 194) that may occur when their mental maps or schemas are challenged. This unlearning process presumes that learners are open to new ideas that do not fit their previously formed mental models.

Even though nontraditional students may have experienced roadblocks or difficulties with the unlearning process, they may have developed an awareness of the need for lifelong learning due to the constant changes to the PT professional knowledge base. Their need to stay current may have been fostered by their experiences as PTAs both before and during their PT program.
During these real life clinical experiences these students may have increased their understanding of the importance of being up-to-date.

Lewin (1951) also discussed the idea of the unlearning process, terming it the unfreezing stage of learning. He described unfreezing as the first of three stages of learning. During this stage learners disconfirm their former values and belief systems. During the second and third phases, change and refreezing, learners must be aware of their attitudes and beliefs and must be open to change. There is a building effect from unfreezing to refreezing that is based on the learners’ schemas that are challenged by new experiences. Lewin stressed that faulty attitudes and beliefs, if left unchallenged, could result in negative outcomes.

It was the intent of the PT program and its faculty to challenge the faulty attitudes and beliefs of all students so that more effective learning could occur. In particular, they challenged nontraditional students by providing the latest information and encouraging the application of new learning to the clinical experiences. Although the coursework was essentially the same for the two groups of students, the nontraditional students may have had roadblocks to their learning because of their strong investments in knowledge and skills they had developed during their PTA programs and their careers as PTAs.

Behaviorists and cognitive theorists agreed that past experience does make a difference in the learning process. However, cognitivists focused on the learners’ internal construction of schemas, mental models, or maps; further, they described stages that were dependent on whether the new information or situation was congruent with the previously learned knowledge. Like behaviorists, the cognitivists looked for ways to influence the internal process by manipulating experiences before and after the learning activity. And yet, unlike the behaviorists, they stressed that there are internal variables (e.g., attitudes and beliefs) over which they do not have full
control. They recommended that instructors make effort to affect these internal variables by encouraging learners to be aware of their mental models; open to change, if needed; and committed to staying current with their knowledge base.

*Transformational Learning: Active Involvement of the Learner*

With behaviorism and cognitivism, respectively, instructors are presumed to have all or some control over the learning experience. However, strong instructor control often yields passive and rather superficial learning. In addition controlling instructors have a tendency to focus on simpler cognitive, affective, and psychomotor tasks. Hence, many theorists have looked for alternative models of learning that involve learners, their environments, and other variables, so as to result in more complex ways of thinking, more mature approaches to learning, and higher levels of learning and performance outcomes.

In response to this need, constructivists have developed an educational philosophy that promotes a greater degree of control by learners throughout the entire learning experience (Adal-Haqq, 1998; Wilson, Teslow, & Osman-Jouchoux, 1995). Constructivism links the learners’ perceived past experiences with their involvement in new occurrences and the learning that results. Abdal-Haqq (1998, p. 2) reported that, according to constructivism, “individuals create or construct their own understandings or knowledge through the interaction of what they already know and believe and the ideas, events, and activities with which they come in contact.”

Learners participate in the construction of their learning experience from the beginning to the end. For example, learners are expected to set their own goals, choose the methods of instruction that is most effective for their learning style, and determine the best means of assessing the accomplishment of their goals. Hence, constructivism requires that learners not only have good reflection skills, awareness of their mental models, openness to change, and
commitment to lifelong learning, but also are self-directed throughout the entire learning experience.

Constructivist instructors take on roles as facilitators, supporters, and providers of resources for their students. Some learning activities that could be encouraged by the instructors are: (a) active engagement and questioning, (b) inquiry and discovery, (c) problem solving and critical thinking, (d) collaboration with others, (e) hands-on activities, and (f) field-based opportunities for experiential learning. Constructivists have reported that the use of these activities can lead to greater internalization, understanding, and application of new information (Adal-Haqq, 1998; Wilson, Teslow, & Osman-Jouchoux, 1995).

Abdal-Haqq (1998) stated that there are two main types of constructivism: psychological and social. Psychological constructivism emerged from Piaget’s works, which promoted the development of learners’ interests and talents. It is a learner-centered approach whereby individuals come to the classroom with their own ideas, beliefs, and attitudes that may be modified by the new learning experience. During this experience a dilemma is created for learners, and new learning occurs while they work through the conflict. The focus is on the internal development of learners, but with the emphasis on the accomplishment of the goals of the learners themselves, as opposed to their instructors. The major criticism of psychological constructivism is its lack of attention to the goals of the instructors and fellow classmates, classroom culture, and the broader environment with which learners come in contact.

Abdal-Haqq (1998) also discussed social constructivism, which involves the influences of the immediate environment (e.g., classroom) and broader background (e.g., culture, history). Internal development occurs, but it results from interactions between learners and their
environments. Not only is there a transformation of learners caused by these interactions, but the changed learners also influence their environments.

Mezirow (1991, 2000) and Freire (1970) agreed that learners need to construct their own learning experiences for the best learning outcomes to occur. However, they specified that there need not be a transformation of the environment with every learning situation. Mezirow (1991) explained that learning may occur by simply adding to the existent frames of reference, acquiring new frames of reference, transforming specific points of view (i.e., *schemes*), or transforming broad habits of mind (i.e., *perspectives*).

In order for learning to be considered transformational, at a minimum, learners must be changed in some major way, and this alteration must be evident to both the individual learner and others associated with that learner. Mezirow (2000, p. 8) reported that the goal of transformational learning is “to gain greater control over our lives as socially responsible, clear thinking decision makers.” Thus, the ultimate goal of the constructivists is for learners to become autonomous, rational thinkers who are sensitive and responsive to the needs of society.

Mezirow (2000, p. 5) further explained that this goal may be reached through, “using a prior interpretation to construe a new or revised interpretation of the meaning of one’s experience in order to guide future action.” Two aspects of meaning that could be transformed for learners are *meaning schemes* and *meaning perspectives*. *Meaning schemes* are “specific beliefs, feelings, attitudes, and value judgments” or “individual points of view” and *meaning perspectives* are “broad, generalized, orienting predispositions” or “habits of mind” (Mezirow, 2000, p.5). A change could take place with a specific scheme, group of schemes, or entire set of perspectives. According to Mezirow, the degree of awareness of the learners’ points of view and habits of mind has a strong influence on learning outcomes.
Not only does transformational learning require a level of awareness of internal mechanisms, it needs other preconditions in order for substantial changes to take place. According to Mezirow (2000, p.15), these preconditions included “maturity, education, safety, health, economic security, and emotional intelligence.” In addition, he hypothesized that learning may be affected by the environmental context of the situation (i.e., the biographical, historical, and cultural factors). The extent to which the two groups of students involved in my study were equally affected by these variables (i.e., preconditions and environmental contexts) is not known. However, the concept of maturity as a precondition to learning may be linked to age and different types of life experiences. As a group, the nontraditional students in my study were significantly older and had a greater variety of life experiences (in particular, relevant work experiences) that may have influenced their clinical performance.

Merriam (2004) also suggested the need for a prerequisite level of cognitive maturity in order to engage in transformational learning. She emphasized that learners must develop reflective thinking about their own assumptions and the opinions of others. In addition, they must be open to *rational-reflective discourse*, in which they set aside their biases, prejudices, and personal concerns and consider alternative perspectives in a rational manner.

Merriam and Caffarella further explained that critical thinking comes with maturity (Merriam, 2004; Merriam & Caffarella, 1999). Thus, nontraditional students may have a greater chance of being reflective thinkers who are able to consider alternatives in a rational manner because they have lived longer and had a greater variety of life and work experiences upon which they can reflect. In contrast, traditional students may not have had enough time or experience to develop critical thinking skills.
In summary, experience is the basis of transformational learning. All learners have a need to make sense of their experiences. Typically a conflict, dilemma, or challenge starts the learning process by making learners aware of their discontent and the need to self-examine their assumptions. Learners next explore options for new understanding or perspectives (psychological constructivism), or new roles, relationships, or actions based on an active, open dialogue between parties (social constructivism). There is a phase of developing a plan of action and, if necessary, phases of trying new roles and building competence and self-confidence. The final step is integrating the transformed perspective in their lives.

This transformational learning process generally results in an internal or behavioral change that may range from a simple changed belief to a full-fledged social action. All PT students go through transformations during their clinical affiliations. For example, changes in their clinical performance are very apparent from the beginning to the end of the affiliations. Did transformations involving the knowledge, skills, and attitudes of PT students in the clinical setting differ for the two groups of students involved in my study? It is very difficult to know because the two groups entered the clinical setting of the PT program with presumably different sets of knowledge, skills, and attitudes. However, it seems reasonable to hypothesize that because of their more extensive life and work experiences, the nontraditional students had more to reflect on and transform as a result of their clinical experiences.

Factors that Promote Learning

The theorists cited throughout this chapter unanimously agreed that past experience does have an effect on learning. However, each focused on a certain aspect of the learning process. For example, behaviorists emphasized the external stimuli and the learners’ responses, cognitivists highlighted internal mechanisms such as learners’ awareness of their mental maps
and openness to change, and constructivists stressed the learners’ ability to construct their entire learning experience with a resulting transformation or observed change. Whether learning outcomes are favorable or not is dependent upon a number of factors that vary according to different theorists.

Attention to the Stimulus, Response, and Feedback

Behaviorists have suggested that immediate or repeated attention to stimuli can be of benefit to the learner. First, the learning experience needs to be well planned by instructors. Behaviorist instructors take full responsibility for determining the best content and methods of instruction for their students. An appropriate stimulus, as determined by the instructor, is given to the learners prior to the desired response (Pavlov, 1927). Some recommendations for a controlled experience include: (a) use of behavioral objectives, as determined by the instructors, (b) teaching progression from simple to more complex activities, (c) choice of teaching methods and strategies, and (d) use of testing tools that assess the chosen learning objectives.

Once the desired response has occurred, there should be ongoing practice and reinforcement of this activity (Thorndike, 1913). Thorndike suggested using feedback such as verbal praises, material rewards, and positive facial expressions in support of the learning process and the desired behaviors that result. Most behaviorists also believe that such feedback should be given immediately and repeatedly in support of favorable responses to the learning stimuli (Pavlov, 1927). For example, multiple quizzes or assignments with immediate feedback would have an advantage over one or two major examinations. Depending on the learners’ past experience and history of abilities, instructors should allow the learners to progress at their own pace (Skinner, 1958). Hence, learners with previous experience and abilities in the area being
studied should be allowed to progress faster than those who do not. In addition, they should be encouraged to achieve a higher level of learning.

*Consideration of Intervening Variables*

Hull (1943) would agree with the recommendations provided by the behaviorists, but he also promoted the consideration of intervening variables such as drives and cues. These variables may influence both the process and outcome of the learning experience. He believed that the more similar past experiences are to the current learning demands, then the less need there will be for the instructor to attend to the learners’ internal mechanisms. For example, there would be less need for providing cues to, or fostering the motivational drives of, learners who have a greater degree of experience with the topic of concern. Thus, Hull (1943) would recommend that instructors use strategies to motivate and cue learners as needed according to their past experiences, as well as their current states.

*Awareness of Internal Mechanisms*

Unlike behaviorists who emphasized external stimulation, cognitivists have stressed the internal thought process of learners as the primary factor that promotes learning. The key to a favorable outcome is for learners to become aware of their mental maps or schemes, which were formulated from their past experiences. Dewey (1933) believed that educators should foster this awareness through the formulation of a dilemma that is posed to learners. Once learners become aware of a dilemma, they should be encouraged to identify the problems, determine alternative solutions, and assess the adequacy of the solutions.

In order to initiate the learning process, there first needs to be an identification of the learners’ knowledge and abilities, the learners’ needs for accomplishing their learning goals, and the resulting dilemma of the learning experience (Argyris, 1982; Schön, 1987). These variables
could be identified formally through pre-testing or informally through the instructors’ observations and conversations. After obtaining a clear understanding of the learners’ status, instructors need to make a connection between what learners already know and the new material they plan to present (Miller, 1956). There are a number of strategies, such as classroom discussions and demonstrations, which could be implemented to facilitate this connection. Next, instructors need to encourage learners to reflect upon their learning both during and following the learning experience (Senge, Kleiner, Roberts, Ross, & Smith, 1994). The cognitivists believe that it is through the process of critical inquiry that learning is facilitated in greater depth and with increased efficiency.

**Reflection and Discovery**

Behaviorists and cognitivists generally limit intended learning outcomes to knowledge that currently exists and that instructors deem as important. However, transformational learning, which stresses learners’ abilities to construct the whole learning experience (Mezirow, 1991, 2000) and indeed to create knowledge itself, does not have this limitation. Through this approach learners embrace the application of past experiences throughout the entire learning process, enabling unlimited and meaningful learning to take place.

Constructivist instructors take the position of being facilitators and providers of resources for learners to construct and make meaning of their own learning experience (Mezirow, 1991, 2000). As facilitators, instructors allow learners to develop their own objectives, plans of action, learning methods and strategies, and assessment procedures. The process requires learners to have a certain level of maturity and to be self-directed, independent thinkers. Because many learners do not meet these requirements, instructors often work collaboratively with them as they learn to design, implement, and evaluate their learning experiences. According to constructivists,
this approach promotes a greater depth and breadth of learning, the creation of new knowledge, and an understanding of the meaning and application of knowledge through the processes of exploration, discovery, and reflection.

In summary, behaviorists, cognitivists, and constructivists all support the idea that past experience does have an effect on learning processes and outcomes. The extent to which the outcomes are favorable is dependent upon a number of factors including: (a) presentation of and attention to learning stimuli, (b) consideration of intervening variables, such as cues and drives, (c) awareness of internal mechanisms that affect learning, and (d) personal reflection and discovery of knowledge. It may be that a combination of the learners’ past experiences and their readiness to be self-directed gives an advantage to adult learners, who have more work and life experiences than do traditional students, in accomplishing their learning goals. However, this advantage may not yield successful learning if instructors are not familiar with adult learners and the many factors that affect their learning experiences. The following sections of this chapter provide an introduction to adult learners, their needs and abilities, and the application of their life and work experiences to their learning.

Who are Adult Learners?

There are a multitude of definitions and descriptions of adult learners (Bean & Metzner, 1985; Jarvis, 1987; Johnson, 2002; Knowles, 1984; Knowles, Holton, & Swanson, 1998; Mancuso, 2001). Mancuso (2001, p. 165) defined adults as the following:

Persons who have assumed major life responsibilities and commitments such as work, family, and community activities who are no longer dependent upon their parents or guardians, who operate independently in society, and whose principal identities have moved beyond the role of full-time student.
The common theme portrayed in the higher education literature is that adult learners are older, have more life experiences, and have multiple life roles and responsibilities. For example, they may be an employee, spouse, and/or parent. What is most obvious about adult learners is that they are older than the traditional 18-year-old students who enter college immediately following graduation from high school and begin graduate or professional programs immediately after completing their undergraduate degree. The National Center for Education Statistics (NCES) reported significant increases in the numbers of adult learners. For example in 2004, 59.3% of the students who entered professional programs and 82.5% of the students who entered graduate programs were 25 years and over (NCES, 2005).

The second most distinct characteristic is that adult learners have very diverse life experiences. These experiences are influenced by a multitude of factors such as educational background, socioeconomic status, family history, gender, age, current life-situation, motivational level, and occupational profile. Schuetze and Slowey (2002) reported that these variables could be consolidated into three groups including biographical stages (e.g., family background), entry routes into higher education (e.g., time of enrollment), and modes of study (e.g., part-time or web-based programs).

The background of adult learners may be a major influence on the other two categories, entry route and mode of study. The initiation into higher education may reflect a typical or alternative entry (Schuetze & Slowey, 2002). A typical entry may occur after the completion of secondary school and with an entrance exam. An alternative entry could occur after a number of years of marriage, parenthood, and work experience; require completion of a high school equivalency exam; or involve a special admissions procedure that does not include standardized testing. Some adult learners may have had a typical entry to college, left college for a wide
variety of reasons, and several years later had an alternative reentry in order to complete their degrees.

Student background may also impact the mode of study. For example, financial constraints, the need to work and raise a family, and the distance between home and campus may require nontraditional modes such as part-time study, evening and weekend programs, accelerated learning coursework, or web-based distance learning programs. The preferred modes of study have been as diverse as this population of adult learners. Adult learners have uniquely different situations that affect their choices regarding college enrollments and experiences. All three categories of factors identified by Schuetze and Slowey (2002) certainly may affect the overall learning processes and outcomes experienced by these nontraditional students.

The Organization for Economic Cooperation and Development (OECD, 1987) categorized adult learners into four types:

1. Adults who have had a break in formal education and then entered or reentered,
2. Adults over age 25 years,
3. Adults who entered higher education due to life experience, and
4. Adults who entered to pursue a second area of expertise or for professional updating.

For the purposes of this study, the term nontraditional PT students was defined to include individuals over the age of 25 who returned to higher education to pursue Masters in Physical Therapy (MPT) degrees after having worked for one year or more as physical therapy assistants (PTAs). Hence, the study’s definition complied with the first, second, and fourth type of adult learner as defined by the OECD (1987). Although the nontraditional students may be older and have more numerous and diverse life experiences than the traditional students involved in this
study, the most pertinent characteristic that distinguishes these two groups is that the nontraditional students had professional experience as PTAs.

The Abilities and Needs of Adult Learners

Caffarella and Barnett (1992) contended that adult learners enter higher education “with a broader knowledge and experience base than the more traditional students right out of high school, and therefore often have rich and varied perspectives from which to draw from when completing their studies” (p. 17). They suggested that adult learners are unique in three ways. First, adult learners assume not only the roles of students, but also many other roles as parents, spouses, and employees. Therefore, instructors need to consider these multiple roles and responsibilities when developing learning experiences for the adult learners.

Second, there needs to be an appreciation of past experiences, which plays a strong role in the learning process of adults. Work and other life-related experiences of adult learners should be used as resources conducive to the learning experience. The need to make sense out of previous and current experiences is often a strong motivator for learning. The key to taking advantage of student experiences is to encourage reflection and discussion of the links between such experiences and new information, insight, or skill resulting from the learning experience. As Argyris (1982) noted, learners need to break apart their thoughts and actions and examine the reasoning that supports all of their choices.

The third unique characteristic of adult learners, particularly in comparison to traditional aged college students, is that they commonly utilize previously acquired knowledge as building blocks for new understanding. The connection of the existing knowledge with new learning experiences is accomplished through either a hierarchical or a networking manner (Graham, Donaldson, Kasworm, & Dirkx, 2000). The hierarchical type of connection refers to a building
of simple pieces of information towards the more complex. For example, PT students may first learn the basic parts of a wheelchair. Later students may apply that knowledge when selecting an appropriate wheelchair for an assigned client. Thus, there is an upward building effect with the hierarchical type of connections. The networking type of connection also supports the existing knowledge base, but extends that knowledge to new and different contexts. For example, PT students may have already learned how to prescribe a wheelchair for adults with neurological conditions. They may next utilize this preexisting knowledge to apply it to pediatric clients who have similar neuromuscular problems.

The degree of successful learning depends upon the accuracy of the preexisting knowledge and the appropriateness of applying that knowledge to another situation. Hence, it is quite important that learners are aware of this transformation process and are constantly assessing their new perspectives. Caffarella and Barnett (1992) agreed that the hallmarks of adult learning involve not only the vast accumulation of knowledge and experience, but also self-awareness of the transformation process.

Kolb’s (1984) work also suggested that adult learners, compared to traditional students, might approach the learning process in a different way. He described the learning process as a continuous transformation of experience with four stages or dimensions, including concrete experience, a feeling dimension; reflective observation, a watching dimension; abstract conceptualization, a thinking dimension; and active experimentation, a doing dimension (Kolb, 1981, 1984, 1985). Each stage can provide a foundation for other dimensions. Most typically, traditional students have chosen a learning dimension with which they are most comfortable. In contrast, adult learners have had more past experiences and are able to be flexible with how they initiate, maintain, or adapt the learning process.
According to Kolb (1981), gaining new knowledge and skills was central to individuals’ lives. He reported, “How one learns becomes a major determinant of the course of personal development” (p. 248). He listed three stages of learning, which are acquisition, specialization, and integration (Kolb, 1981, 1984, 1985). The basic processes of learning and cognitive structures are initially developed during the acquisition stage. As one matures from adolescence into early adulthood, socialization forces further promote the development of preferred learning styles. This phase is known as specialization. The greater the development of diverse learning styles, the more successful one can be in various learning situations. According to Kolb (1981), the integration phase occurs at mid-career. It is during the integration phase that learners express non-dominant learning styles in various situations. By being able to utilize all learning styles, adult learners can more effectively learn.

Integration of Past Experience

Because of the unique characteristics of adult learners, there needs to be an integration of past experiences with new information, which may be facilitated through experiential learning (Knowles, 1984). Cantor (1995) defined experiential learning as an immersion of learners in activities that have links with the academic material and the real-world experience. There are three major structural elements of effective experiential learning: (a) development of objectives and learning activities, (b) reflection on the learning experience, and (c) feedback on learning outcomes (Marlin-Bennett, 2002).

First, it is important to make clear what the expected outcomes are through the use of learning objectives. Ideally, all parties would work together to identify the objectives and learning activities. With experiential learning in an MPT program, the concerned parties would at least include students, their supervising clinical instructors, and academic faculty. Because the
adult learners have a wide array of past experiences, they would have the greatest amount of influence in designing their objectives and learning activities. The clinical instructors would know what resources are available to use in support of those learning activities. The program faculty would also guide the development of experiential learning to ensure that it is connected to the academic curriculum, includes reflection and feedback components, and meets minimum standards required for licensure.

Eyler and Giles (1999, p.8) emphasized that, “Experience enhances understanding; understanding leads to more effective action.” However, the vital link to understanding is the component of reflection. Reflection is especially important in a constantly changing society with a rapidly expanding knowledge (Sockett, 1996). Reflection should include personal observations, feelings regarding those observations, and an analysis of the whole experience. The periods of reflection could be documented in a journal or a logbook. Understanding may also be promoted through individual self-reflection activities, collective discussion, and feedback from others (Johnson, 2002).

Hutchings and Wutzdoeff (1988, p. 5) reported, “The integration of learning and knowledge is not simply a matter of application but rather an ongoing interactive process in which both knowledge and experience are repeatedly transformed.” In other words, reflection may occur either during the learning experience or at the end of that experience. The key to effective learning is not only the experience itself, but also the reflection process (Kolb, 1984).

The third structural element of experiential learning is feedback. Ongoing feedback and summative evaluations are essential for enriching the learning experience and bringing closure to the experience. The ongoing feedback could stimulate additional questions and promote further learning. The summative evaluations would give learners a benchmark as to how they are
performing at a specific point in time, such as the midpoint and end point of the experience. Feedback from all involved parties could provide learners with direction to fulfill their learning needs.

Marlin-Bennett (2002) reported that there are many benefits associated with experiential learning. He stated that the major advantage of learning in a clinical setting is the acquisition of professional competence. Cantor (1995) also listed numerous benefits of clinical experiences including active student participation, direct relevance to the covered topic, dynamic learning in the ever-changing real world, professional behavior development, financial gain, and potential job placement. Thus, through clinical experiences, learners may develop cognitive, affective, and psychomotor skills that specifically pertain to their own profession.

Clinical Performance: A Measure of Learning

The study summarized in this dissertation investigated the performance of two groups of MPT students assigned to traditional internships for their final clinical affiliations. The demonstrated behavior of PT students in a traditional internship completed in a clinical setting is most commonly referred to as clinical performance. Effective learning outcomes can be indicated by the quality of clinical performance as assessed by clinical instructors (CIs). Observation, supervision, and evaluation of clinical performance are among the primary duties of CIs. Thus, they need to be familiar with all relevant professional skills and take every precaution to ensure that their performance assessments are as accurate and as objective as possible.

Watts (1990) stressed that several principles of assessment should be taken into consideration when rating students’ clinical performance. The supervising instructors should rate students on the actual observations of behaviors that are typical and frequent at the time such ratings are recorded. Learning occurs over a period of time; therefore, the instructors need to
look for consistency in performance up to that point in time. There should not be an averaging of behaviors from the initial observation to the final point, but rather a reporting of the behaviors that are demonstrated at that final point in time.

Besides utilizing Watts’ (1990) principles of assessment, the supervising instructor should take into consideration possible rater errors that could occur when assessing clinical performance (APTA, 2000; DeMers, 1978). Guilford (1974) identified six common rating errors, including halo and reverse halo, leniency, central tendency, logical, proximity, and contrast errors. The halo and reverse-halo effects are the types of error whereby the rating of one item positively or negatively affect the rating of another item or group of items. Clinical instructors must be careful to rate each item on its own accord. For example, CIs may give all high scores to the first several skills (e.g., responsibility, ethical practice, legal practice) due to a positive impression with just one of those skills such as responsibility. This type of an error would be a halo effect.

Secondly, CIs need to be aware of their relationship with PT students. Like Guilford (1974), Haskins, Rose-St. Prix, and Elbaum (1997) found that race, background, and ethnicity could bias the evaluation process. They reported that the more similar the PT students were to their instructors, the greater the tendency was for the instructors to be lenient and give a higher score than is warranted. In contrast, they may be aware of this relationship and go out of their way to avoid being lenient, which could lower the scores. Whether positive or negative, this type of error is known as the error of leniency. Depending on the characteristics of the CI, the type of student (i.e., traditional versus nontraditional) could make a difference. Typically, coordinators at clinical sites do try to match the more experienced CIs with the more experienced students. This
may result in a greater probability that errors of leniency could occur. However, like the halo and reverse halo errors, leniency errors may equally affect traditional and nontraditional students.

Third, there is the error of central tendency whereby the rater tends to assign scores that are at or near the middle of the rating scale rather than using higher and lower scores to clearly distinguish the students’ strengths and weaknesses. This error generally occurs when the CIs are busy and do not take the time to conduct a thorough evaluation or properly complete the evaluation tool.

The fourth type of error is logical error, which occurs when instructors do not make distinctions between two items because they are similar to each other. For example, communicating with patients and educating patients are two skills included in The Clinical Performance Instrument (CPI). Although all CIs participate in training sessions and are provided with supplementary material defining these terms some may not understand the differences between these two skills and thus rate them the same.

Fifth, there is the proximity error, which refers to the rating of one item being influenced by the rating of another item due to the close proximity of the two items on the evaluation tool. Errors of central tendency, logical errors, and proximity errors can be made by clinical instructors who complete the CPI. However, the preponderance of such errors, if they exist, should be equal for both traditional and nontraditional students.

Finally, the sixth error, a contrast effect, occurs when the rating of one student is affected by the ratings of other students previously or currently assigned to the instructor. This is the only type of error among the six identified by Guilford (1974) that may differ for traditional and nontraditional students. The CIs could have high expectations for the nontraditional students because of their past work experiences, which could lower their scores if they don’t meet those
expectations. Other CIs could have lower expectations because the nontraditional students are older and have been away from the formal academic environment for varying lengths of time. In this situation, CIs may be pleasantly surprised by student performance and give higher scores than are warranted. Contrast error could affect the scores of traditional students as well, especially if they are being compared to nontraditional students. Although all CIs had been advised to avoid this type of error, it may be the most common type of error reflected in the ratings of clinical performance, which represents the dependent variable in this study.

The American Physical Therapy Association (APTA, 2000) has identified three additional sources of error: the mood, first impressions, and memory of the individual completing a performance evaluation. All clinical instructors affiliated with the MPT program in this study are required to use the CPI to evaluate student performance and receive training in how to use this assessment tool properly. They are also encouraged to become aware of any biases that they may have prior to rating their students. During a midterm phone call from the MPT program coordinator, both the students and the CIs are asked about the midterm evaluation process and results. If problems are identified at the midpoint, then further discussions with the CIs and/or students would attempt to solve those problems. If CIs are not able to be objective in evaluating the clinical skills of the MPT students they supervise, then new supervisors (CIs) are appointed. However, during the years involved in this study (2003-2006), all concerns were addressed effectively without changing the CIs involved.

Relationship between Clinical Performance and Past Professional Experience

No studies to date in the physical therapy literature have investigated the relationship of past professional experience to clinical performance. Even though studies in education and business have extensively documented the importance of past experience to successful learning
in general, only a few researchers have explored the effects of specific types of past experience on new learning. Generally theorists have reported that the more similar the past experience is to the new information being presented, the more easily the intended learning outcome may be achieved. This presumes that previous and current experiences are neither too similar nor too different for new learning to occur. I would hypothesize that the nontraditional students involved in this study may indeed have demonstrated better clinical performance than the traditional students because their past experiences as physical therapy assistants was sufficiently similar to, yet different from their clinical experiences in the MPT program.

One of the first theorists to make a statement concerning the role of past experience was Hull (1943), whose fifth postulate specifically addressed the type of past experience and how it affects the learners’ responses. This postulate was termed stimulus generalization and suggested that the more similar past experiences are to current learning demands, the greater the likelihood of desired responses or learning outcomes.

Piaget (1970) was one cognitivist who stressed that learning outcomes are unique to the learners’ past experiences. He claimed that the degree of similarity between existing internal structures and the new learning experience will determine whether assimilation or accommodation of the new information occurs. According to Piaget’s theory, the greater the degree of similarity between the previous experience and the new experience, the greater the level of assimilation. In contrast, accommodation would result when there is the need to create entirely new and different schemas to account for the new learning experience. Piaget emphasized that internal cognitive activity (i.e., either assimilation or accommodation) associated with previous experiences lead to new knowledge, attitudes, and skills for learners.
Argyris (1982) also reported that internal cognitive activity would lead to new knowledge and abilities, resulting in the creation of mental maps. Specifically, he noted that single loop learning utilized pre-existing work-related or life-related experiences as building blocks for understanding new information or experiences. The resulting learned responses would be more automatic, occur more quickly, and have greater meaning for learners. In contrast, double loop learning uses past experience to identify a conflict or a dilemma, which takes more time and conscious effort to resolve because it requires learners to change their mental maps.

Two transformational theorists discussed the importance of using past work and life experiences as the basis of learning. Merriam and Caffarella (1999) stated that it is only through a reflection on past experiences that individuals may be transformed. They reported that past experiences initially motivate learners to make sense of those experiences. This motivation may stimulate the process of new learning and lead to intended learning outcomes more quickly than if the learners had no relevant experiences upon which to reflect. However, these authors also emphasized that the transformational learning process requires a certain level of maturity that may not be attainable until adulthood.

Relationships of Clinical Performance to Other Variables

Some research has linked successful clinical performance with other variables such as social interaction skills (Gross, 1989); life experiences or age (Benor & Hobfoll, 1981; Kai-Pei Tan, Meredith, & McKenna, 2004); and academic performance (Kai-Pei Tan, Meredith, & McKenna, 2004; Tidd & Conine, 1974; Watson, Barnes, & Williamson, 2000). Gross (1989) used Jackson Personality Inventory to measure the social interaction skills of PT students and found that these skills were significant in predicting successful clinical performance.
Benor and Hobfoll’s (1981) study reported that the students’ life experiences led to better clinical performance. However, they defined life experience as age and clinical performance as interpersonal skills and empathy. Further, their study compared the skills and attitudes of only two narrow age groups: 21-24 years and 16-20 years. Kai-Pei Tan, Meredith, & McKenna (2004) also found that adult learners had better clinical performance due to their communication and interpersonal skills.

Several studies have shown academic performance (as measured by grades) to be positively related to clinical performance. Kai-Pei Tan, Meredith, and McKenna (2004) found cumulative GPA to be the best predictor of clinical performance for occupational therapy students. Tidd and Conine (1974) defined academic performance as the GPA based only on professional courses and similarly found a positive relationship with clinical performance in a PT program. The Watson, Barnes, and Williamson’s (2000) study also found that the physical therapy GPA was a good predictor of clinical performance as measured by the CPI, the same instrumentation used in my dissertation research.

In contrast, other studies have not shown a relationship between life experiences or age and clinical performance in a PT program (May, 1967; Thieman, Weddle, & Moore, 2003). However, May (1967) defined experience as a preadmission requirement of exposure to any work environment post high school. This work experience may have been different in nature from a PT experience and of short duration; therefore a possible reason behind the findings. Thieman, Weddle, and Moore’s (2003) study also did not find a significant relationship between experiences or age and clinical performance in a PT program. They simply attributed this lack of relationship to the difficulty of measuring clinical performance.
Other studies have found minimal to no relationship between academic performance and clinical performance (Gross, 1989; Mann, 1985; Silver & Hodgson, 1997; Thieman, Weddle, & Moore, 2003). Gross (1989) examined the influence of pre-professional academic criteria (i.e., the GPA, the Scholastic Aptitude Test (SAT), and the Nelson-Denny Reading Test) and did not find relationships with clinical performance. Mann (1985) also utilized multiple measures to define academic performance, including prerequisite course GPA, science GPA, and grades for several professional courses. He too was unable to find significant relationships with clinical performance. A third study found no relationship between GPA and clinical performance in a PT program (Thieman, Weddle, & Moore, 2003). A fourth study (Silver & Hodgson, 1997) found the same results for medical students, but they defined academic performance as undergraduate GPA, Medical College Admission Test, and National Board of Medical Examiner’s scores, part one.

The professional literature summarized in this chapter has focused on learning theories ranging from objectivism to constructivism and empirical research, which examined the effects of past experience and other variables on learning. Theoretical principles and research findings generally supported the notion that previous experience (if relevant, reflected upon, and applied to new learning) contributes to the achievement of the intended learning outcomes in the most effective, efficient, and expedient manner. Studies where desired learning outcomes pertained specifically to the clinical performance of students in PT and other health related programs have had mixed results regarding the impact of previous life experience, age, and academic criteria on professional skills. A literature search found no studies examining the effects of having or not having work experience as physical therapy assistants on the clinical performance of students enrolled in MPT programs. My study focused on this relationship, along with the effects of
tenure as a PTA before entering the MPT program, cumulative GPA earned during the coursework phase of the MPT program, and age at the time students initiated the final clinical affiliation associated with the MPT program at The University of Findlay.
CHAPTER III. METHODOLOGY

As previously noted, the main purpose of this study was to investigate the relationship between past professional work experience and the clinical performance of PT students. Other relationships that I analyzed included cumulative grade point average (GPA) and age with clinical performance. Chapter III includes information about the participants (i.e., students and clinical instructors), two data collection tools, the study’s procedure, and data analyses.

Participants

Students

The 157 students who completed a Master’s of Physical Therapy (MPT) program from The University of Findlay over a period of four years (i.e., 2003 to 2006) served as the population of this study. Data from two students were not used due to no midterm scoring. All of the remaining students (N=155) were enrolled full-time at The University of Findlay, a small Midwestern liberal arts university that offered a traditional MPT program and a weekend PTA to MPT program. Both groups of students had received bachelor’s degrees before pursuing their graduate degrees in PT. Those enrolled in the weekend program were adult learners who had completed one year or more of full-time employment as PT assistants before they entered the PT graduate program. All of the students successfully completed both their academic coursework and their full-time clinical internships and graduated with their MPT degrees in 2003, 2004, 2005, and 2006.

The traditional and nontraditional students were each given a clinical education manual, which included all of the policies and procedures of the UF’s clinical education program and a copy of The Clinical Performance Instrument (CPI) (APTA, 1997). Both groups in each class received instruction from the Academic Coordinator of Clinical Education (ACCE) on these
policies and procedures and the evaluation tool, the CPI. They were also given the opportunity to ask questions of the ACCE. The students completed similar coursework and clinical internships required for the MPT degree. The major difference in the internships completed by traditional and nontraditional students involved their scheduling, as outlined in Chapter I. In addition, all students were provided with the same university and PT program resources to develop their knowledge and skills; had similar access to clinical education resources and learning opportunities; and were expected to communicate regularly with their assigned advisors throughout the entire learning experience.

The primary factors that distinguished the nontraditional students from the traditional students were their age, previous professional experience, and course scheduling. As adult learners who had worked as physical therapy assistants for one or more years, nontraditional students in the weekend program were somewhat older and had more professional experience than the traditional students. Throughout the MPT program the traditional students enrolled in classes that met on various weekdays and occasionally required online work, whereas the classes for the nontraditional students all met on weekends (i.e., Fridays and Saturdays) and more regularly required online work.

Demographic variables used to describe the PT students included: (a) gender, (b) age (i.e., upon initiation of final affiliation), (c) years practicing as a PT assistant, and (d) cumulative grade point average in the MPT program. Data concerning these demographic characteristics were collected from students’ official records at The University of Findlay. In addition, their clinical performance in 24 areas and qualitative comments made by CIs describe both groups of students. It should be noted that none of the students was actively involved in providing data for this study. Rather, with the approval of appropriate review boards at both the researcher’s
doctoral institution and the institution involved in the study, data were obtained from existing
student records and a questionnaire completed by clinical instructors in 2006 who had supervised
the internships of both traditional and nontraditional students.

Clinical Instructors

All clinical instructors (CIs) were members of the clinical faculty of the MPT program at
The University of Findlay. Prior to supervising internships, they received oral and written
information concerning the policies and procedures of the clinical education program through the
ACCE. All CIs were given opportunities to ask questions during formal clinical site visits and
through informal means of communications (e.g., email and telephone). In addition, all CIs were
given similar access to university resources and opportunities to further develop their knowledge
and skills through the university’s faculty development program and the Clinical Instructor
Education and Credentialing seminar on a regular basis.

The clinical instructors were expected to provide their PT student interns with a thorough
orientation to their facility; quality supervision and clinical learning experiences; and both
formative and summative evaluations, which included completion of *The Clinical Performance
Instrument* (CPI) published by the American Physical Therapy Association (APTA, 1997). Of
the clinical instructors who had PT interns from The University of Findlay in 2006, the 29 who
had supervised both traditional and nontraditional students were also asked to complete a survey
comparing these two groups of students. Variables used to describe the clinical instructors
included: (a) gender, (b) age, (c) years practicing as a PT, (d) years practicing as clinical
instructors, (e) number of students supervised, and (f) participation in the Clinical Instructor
Education and Credentialing seminar. Data concerning the demographic characteristics of the
clinical instructors were collected from the Clinical Instructor’s Questionnaire in 2006.
Data Collection Tools

*The Clinical Performance Instrument* (APTA, 1997)

The summative evaluation tool, the fourth version of *The Clinical Performance Instrument* (CPI), published in 1997 by the American Physical Therapy Association (APTA) was initially approved for use in this study by the APTA Director of Publications. See Appendix A for the permission letter. Copies of the instrument were given to the CIs on the first day of students’ clinical affiliations and were completed at the midpoint and end of the clinical experience. A complete copy of the CPI may be found in the Department of Higher Education and Student Affairs at Bowling Green State University. A sample page, representing a total of 24 pages assessing clinical performance in 24 skill areas, may be found in Appendix B.

The 24 clinical skills assessed by the CPI are described in Chapter I. Each skill was rated by clinical instructors using a visual analogue scale (ten centimeters in length) having semantic differential anchors shown at the low end of the scale as *novice-level performance* and at the high end of the scale as *entry-level performance* (APTA, 1997; See Appendix B). A numerical value was obtained by measuring from the beginning of the scale to the markings (midterm and final) on the visual analogue scale with the use of a ruler. In addition to the rating scale, each page of the CPI provided boxes that could be checked to indicate the skill was *not observed* by the CI; was performed at an *exceptional level* (i.e., with distinction); or was at an unacceptable level and the CI had *significant concerns*. Sections seeking comments to further describe clinical performance were included on each page for the midterm and final. A summative comment section was used to describe the students’ overall performance at the midpoint and final. In this final section, clinical instructors were asked to describe the students’ strengths, areas needing improvement, and general performance.
All CIs were instructed both orally and in writing to consider five qualitative dimensions when completing the rating scales. These included *quality of care, supervision/guidance required, consistency of performance, complexity of task/environment, and efficiency of performance* (APTA, 1997). The *quality of care* dimension refers to the overall level of competence that students demonstrated. Their performance should have outcomes that meet the goals of their clients. The CIs considered quality of care ranging from limited to highly skilled performance. The second dimension, *supervision/guidance required*, pertains to the amount of assistance required or requested by the students. This dimension varies with the complexity of the clinical situation. Considerations may be indicative of full-time monitoring, cueing for assistance, and independent performance with consultation. *Consistency of performance*, the third dimension to be considered, is based on observations of desired behaviors ranging from infrequent to routine. *Complexity of task and environment* is the fourth dimension to be considered and involves consideration of simple to complex cases, tasks, and environmental situations. The fifth and last dimension is *efficiency of performance*, which considers the students’ ability to be cost effective and timely with their clinical performance.

Only the third version of the CPI has been tested for reliability and validity (Task Force for the Development of the CPI, 2002). The Task Force (2002) found the intraclass correlation coefficient measuring the interrater reliability of the physical therapist CPI total score to be good with the score of .87. Construct validity was suggested by the differences in mean scores of students completing their first clinical experiences and their final clinical experiences. In addition, the Task Force reported discriminant validity based on the lack of correlation between scores on the CPI and the Social Skills Inventory. The fourth, most recent version of the CPI has
yet to be tested for psychometric properties. However, this version has been used to assess the clinical performance of all PT students in the state of Ohio since it was released in 1997.

*Clinical Instructor’s Questionnaire*

Appendix C provides a copy of a cover letter and follow-up postcard associated with a simple CIs questionnaire designed to yield greater understanding of the differences between the two groups of MPT students involved in this study. A copy of this questionnaire, which has seven demographic items (fill-in-the-blank) and three open-ended questions, is provided in Appendix D. The three major questions concerned group differences, similarities, and possible explanations for the differences and similarities.

Originally designed to take about fifteen minutes to complete, the questionnaire was first reviewed by several selected PT faculty who had an understanding of the clinical education experience required by the MPT program. It was next pilot-tested with a small group of CIs and revised in response to the reviews. Finally it was distributed by mail to a select group of 29 clinical instructors in 2006 who had supervised both traditional and nontraditional students during their tenure as CIs for the MPT program at The University of Findlay.

*Procedure*

Prior to the initiation of this study, Human Subjects Review Board (HSRB) approval was received from Bowling Green State University (i.e., the investigator’s doctoral institution) and Institutional Research Board (IRB) approval was received from The University of Findlay (i.e., the institution involved in the study). Appendix E contains the letters granting approval from the review boards at these two institutions. No consent from PT students was required for the utilization of existing student data including demographic characteristics and clinical performance scores and comments. Similarly, no consent was required from the CIs who
provided the quantitative and qualitative information contained in the CPI. The only formal consent to participate in the study was indicated by the completion and return of the questionnaire designed specifically for this research.

Approval of the research proposal was obtained from the institutional review boards and the researcher’s dissertation committee halfway through the four year period involved in this study. Permission to use the data from 2003 and 2004 cohorts was granted even though those students had already graduated. The final data set was not completed until 2005 and 2006 cohorts had also successfully completed their final clinical affiliations and graduated from the MPT program. The clinical internships provided traditional and nontraditional students with similar learning experiences that involved: (a) inpatient settings with the focus of neuromuscular, cardiopulmonary, and integumentary patterns; (b) outpatient settings with the focus of musculoskeletal patterns; and (c) settings with the focus chosen by the student. That is, all MPT students must have clinical experiences in both inpatient and outpatient settings before choosing the setting for their final clinical affiliation. Similarly, they must have exposure to all four practice patterns associated with PT interventions, as described in *The Guide to PT Practice* (APTA, 2001), and to clients across the lifespan.

Traditional students had clinical affiliations interspersed throughout the curriculum, whereas nontraditional students had all of the affiliations clustered at the end of the academic program. Hence, the researcher collected and compared only data pertaining to the last clinical affiliation, which was completed by both groups of students during their final semester of enrollment before receiving their MPT degrees.

Clinical instructors (CIs) completed summative evaluations of the clinical performance of PT students assigned to them at the midpoint and the end of the final affiliations. As noted earlier
in this chapter, the assessment tool used by the CIs was *The Clinical Performance Instrument* (APTA, 1997), which used both quantitative data derived from ratings on visual analog scales and qualitative information provided as comments to assess student performance in 24 professional skill areas as specified by the American Physical Therapy Association.

All CIs were asked to complete the midterm and final CPI evaluations and return all copies to the Academic Coordinator of Clinical Education (ACCE) within two weeks after the final clinical education experience. If necessary, the ACCE called CIs to remind them to return the completed instruments so as to obtain a response rate as close as possible to 100%.

In addition, the questionnaire designed to yield greater understanding of the two groups’ differences and similarities was developed, reviewed, pilot tested, and mailed to the 29 CIs in 2006 who had supervised students from both groups. The qualitative data in the comment sections of the CPI provided some examples of these differences and similarities. However, data from a third source, such as this questionnaire, is a form of triangulation that can provide greater depth of information and a higher degree of credibility to the findings (Erlandson, Harris, Skipper, & Allen, 1993).

The only CIs who received the cover letter and questionnaire (See Appendices C and D) were the 29 CIs in 2006 who had supervised the clinical internships of both traditional and nontraditional students. Reminder postcards were sent to the CIs who had not yet returned their questionnaires approximately two weeks and four weeks after the initial mailing. A copy of this postcard is provided in Appendix C.

All hard copies of the data from *The Clinical Performance Instrument* and the Clinical Instructor’s Questionnaire were stored in a locked file cabinet in my office at The University of
Findlay. Data and output files, none of which identified individual students by name, were saved on a computer in the same location.

Data Analysis

With the assistance of the Director of the Statistical Consulting Center at Bowling Green State University, the quantitative data were analyzed using both the Statistical Package for the Social Sciences (SPSS) and the Statistical Analysis System (SAS). These data, initially entered on an SPSS spreadsheet, were first checked for missing values, outliers, normality, and linearity. As a result, two students with missing midterm scores were deleted from the sample and one student with outlying scores was omitted from selected analyses that are described in Chapter IV.

Descriptive statistics (i.e., frequencies, percentages, ranges, means, and standard deviations) were used to summarize the demographic characteristics of the clinical instructors and the PT students involved in this study. Some of these statistics described the ages, genders, years of experience as physical therapists, years as clinical instructors, numbers of assigned students, and Credentialed Instructor status of clinical instructors. Other descriptive statistics pertained to students’ genders, ages, cumulative grade point averages, types of clinical sites, and years of experience as PT assistants. These statistics were used to describe the total group of PT students and the two subgroups of 104 nontraditional PTA to MPT students and 51 traditional MPT students whose clinical performance was compared in this study.

Two sets of quantitative scores, recorded as percentages ranging from 1 to 100 on the 24 rating scales associated with the 24 professional skills assessed by The Clinical Practice Instrument (APTA, 1997) at the midpoint and the end of the final clinical affiliation, were used to compare the clinical performance of traditional and nontraditional PT students. As previously explained, this numerical value was obtained by using a ruler to measure the distance from the
beginning of the scale to the markings made by the CIs. First, multivariate analysis of variance was performed with the whole set of skills and significant differences were found between the two groups. However, major limitations included the inability to utilize data without variability (e.g., skills 1 to 6 and 8) and to account for the skills not observed, which was read as missing data.

A series of t-tests were used to determine whether observed differences in the mean performance ratings of these two groups were statistically significant. The alpha level was set at .05. The effect size, “also known as the correlation ratio or $R^2$” (Levine & Hullett, 2002, p. 615), was also calculated and reported for each t-test. Similar t-test procedures were used to examine group differences in performance score changes from the midterm to the final for all 24 skills.

Chi-square analyses were also used to compare the two groups in terms of their proportions of exceptional scores and not observed clinical performance skills. These analyses, with the alpha level set at .05, were completed at the midterm and the final for both variables. For some of the skills, Fisher’s exact test was used because zero percent of the traditional students had exceptional scores.

I next used Pearson product moment correlation coefficients to determine the direction, strength, and statistical significance (using alpha set at .05) of correlations between cumulative grade point average and both the midterm and final clinical performance scores of nontraditional students on the 24 CPI rating scales. Correlations with the CPI ratings were also computed for student ages and numbers of years of professional experience as physical therapy assistants. I chose to remove one outlier and therefore data from 103 nontraditional students were used in these analyses.
After statistical significance testing was completed, qualitative data from the pertinent comment sections of the CPI were coded for common units by the investigator. The frequency of the coded units was compiled and reported for the two groups: (a) the nontraditional PTA to MPT students and (b) the traditional MPT students. In addition, each comment was identified as being a strength or area in which the student excels versus an area that the student needs to develop further. A student employee verified the tallying of strengths and areas requiring improvement. The main intent for the use of this qualitative data was to provide verification of the results from the quantitative data.

The final source of data was from the 17 CI responses to a simple questionnaire developed for this study. Descriptive statistics (i.e., frequencies, percentages, ranges, means, and standard deviations) were used to summarize the quantitative data describing the CIs and their clinical sites. Qualitative data were first transcribed in an aggregate form. I then sorted the responses into three basic units: (a) differences, (b) similarities, and (c) reasons for the differences and similarities of the traditional and nontraditional students involved in this study. After analyzing each unit to identify common themes, an Academic Coordinator of Clinical Education independently completed the same process and the two sets of themes were compared to determine consistency. The primary purpose of these analyses was to increase my understanding of the data from the CPI. Of particular interest were group differences in professional skills and possible reasons for those differences, especially when explanations concerned the effect of past professional experience on clinical performance.

In summary, my study involves the analyses of data from three different sources: (a) scores from The Clinical Performance Instrument, gathered from 2003 to 2006, (b) qualitative CPI comments, also obtained from 2003 to 2006, and (c) qualitative remarks from a
questionnaire sent to clinical instructors in 2006 who had supervised both traditional and nontraditional students. The results based on each of these sources of information are summarized separately in Chapter IV. However, results that are supported by data from multiple sources are discussed in the fifth and concluding chapter of this dissertation. Triangulation was used to strengthen the study. Worthen, Sanders, and Fitzpatrick (1997, p. 394) reported that triangulation is, “the use of mixed methods to measure the same construct and thus increase the validity of results for that construct.” In this case, the strength of the relationship between past work experience and clinical performance was measured.
CHAPTER IV. RESULTS

Quantitative data from the Clinical Performance Instrument (APTA, 1997) completed for all 157 students who graduated from the master of physical therapy (MPT) program at The University of Findlay between 2003 and 2006 were screened for missing values, outliers, normality, and linearity. As a result of these preliminary analyses, two students were deleted from the sample because they had no midterm scores on the CPI. Data for the remaining students (N=155; 51 traditional and 104 nontraditional) were examined in all analyses except the correlation procedures that pertained only to nontraditional students.

Chapter IV describes the demographic characteristics of the participants (clinical instructors and students) and the clinical sites involved in this study. Group differences in the clinical performance scores of the traditional and nontraditional students (at the midterm and final), the degree of change in clinical performance scores, numbers of exceptional scores, and numbers of not observed skills are then presented. These findings are followed by results regarding the relationship of GPA, experience, and age with the clinical performance of nontraditional students. Finally, the qualitative data from the comment sections of the CPI and the clinical instructor questionnaire are summarized.

Demographic Characteristics of Participants

Clinical Instructors

In 2006, there were 29 clinical instructors (CIs) who had worked with both traditional and nontraditional students and thus received the clinical instructor questionnaire (See Appendix D). Of these, 17 (58.6%) completed and returned the questionnaire. They had supervised students for an average of 9 years, with a range of 2 to 20 years. During this time period, they had supervised between 2 and 40 traditional students and between 1 and 5 nontraditional
students. Forty-one percent of the CIs were male and 59% were female. Their average age was 36 years, with a range of 29 to 52 years. On average, they had worked as licensed physical therapists for 11 years, with a range of 5 to 22 years. Although all CIs received orientation and information from The University of Findlay’s PT faculty before receiving approval to supervise student interns, 24% of the CIs had received advanced training through the Clinical Instructor Education and Credentialing Seminar.

**Students**

After two students with missing midterm scores were removed, 51 traditional students and 104 nontraditional students remained in the sample. All of these 155 students had CPI scores or a recording of *skills not observed* for all 24 skills at the midpoint and end of their final clinical affiliations. Definitions of each of these 24 skills may be found in Chapter I. The *skills not observed* response was left blank in the data set to distinguish it from the numerical scores. All demographic data describing the students were available except for the number of years of past work experience completed by two nontraditional students.

The mean age of all students was 31.2 years (SD = 7.04) and the range was 23 to 51 years. The mean age of the traditional students was 24.2 years (SD = 2.27). Although their ages ranged from 23 to 38, all traditional students were 23 or 24 years old with the exception of two students who were 31 and 38 years old. On the average, nontraditional students were approximately 10 years older, with a mean of 34.6 years (SD = 6.00) and a range of 26 to 51. The mean ages of the two groups were found to differ significantly; $t (146) = 15.49, p < .01$.

Forty percent of the total students were male ($f = 62$) and sixty percent were female ($f = 93$). About one half of the nontraditional students (49.0%), but less than one quarter (21.6%) of
the traditional students were male. The proportions of men and women in the two groups differed significantly; $\chi^2(1) = 10.76, p < .01$.

None of the traditional students had prior experience as physical therapy assistants (PTAs). In contrast, all of the nontraditional students were licensed as PTAs and had worked as PTAs for 2 to 23 years ($M = 6.4$ years, $SD = 2.98$) before entering MPT program. In addition, they continued to work as PTAs during the two years during which they completed their academic coursework.

The mean cumulative professional grade point average (GPA) of all students was 3.7 ($SD = .25$) and the range was 3.1 to 4.0. On the average, the nontraditional students had a lower cumulative GPA ($M = 3.6$, $SD = .23$, range = 3.1-4.0) than did the traditional students ($M = 3.9$, $SD = .19$, range = 3.4-4.0). This group difference in cumulative GPA was found to be statistically significant; $t (153) = 7.39, p < .01$.

**Description of Clinical Sites**

As noted in Chapter III, students in the MPT program must complete one affiliation in the inpatient setting and one affiliation in the outpatient setting before choosing their third and final clinical affiliation. As noted in Table 1, students in both groups chose a variety of settings for their final affiliation. The most popular setting, chosen by 44% of the students, was the outpatient clinic. This setting was chosen by 51% of the nontraditional students and 29% of the traditional students. In contrast, the industrial rehabilitation setting was selected by only two nontraditional students, representing 1.3% of the total sample. The numbers and percentages of students choosing other clinical settings (i.e., general acute care hospital, rehabilitation hospital, pediatric facility, sports medicine facility, and health and wellness facility) for their final affiliations are also provided in Table 1.
Table 1

Types of Clinical Sites Used During the Final Affiliation

<table>
<thead>
<tr>
<th>Clinical Sites</th>
<th>Nontraditional Students</th>
<th>Traditional Students</th>
<th>Total Students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$f$</td>
<td>%</td>
<td>$f$</td>
</tr>
<tr>
<td>General Acute Care Hospital</td>
<td>3</td>
<td>2.9</td>
<td>8</td>
</tr>
<tr>
<td>Rehabilitation Hospital</td>
<td>10</td>
<td>9.6</td>
<td>6</td>
</tr>
<tr>
<td>Outpatient Clinic</td>
<td>53</td>
<td>51.0</td>
<td>15</td>
</tr>
<tr>
<td>Pediatric Facility</td>
<td>19</td>
<td>18.3</td>
<td>10</td>
</tr>
<tr>
<td>Sports Medicine Facility</td>
<td>9</td>
<td>8.7</td>
<td>9</td>
</tr>
<tr>
<td>Industrial Rehabilitation</td>
<td>2</td>
<td>1.9</td>
<td>0</td>
</tr>
<tr>
<td>Health &amp; Wellness Facility</td>
<td>8</td>
<td>7.7</td>
<td>3</td>
</tr>
</tbody>
</table>

Note. $n = 104$ nontraditional students; $n = 51$ traditional students

Clinical Performance Scores at Midterm and Final

Initial analyses (i.e., multivariate analyses of variance) of the whole set of clinical performance scores, as measured by the Clinical Performance Instrument (CPI), showed significant differences between the two groups of traditional and nontraditional students at both the midterm and the final. Group differences in the midterm scores for the 24 individual skills were next examined using 24 independent samples $t$-tests. These procedures were then repeated with the 24 final scores. All $t$-tests compared the variances for the two groups. If the variances were found to be significantly different, then the Satterthwaite approximate $t$ statistic was used. The results of these analyses are discussed in the following two sections, which provide the means, standard deviations, $t$ values, degrees of freedom, $p$ values, and effect sizes ($R^2$) for all significant differences in Tables 2 and 3.
Midterm Results

Mean scores for 23 of the 24 professional skills assessed by clinical instructors at the midterm were slightly higher for nontraditional students than traditional students in the sample. The means and standard deviations of all scores for both groups at the midterm are provided in Appendix F. However, as noted in Table 2, these differences were statistically significant for only four of the skills: (a) communication, (b) evaluation, (c) treatment, and (d) education. These and other clinical performance skills are defined in Chapter I.

At the midterm, traditional students in the sample slightly outscored nontraditional students only in the area of consultation. However, it should be noted that this group difference was not statistically significant at the \( p < .05 \) level. Further, this difference was based on the scores for only 31.4% of the traditional students and 51.0% of the nontraditional students. Clinical instructors indicated that they had not observed the remaining students performing consultation skills by the time they completed midterm evaluations of students’ professional skills, using the Clinical Performance Instrument.

Table 2

<table>
<thead>
<tr>
<th>CPI skills</th>
<th>Nontraditional Students</th>
<th>Traditional Students</th>
<th>( t ) (df)</th>
<th>( p )</th>
<th>( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>92.40</td>
<td>87.78</td>
<td>-2.34 (153)</td>
<td>.02</td>
<td>.03</td>
</tr>
<tr>
<td>Evaluation</td>
<td>88.01</td>
<td>81.82</td>
<td>-2.41 (.81)</td>
<td>.02</td>
<td>.04</td>
</tr>
<tr>
<td>Treatment</td>
<td>93.27</td>
<td>85.14</td>
<td>-4.20 (150)</td>
<td>&lt;.01</td>
<td>.11</td>
</tr>
<tr>
<td>Education</td>
<td>92.17</td>
<td>86.38</td>
<td>-2.63 (145)</td>
<td>&lt;.01</td>
<td>.05</td>
</tr>
</tbody>
</table>
**Final Results**

Compared to traditional students in the sample, nontraditional students had slightly higher final mean scores for all 24 professional skills (see Appendix G) and significantly higher mean scores for half of these skills: (a) critical inquiry, (b) examination, (c) evaluation, (d) plan of care, (e) treatment, (f) quality of care, (g) consultation, (h) resource management, (i) support personnel, (j) professional/social responsibility, (k) career/lifelong learning, and (l) wellness.

Table 3 provides a summary of these significant group differences.

Table 3

*Significant Group Differences in Clinical Performance Scores at the Final*

<table>
<thead>
<tr>
<th>CPI skills</th>
<th>Nontraditional Students</th>
<th>Traditional Students</th>
<th>$t$ (df)</th>
<th>$p$</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Inquiry</td>
<td>99.88 1.09</td>
<td>96.98 7.96</td>
<td>-2.59 (50.9)</td>
<td>.01</td>
<td>.08</td>
</tr>
<tr>
<td>Examination</td>
<td>99.81 1.96</td>
<td>98.04 4.64</td>
<td>-2.59 (57.6)</td>
<td>.01</td>
<td>.07</td>
</tr>
<tr>
<td>Evaluation</td>
<td>99.90 .98</td>
<td>97.66 5.30</td>
<td>-2.97 (50.6)</td>
<td>.01</td>
<td>.10</td>
</tr>
<tr>
<td>Plan of Care</td>
<td>99.85 1.14</td>
<td>98.26 4.81</td>
<td>-2.30 (51.7)</td>
<td>.03</td>
<td>.06</td>
</tr>
<tr>
<td>Treatment</td>
<td>99.96 .39</td>
<td>97.90 5.20</td>
<td>-2.82 (50.3)</td>
<td>.01</td>
<td>.10</td>
</tr>
<tr>
<td>Quality of Care</td>
<td>99.89 .94</td>
<td>97.41 5.94</td>
<td>-2.90 (49.2)</td>
<td>.01</td>
<td>.10</td>
</tr>
<tr>
<td>Consultation</td>
<td>99.81 .97</td>
<td>97.69 4.26</td>
<td>-2.52 (25.8)</td>
<td>.02</td>
<td>.14</td>
</tr>
<tr>
<td>Resource Management</td>
<td>99.78 2.16</td>
<td>98.18 5.14</td>
<td>-2.14 (58.8)</td>
<td>.04</td>
<td>.05</td>
</tr>
<tr>
<td>Support Pers.</td>
<td>99.90 .59</td>
<td>98.17 4.45</td>
<td>-2.68 (47.8)</td>
<td>.01</td>
<td>.09</td>
</tr>
<tr>
<td>Professional./Social</td>
<td>99.94 .50</td>
<td>98.84 3.56</td>
<td>-2.16 (48.9)</td>
<td>.04</td>
<td>.06</td>
</tr>
<tr>
<td>Career/Lifelong</td>
<td>99.98 .20</td>
<td>98.63 4.16</td>
<td>-2.32 (50.1)</td>
<td>.02</td>
<td>.07</td>
</tr>
<tr>
<td>Wellness</td>
<td>99.89 .64</td>
<td>97.60 5.55</td>
<td>-2.60 (39.5)</td>
<td>.01</td>
<td>.11</td>
</tr>
</tbody>
</table>
Comparisons of Appendices F and G or Tables 2 and 3 show that variability in student scores on the CPI is consistently somewhat lower at the final than at the midterm. This is largely a function of a ceiling effect, indicating that by the time almost all MPT students completed their final affiliations they were able to demonstrate entry-level performance (i.e., a score of 100) on almost all professional skills measured by the CPI. In fact, for seven skills all 104 nontraditional students received scores of 100. With no variability in these scores and very limited variability in other scores, the results of significance tests must be interpreted with great caution.

Degree of Change in Clinical Performance Scores from Midterm to Final

For 22 of the 24 professional skills, changes in CPI scores from the midterm to the final (final scores minus midterm scores) did not differ significantly for the two groups. However, as shown in Table 4, midterm-to-final changes in skills related to treatment and education were significantly greater for traditional than nontraditional students.

Table 4

| Significant Group Differences in Midterm-to-Final Changes in Clinical Performance Scores |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|
| CPI skills                      | Nontraditional Students | Traditional Students |
| M     SD | M   SD | t (df) | p     | R²   |
| Treatment | 6.70 10.40 | 13.00 10.62 | 3.49 (150) | .01  .07 |
| Education | 7.61 11.20 | 12.52 13.06 | 2.38 (145) | .02  .04 |

Number of Exceptional Scores

As shown on the sample page from the CPI provided in Appendix B, clinical instructors had an opportunity to check boxes labeled with distinction to indicate exceptional performance
on the 24 professional skills assessed at the midterm and final. Contingency table analyses (i.e., chi-square tests) were used to examine group differences in the proportions of students receiving these exceptional scores. These procedures were conducted for all 24 professional skills at the midterm and at the final. If proportions were too small, Fisher’s exact test was used. In addition, skills marked with distinction were summed to create a total number of exceptional scores for each student. $T$-tests were used to compare the average total number of exceptional scores obtained by students in the two groups. As noted in Table 5, the nontraditional students had significantly higher percentages of exceptional scores for (a) safety, (b) responsibility, (c) documentation, (d) cultural diversity, (e) screening, and (f) treatment at the midterm.

### Table 5

<table>
<thead>
<tr>
<th>CPI skills</th>
<th>Nontraditional Students</th>
<th>Traditional Students</th>
<th>$x^2$ (df)</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>19.23</td>
<td>0.00</td>
<td>*</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Responsibility</td>
<td>23.08</td>
<td>5.88</td>
<td>7.03 (1)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Documentation</td>
<td>15.38</td>
<td>1.96</td>
<td>6.31 (1)</td>
<td>.01</td>
</tr>
<tr>
<td>Cultural Diversity</td>
<td>13.46</td>
<td>0.00</td>
<td>*</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Screening</td>
<td>8.65</td>
<td>0.00</td>
<td>*</td>
<td>.03</td>
</tr>
<tr>
<td>Treatment</td>
<td>13.46</td>
<td>0.00</td>
<td>*</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>

* No $x^2$ statistic due to use of Fisher’s exact test

At the final, the nontraditional students had significantly higher percentages of exceptional scores for (a) cultural diversity, (b) critical inquiry, (c) screening, (d) examination,
(e) evaluation, (f) treatment, (g) quality of care, (h) service management, (i) resource management, (j) career/lifelong learning, and (k) wellness (See Table 6).

Table 6

Percentages of Exceptional Scores at the Final

<table>
<thead>
<tr>
<th>CPI skills</th>
<th>Nontraditional Students</th>
<th>Traditional Students</th>
<th>$x^2$ (df)</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural Diversity</td>
<td>32.69%</td>
<td>13.73%</td>
<td>6.33 (1)</td>
<td>.01</td>
</tr>
<tr>
<td>Critical Inquiry</td>
<td>26.92%</td>
<td>3.92%</td>
<td>11.60 (1)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Screening</td>
<td>20.19%</td>
<td>1.96%</td>
<td>9.34 (1)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Examination</td>
<td>23.30%</td>
<td>9.80%</td>
<td>3.96 (1)</td>
<td>.05</td>
</tr>
<tr>
<td>Evaluation</td>
<td>15.38%</td>
<td>3.92%</td>
<td>4.38 (1)</td>
<td>.04</td>
</tr>
<tr>
<td>Treatment</td>
<td>36.54%</td>
<td>13.73%</td>
<td>8.64 (1)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Quality of Care</td>
<td>18.27%</td>
<td>5.88%</td>
<td>4.31 (1)</td>
<td>.04</td>
</tr>
<tr>
<td>Service Management</td>
<td>14.42%</td>
<td>3.92%</td>
<td>3.86 (1)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Resource Management</td>
<td>27.88%</td>
<td>11.76%</td>
<td>5.09 (1)</td>
<td>.02</td>
</tr>
<tr>
<td>Career/Lifelong</td>
<td>29.81%</td>
<td>11.76%</td>
<td>6.13 (1)</td>
<td>.01</td>
</tr>
<tr>
<td>Wellness</td>
<td>14.42%</td>
<td>1.96%</td>
<td>5.74 (1)</td>
<td>.02</td>
</tr>
</tbody>
</table>

The nontraditional students also had a significantly higher total number of exceptional scores at the midterm and final combined than did the traditional students. The mean of the total number of exceptional scores for the nontraditional student group was 5.92 ($SD = 7.56$) and for the traditional student group was 2.96 ($SD = 3.88$); $t (153) = -3.22, p < .01$. 
Number of Not Observed Skills

For each professional skill measured by the CPI, clinical instructors had an opportunity to check a box labeled *not observed*. Group differences in the numbers of not observed skills were analyzed using contingency table analyses (i.e., chi-square tests). These procedures were conducted for the midterm and the final to determine whether CIs similarly observed the two groups of students performing each of the 24 professional skills. If insufficient numbers of students were observed performing a given skill, Fisher’s exact test was used.

At the midterm and final, only one significant group difference was found. This difference indicated that clinical instructors were less likely to observe traditional students engaged in consulting activities. At the midterm, the percentages of *not observed* responses for consultation were 49.0% for the nontraditional students and 68.6% for the traditional students; $\chi^2(1) = 5.32, p = .02$. At the final, the corresponding percentages were 23.1% and 49.0%, respectively; $\chi^2(1) = 10.65, p < .01$.

Relationships of Experience, GPA, and Age to Clinical Performance of Nontraditional Students

Pearson product moment correlation coefficients examined the relationships of clinical performance to years of work experience as PTAs, cumulative GPA, and age. These procedures involved CPI scores both at the midterm and at the final for the nontraditional student group only.

*Years of Work Experience*

At the midterm, only two skills were significantly related to years of work experience and both of these relationships were negative. The skills were professionalism ($r = -.22, p = .03$) and examination ($r = -.23, p = .02$). At the final, there were eight skills found to have significant inverse relationships with years of work experience: (a) documentation, (b) examination, (c)
evaluation, (d) plan of care, (e) treatment, (f) service management, (g) resource management, and (h) wellness (See Table 7).

Table 7

*Relationships between Years of Experience and Clinical Performance at Final CPI skills*

<table>
<thead>
<tr>
<th>CPI skills</th>
<th>r</th>
<th>n</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documentation</td>
<td>-.36</td>
<td>102</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Examination</td>
<td>-.22</td>
<td>102</td>
<td>.02</td>
</tr>
<tr>
<td>Evaluation</td>
<td>-.46</td>
<td>102</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Plan of Care</td>
<td>-.35</td>
<td>102</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Treatment</td>
<td>-.46</td>
<td>102</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Service Management</td>
<td>-.38</td>
<td>92</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Resource Management</td>
<td>-.46</td>
<td>102</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Wellness</td>
<td>-.37</td>
<td>89</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>

*Effect of an outlier on correlations between work experience and professional skills*

After further inspection of the data through frequency distributions and scatter plots, it was discovered that one or two outliers were contributing to these findings. With the removal of the most extreme outlier, who had 20 years of experience and unexpectedly low scores for clinical performance, only two of the skills shown in Table 7 continued to show significance: documentation ($r = -.20, p = .04$) and examination ($r = -.26, p < .01$).

*Cumulative GPA*

At the midterm, no relationship was found between cumulative grade point average and clinical performance pertaining to 23 of the 24 professional skills. Only professional/social responsibility was significantly (and positively) related to cumulative GPA in the nontraditional
student group; \( r = .22, p < .03 \). Similarly, at the final, only one skill (i.e., education) was found to be significantly (but in this case negatively) related to cumulative GPA; \( r = -.19, p < .05 \).

**Age**

At the midterm six professional skills were found to be inversely related to student age. As noted in Table 8, these included: (a) professionalism, (b) communication, (c) cultural diversity, (d) education, (e) resource management, and (f) career/lifelong learning.

Table 8

*Relationships between Age and Clinical Performance at Midterm*

<table>
<thead>
<tr>
<th>CPI skills</th>
<th>( r )</th>
<th>( n )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professionalism</td>
<td>-.25</td>
<td>104</td>
<td>.01</td>
</tr>
<tr>
<td>Communication</td>
<td>-.29</td>
<td>104</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Cultural diversity</td>
<td>-.27</td>
<td>104</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Education</td>
<td>-.20</td>
<td>97</td>
<td>.05</td>
</tr>
<tr>
<td>Resource management</td>
<td>-.22</td>
<td>103</td>
<td>.02</td>
</tr>
<tr>
<td>Career/lifelong learning</td>
<td>-.23</td>
<td>100</td>
<td>.02</td>
</tr>
</tbody>
</table>

Only two skills were significantly related to age at the final. These were documentation \( (r = -.22, p = .03) \) and examination \( (r = -.27, p < .01) \).

*Effect of an outlier on correlations between age and professional skills*

With removal of the one outlier noted above, the education skill at the midterm and the documentation skill at the final were no longer significantly related to the ages of the nontraditional students. However, the remaining five skills listed in Table 8 and the examination skill at the final continued to be inversely related to student age.
Comment Sections of CPI

Qualitative data from the pertinent comment sections of the CPI were also coded for common themes by the investigator. There were a total of 16,958 lines of data regarding the two groups of students. Analyses resulted in sixteen common themes associated with the following terminology: (a) safety and safe; (b) responsibility and responsible; (c) communication and communicate; (d) documentation and document; (e) cultural diversity, sensitivity, and differences; (f) critical inquiry, problem solve, think, and judgment; (g) screening, examination, and examine; (h) evaluation, evaluate, goals, and plan of care; (i) treatment, treat, and quality of care; (j) education and educate; (k) service and resource management; (l) consultation and consult; (m) support personnel and delegate; (n) professional and social responsibility; (o) career, mature, and life-long learning; and (p) wellness and fitness.

The frequencies of the coded themes for the two groups of students are provided in Table 9. Note that these frequencies should be interpreted in conjunction with the numbers of students in each group. For example, 131 comments regarding safety/safe were made about 104 nontraditional students. This is equivalent to 1.26 comments per student. The 64 comments regarding safety/safe that were made about 51 traditional students are equivalent to 1.25 comments per student. Thus, interpretation of the numbers in Table 9 should take into account the fact that there were approximately twice as many nontraditional as traditional students involved in these analyses.

Notable in the table is that the frequencies of clinical instructor comments within the 16 themes were similar for the two groups. For example, the greatest numbers of comments for both groups involved: (a) evaluation, evaluate, goals, and plan of care; (b) treatment, treat, and quality of care; (c) communication and communicate; and (d) documentation and document.
Table 9

*Frequency of Coded Themes from the Comment Section of CPI*

<table>
<thead>
<tr>
<th>Coded themes</th>
<th>Nontraditional Students</th>
<th>Traditional Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety/Safe</td>
<td>131</td>
<td>64</td>
</tr>
<tr>
<td>Responsibility/Responsible</td>
<td>49</td>
<td>21</td>
</tr>
<tr>
<td>Communication/Communicate</td>
<td>254</td>
<td>135</td>
</tr>
<tr>
<td>Documentation/Document</td>
<td>233</td>
<td>154</td>
</tr>
<tr>
<td>Cultural diversity/Sensitivity</td>
<td>41</td>
<td>22</td>
</tr>
<tr>
<td>Critical inquiry/Problem solve/Think/Judgment</td>
<td>57</td>
<td>34</td>
</tr>
<tr>
<td>Screening/Examination/Examine</td>
<td>217</td>
<td>127</td>
</tr>
<tr>
<td>Evaluation/Evaluate/Goals/Plan</td>
<td>332</td>
<td>224</td>
</tr>
<tr>
<td>Treatment/Treat/Quality of care</td>
<td>323</td>
<td>207</td>
</tr>
<tr>
<td>Education/Educate</td>
<td>142</td>
<td>84</td>
</tr>
<tr>
<td>Service/Resource management</td>
<td>127</td>
<td>75</td>
</tr>
<tr>
<td>Consultation/Consult</td>
<td>46</td>
<td>12</td>
</tr>
<tr>
<td>Support personnel/Delegate</td>
<td>36</td>
<td>28</td>
</tr>
<tr>
<td>Professional/Social responsibility</td>
<td>232</td>
<td>131</td>
</tr>
<tr>
<td>Career/Life-long learning/Mature</td>
<td>29</td>
<td>7</td>
</tr>
<tr>
<td>Wellness/Fitness management</td>
<td>28</td>
<td>13</td>
</tr>
</tbody>
</table>

Note: \( n = 104 \) for nontraditional MPT program; \( n = 51 \) for traditional MPT program

I was most interested in determining the type of comments that were given to each group of students. Hence, I analyzed the content of each comment to distinguish between a strength or a skill in which the student excelled versus a weakness or a skill that the student needed to
further develop. For example, a comment that would be designated as a strength is, “Documents in a timely manner using accurate information which is consistent with guidelines and regulations” (lines 22-23). In contrast, “Continues to improve time management skills of juggling the busy work day schedule” (lines 58-59) would be labeled as an area that needs further development.

The results of these analyses regarding the percentages of comments that were identified as strengths or an areas needing improvement are summarized in Table 10. It is interesting to note that for all 16 coded units the percentages of comments pertaining to nontraditional students (versus traditional students) were more likely to identify strengths. Since the coded themes coincide with many of the professional skills assessed by the quantitative portion of the CPI, and since greater proportions of the comments identified activities associated with the coded units as strengths within the nontraditional student group, the comments support the findings based on quantitative data as reported earlier in this chapter.

Samples of the comments designated as strengths and areas needing improvement on the part of nontraditional students are provided in the remainder of this chapter. Because my primary interest in conducting this study was examine the effects of past work experience on clinical performance, comments regarding the strengths and weaknesses of traditional students are not quoted in this chapter; however, examples of these comments are provided in Appendix H. I described the most relevant knowledge, skills, and attitudes associated with each of the 16 themes. These descriptions are followed by quotations representing comments of strength and areas needing improvement. Although there are only a few comments presented for each category, it should be noted that there were many more positive comments than comments regarding areas needing improvement (See Table 10).
Table 10

*Strengths versus Need to Improve*

<table>
<thead>
<tr>
<th>Coded Themes</th>
<th>% Nontraditional Students</th>
<th>% Need to Improve</th>
<th>% Traditional Students</th>
<th>% Need to Improve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety/Safe</td>
<td>96.95</td>
<td>3.05</td>
<td>96.88</td>
<td>3.12</td>
</tr>
<tr>
<td>Responsibility/Responsible</td>
<td>100.00</td>
<td>0.00</td>
<td>90.48</td>
<td>9.52</td>
</tr>
<tr>
<td>Communication/Communicate</td>
<td>89.76</td>
<td>10.23</td>
<td>68.15</td>
<td>31.85</td>
</tr>
<tr>
<td>Documentation/Document</td>
<td>78.11</td>
<td>21.89</td>
<td>57.14</td>
<td>42.86</td>
</tr>
<tr>
<td>Cultural diversity/Sensitivity</td>
<td>100.00</td>
<td>0.00</td>
<td>86.36</td>
<td>13.64</td>
</tr>
<tr>
<td>Critical inquiry/Problem solve/Think/ Judgment</td>
<td>91.23</td>
<td>8.77</td>
<td>61.76</td>
<td>38.24</td>
</tr>
<tr>
<td>Screening/Examination/Examine</td>
<td>87.56</td>
<td>12.44</td>
<td>54.76</td>
<td>45.24</td>
</tr>
<tr>
<td>Evaluation/Evaluate/Goals/Plan</td>
<td>87.65</td>
<td>12.35</td>
<td>52.68</td>
<td>47.32</td>
</tr>
<tr>
<td>Treatment/Treat/Quality of care</td>
<td>91.95</td>
<td>8.05</td>
<td>55.88</td>
<td>44.11</td>
</tr>
<tr>
<td>Education/Educate</td>
<td>95.07</td>
<td>4.93</td>
<td>69.05</td>
<td>30.95</td>
</tr>
<tr>
<td>Service/Resource management</td>
<td>74.08</td>
<td>25.20</td>
<td>52.44</td>
<td>47.56</td>
</tr>
<tr>
<td>Consultation/Consult</td>
<td>97.83</td>
<td>2.17</td>
<td>75.00</td>
<td>25.00</td>
</tr>
<tr>
<td>Support personnel/Delegate</td>
<td>91.67</td>
<td>8.33</td>
<td>46.43</td>
<td>53.57</td>
</tr>
<tr>
<td>Professional/Social responsibility</td>
<td>100.00</td>
<td>0.00</td>
<td>85.04</td>
<td>14.96</td>
</tr>
<tr>
<td>Career/Life-long learning/Mature</td>
<td>100.00</td>
<td>0.00</td>
<td>57.14</td>
<td>42.86</td>
</tr>
<tr>
<td>Wellness/Fitness management</td>
<td>100.00</td>
<td>0.00</td>
<td>76.92</td>
<td>23.08</td>
</tr>
</tbody>
</table>

*Note: n=104 for Nontraditional MPT program; n=51 for Traditional MPT program*
Theme One: Safety and Safe

The skill concerning safety is a basic foundational skill that is defined as practice that “minimizes risk to patient, self, and others” (APTA, 1997, p.1). It is one that is considered a red flag item and warrants immediate contact of academic faculty if students do not show the appropriate level of competency to the clinical instructor (APTA, 1997). The majority of comments were very positive at the midterm and final; only a few indicated that the student continues to progress with their safety consciousness. The CIs explained that this need for further development was related to the complexity of the situation.

Comments of strength. “She has demonstrated good handling techniques when with patients. She is very aware of maintaining a safe environment … On one occasion she did not anticipate the patient’s reaction and yet no harm came to the patient. Clearly entry level!” (lines 2,210-2,213)

“Years of experience as a PTA have ensured safe patient care; no issues with safety.” (lines 12,759-12,760)

Areas needing improvement. “Continues to develop in this area. Is new to level one acute care and medical diagnosis conditions are complex.” (lines 2,856-2,857)

Theme Two: Responsibility and Responsible

The responsibility skill is another foundational skill that requires students to be accountable for their professional responsibilities (APTA, 1997, p.2). It is one of five skills that are considered a red flag item (APTA, 1997). One sub-theme that was noted with this particular skill was the level of independence that students exhibited with learning. Interestingly, there were no indications of any students requiring improvement in this area.
Comments of strength. “Always on time; is able to complete notes in a timely fashion; goes out of way to demonstrate initiative; is able to adapt to change and accepts responsibility for actions.” (lines 2,410-2,412)

“Very flexible to situational needs; of patient’s needs, of the Clinical Instructor’s schedule, and of facility demands. Very professional and responsible in this manner.” (lines 2,965-2,966)

“He is very willing to participate in self-learning – he initiates learning experiences (i.e.) balance program. He assess[es] own professional development on a weekly basis and is very responsible for following through on learning experiences offered. He demonstrates an awareness of his own strengths and limitations. He accepts responsibility for continuous professional learning.” (lines 14,152-14,156)

Areas needing improvement. None found for theme two.

Theme Three: Communication and Communicate

The communication skill typically requires time to develop especially with other health care professionals and with difficult situations (APTA, 1997, p. 6). Many of the comments concerning communication included a description of the students’ abilities to communicate in all possible forms and to all types of clients. It makes sense that the nontraditional students have many positive comments in this area because of their past experiences with communication in the clinical setting. I only found a few comments that indicated that the student needs to further develop communication skills at the midterm.

Comments of strength. “Entry level status has been achieved! I’ve seen communication done with all staff members from doctors to volunteers. I have seen her communicate in all mediums [media, such as] pager, e-mail, face/face, etc.” (lines 2,242-2,244)
“She has continued with excellent communication on this clinical [affiliation]. She has communicated with patients of all ages, [and] staff [such as] Clinical Instructors, support staff, and [other health care professionals] in meetings. She has modified her communication to be most effective with different audiences; has learned to/persuade difficult patients to participate. She has excellent techniques with children.” (lines 5,187-,194)

“He has especially shown quality [ability] with communication. He readily changes language and his style for professionals, doctors, or nurses and patients without medical knowledge or terminology. Perhaps even being a PTA, has helped him even more respect the verbal and non-verbal interplay between professionals.” (lines 15,709-15,712)

Areas needing improvement. “Occasional lack of communication with patient.” (line 3,012)

Theme Four: Documentation and Document

The documentation skill may require students more time to develop, especially due to the great variety of settings and requirements of third party payers (APTA, 1997, p. 7). Many of the CIs had had expressed that the students were performing at a high level with their documentation. Only a few CIs reported that the students need to further develop documentation skills and these comments tended to be very simplistic such as the legibility of writing.

Comments of strength. “Documentation is clearly within entry level! [The student] is very effective with documentation. Notes are easy to understand. All notes are relevant to patient care. Evaluation write ups are orderly and pertinent to patient needs. Documents clear plans so that when reviewing chart, you can understand what has been done.” (lines 2,435-2,438);

“Documentation is exceptional. She is very thorough and detailed. Her documentation is better than most physical therapists in the field.” (lines 8,163-8,164)


Areas needing improvement. “Need to improve hand writing.” (line 3,016)

Theme Five: Cultural Diversity, Sensitivity, and Differences

This theme was related to the CPI skill number 8 which is defined as, “adapts delivery of PT care to reflect respect for and sensitivity to individual difference” (APTA, 1997, p. 8). All of the CIs had expressed that the students were respectful and sensitive to their clients. This finding is logical because of the nontraditional students past experiences with clients in the clinical setting.

Comments of strength. “Respects and is sensitive to individual differences; shows no bias to gender, age or race when delivering treatment.” (lines 2,440-2,441)

“Demonstrates respect and compassion with patients of various backgrounds. He also communicates very easily with touch, an important non-verbal tool! He is very sensitive to patients needs on an emotional and physical level. He makes people feel important.” (lines 3,292-3,295)

Areas needing improvement. None found for theme five.

Theme Six: Critical Inquiry, Problem Solve, Think, and Judgment

Theme six was related to the critical thinking skill which is defined as, “Applies the principles of logic and the scientific method to the practice of physical therapy” (APTA, 1997, p. 9). Majority of the CIs had expressed that the nontraditional students were able to critically think at a high level. It may be that they were able to develop this particular skill because they quickly accomplished the foundational skills and therefore had more time to attend towards making clinical decisions.

Comments of strength. “Student applies principles of logic; is able to justify treatment methods and goals with knowledge and sound judgment; uses info from reliable sources to make
sure treatment methods will benefit patient to the maximal level; is able to make sound decisions in bizarre or ambiguous situations.” (lines 2,443-2,447)

“[The student] is definitely ahead of most new PT grads in the problem solving, patient education and documentation areas secondary to her PTA background.” (lines 3,209-3,210)

“[The student] is a rare blend of great social skills, excellent work ethic, and a mind that seeks out the highest level of science with progressive thinking.” (lines 8,003-8,004)

Areas needing improvement. “Needs to think through biomechanical pathologies.” (line 16,414)

Theme Seven: Screening, examination, and examine

This particular theme is a combination of two CPI skills, screening and examination (APTA, 1997, pp. 10-11). The majority of comments were very positive at the midterm and final; only a few indicated that the student continues to further develop screening and examination performance. The CIs explained that this need for further development was related to efficiency.

Comments of strength. “He knows how to perform tests well, he adjusts evaluations in response to patients; improved performance of subjective evaluations, objective evaluations, and treatment in a 45 minute time period. He modifies his evaluation according to patients’ response and is comfortable choosing and performing special tests to validate finding. He is truly right where he should be as a new grad. His evaluations are thorough. He obtains correct and appropriate information. He especially gathers an excellent subjective history at about 15 minutes.” (lines 3,316 to 3,323)

“She always screens her patients to determine appropriateness for physical therapy treatment; excellent screening skills.” (lines 13,334-13,335)
Areas needing improvement. “[The student] does a good job- technically does a good job. Could increase efficiency by testing one side completely before moving to other side. Efficiency has improved and she is better at planning her eval after asking for active first.” (lines 5,624-5,626)

Theme Eight: Evaluation, Evaluate, Goals, and Plan of care

Theme eight is a combination of two CPI skills, evaluation and plan of care (APTA, 1997, pp. 12-13). Both skills require an evaluation of the clinical findings to determine PT diagnoses, goals, treatment, outcomes, and discharge plans. Majority of the CIs gave comments that were very positive at the midterm and the final; only a few indicated that the student continues to further develop the ability to evaluate and develop a plan of care. The CIs explained that this need for further development was more related to evaluations of more complicated cases such as clients with burns.

Comments of strength. “Has been able to interpret clinical findings to establish a PT diagnosis and appropriate ICD 9 codes. He is able to evaluate changes in patient status and perform evaluations of effectiveness of patient treatments. He has also performed formal re-evaluations of patient’s status to decide if continuing treatment is appropriate or not. He continues to interpret clinical findings to establish PT diagnosis correctly.” (lines 2,596-2,600)

“He does an outstanding job of critical thinking, applying reasoning and evidence based practice to his caseload. He has extensive research with physioball training as it relates to muscle hypertrophy and has applied his knowledge to his lumbosacral patients. Every plan of care that he has established was done with sound clinical reasoning based on his solid differential diagnosing skills.” (lines 8,604-8,608)
“He has shown extraordinary talent in the area of evaluation and assessment. He synthesizes and seeks out additional info very well.” (lines 14,886-14,887)

Areas needing improvement. “[The student] has improved time spent with subjective and objective assessments, determining which areas to focus on. Will continue to increase ability to integrate information to guide evaluation strategies.” (lines 3,314-3,316)

“[The student] is learning how to complete evaluations on burn patients. She is very thorough with reviewing the chart. This is a very specialized evaluation.” (lines 5,223-5,224)

Theme Nine: Treatment, Treat, and Quality of Care

Theme nine is also a combination of two CPI skills, treatment and quality of care (APTA, 1997, pp. 14, 16). Both skills address the delivery of PT service, in particular interventions. The majority of the comments were very positive at the midterm and the final. Only a few indicated that the student continues to further develop in this area and it was more related to efficiency.

Comments of strength. “He demonstrates a good understanding of kinesiology that he applies very well in the outpatient setting for both ongoing evaluation and treatment. He is quick to question both his own conclusions and the conclusions of peers and referral services with deciding the appropriate diagnoses and treatments. I believe that any patient that entrusts him with their well being can do so justifiably. “(lines 2,732-2,736)

“She has been consistent in performance of treatment interventions. Her interventions have been consistent with the established plans of care.” (lines 3,494-3,495)

“She has demonstrated a willingness to go above and beyond expectations in order to provide service to patients in this clinic.” (lines 4,995-4,996)
“She has performed multiple PT interventions; is effective and creative with her interventions. She is not afraid to try multiple methods to maximize outcomes.” (lines 5,245-5,246)

“She is very competent in treating patients of many diagnoses without assistance from the Clinical Instructor. I would be very comfortable with her working on her own in this setting. She is comfortable treating complex/critically ill patients.” (lines 7,817-7,819)

*Areas needing improvement.* “She is becoming more efficient with treatment time available to achieve specific goals.” (lines 5,246-5,247)

“We use advanced manual therapy techniques at our office. Her hands are learning a great deal.” (lines 3,166-3,168)

*Theme 10: Education and Educate*

Theme ten is consistent with the education skill (APTA, 1997, p. 15). At the midterm and final the comments were very positive; only a few indicated that the student continues to further develop the ability to educate patients. However, this need for further development was more related to educating the more difficult or complicated cases.

*Comments of strength.* “She has been extremely successful in educating her patients by using a very straight forward and simple approach when explaining information. We have received multiple reports from patients concerning what they had learned under her treatment.” (lines 4,968 to 4,971)

“She takes the time to explain in detail and provide handouts to ensure follow-through. She makes sure the patient understands and can demonstrate the home exercise program. She does an excellent job with educating patients and families!” (lines 5,254-5,257)
Areas needing improvement. “[The student] is currently developing skills to deliver educational aspect of therapy especially to aim at the more difficult patient.” (lines 2,461-2,482)

Theme 11: Service and Resource Management

Theme 11 addresses the management of health-related services, departmental resources, and economic factors (APTA, 1997, pp. 18-20). Even though the number of comments was low, the majority was positive; only a few indicated that the student needs to continue to develop due to time management reasons.

Comments of strength. “[The student] continues to use resources effectively and efficiently.” (line 2,627)

“[The student] manages time and resources well. Good understanding of economic factors in delivery of PT services.” (lines 2,650-2,651)

Areas needing improvement. “He has improved time management.” (lines 3,251-3,252)

Theme 12: Consultation and Consult

Theme 12 was related to the consultation skill which is defined as, “Provides consultation to individuals, businesses, schools, government agencies, or other organizations” (APTA, 1997, p. 17). The CIs had reported that the nontraditional students were able to handle consulting with others, when appropriate. In contrast, many of the traditional students may not have been ready to work on this skill.

Comments of strength. “[The student] has shown the ability to identify situations in which consultation services would be appropriate. She is able to use her knowledge to assist others in the solving of PT related problems.” (lines 3,513-3,515)
“He was be able to handle administrative duties of PT, consulting with physicians, vendors, other health professionals etc. This was secondary to his previous experience, being a parent, and being a more mature student.” (lines 14,471-14,474)

“She has shown the proper ability to identify a need for consultation on orthotic and prosthetic concerns. She appropriately contacted these entities, with patient/family consent, and set up the consultation. She also demonstrates the ability to apply her PT knowledge to help PT related problems in our facility. She performs with absolute recognition of her boundaries within the scope of practice and when referrals/consultations are needed.” (lines 15,406-15,411)

*Areas needing improvement.* “This has developed with better identification of areas outside of more traditional practice settings in which people would benefit from consultation from a therapist.” (lines 3,516-3,518)

*Theme 13: Support Personnel and Delegate*

Theme 13 addresses the delegation of duties (APTA, 1997, p. 21). Even though the number of comments was low, the majority was positive; only a few indicated that the student needs to continue to develop.

*Comments of strength.* “[The student] is able to effectively use support personnel at appropriate times.” (line 2,722)

“[The student] demonstrates an outstanding understanding knowledge of work delegation to appropriate staff, PTA versus PT.” (lines 2,817-2,819)

“[The student] maintains good communication and a positive working relationship with transport staff. Also maintains very good communication with PTA . . . Because of his background, has a very solid understanding of the roles/responsibility of PTA vs. PT.” (lines 15,992-15,995)
Areas needing improvement. “[The student] has utilized transporters more effectively over past few weeks.” (line 15,993)

Theme 14: Professional and Social Responsibility

Theme 14 is a reflection of the CPI skill, professional and social responsibility. This skill addresses, “professional/social responsibilities beyond those defined by work expectations and job descriptions”(APTA, 1997, p. 22). All of the comments were very positive at the midterm and the final.

Comments of strength. “She has been working with a very difficult pediatric patient (medically and psychologically) and has maintained the utmost professionalism with all of her interactions with the patient and family, which is difficult to do.” (lines 2,867-2,879)

“She is extremely self-motivated as evidenced by her determination in completion of her program. She has assumed responsibility for her professional growth and development. I believe that her commitment to earning her degree demonstrates her personal strength and dedication to professional development.” (lines 3,728-3,731)

Areas needing improvement. None found for theme 14.

Theme 15: Career, Mature, and Life-long Learning

Theme 15 is related to the 23rd CPI skill, career and lifelong learning. This high level skill is defined as, “implements a self-directed plan for professional development and lifelong learning” (APTA, 1997, p. 23). All of the comments were very positive at the midterm and the final.

Comments of strength. “[The student] has made the transition from PTA to PT; so clearly has devoted self into lifelong learning; has also shown interest in continuing education; is motivated to pursue further advancements in skills; very eager to learn techniques to broaden own tool box.” (lines 2,519-2,523)
“Demonstrates a good awareness of her own strengths and limitations. She asks for guidance appropriately and evaluates her own performance. She is able to identify her own goals for learning during this placement and is forthcoming to share her own learning experiences. She reflects on her own development and current professional issues. [The student] is extremely keen, committed, and forward thinking regarding her own development and life long learning.” (lines 4,789-4,795)

“She is on a quest to continue to learn and broaden her clinical skills. She recognizes the importance of lifelong learning and the importance of being in a challenging work environment. She is very committed to lifelong learning and professional development.” (lines 13,388-13,391)

Areas needing improvement. None found for theme 15.

Theme 16: Wellness and Fitness

Theme 16 is related to the final CPI skill, wellness. This high level skill is defined as, “addresses primary and secondary prevention, wellness, and health promotion needs of individuals, groups, and communities” (APTA, 1997, p. 24). As was the case with the 15th theme, all of the comments were very positive.

Comments of strength. “[The student] does a good job in incorporating the concept of self responsibility in wellness and health.” (lines 3,558-3,559)

“[The student] promotes health and wellness of the entire client; understands that therapy and health is a holistic approach.” (lines 4,577-4,578)

Areas needing improvement. None found for theme 16.

As was found with the quantitative data, the number of comments designated as strengths were found to be higher for the nontraditional students. These results supported the findings of the CPI scores: nontraditional students may outperform traditional students in the clinical setting.
Clinical Instructor’s Questionnaire Results

In addition to the analysis of the CPI comment section, I chose to gather and analyze additional qualitative evidence from a third source, a questionnaire completed by clinical faculty in 2006 who had supervised both traditional and nontraditional students. This questionnaire began with several demographic items. Responses were summarized in describing the clinical instructors earlier in this chapter. Like responses in the comment sections of the CPI, responses to the three open-ended questions on the CI questionnaire were also analyzed for common themes.

The first free response item on this survey form stated, “Tell me about any differences that you have observed between the traditional student and the nontraditional PTA to PT student.” The responses reflected eight themes, including (a) interpersonal skills, (b) communication, (c) professional behavior, (d) documentation, (e) treatment skills, (f) problem solving, (g) supervision level, and (h) speed of progression. Out of the 17 clinical instructors who responded to the survey, many reported that the nontraditional students had higher levels of abilities than traditional students pertaining to interpersonal skills (four responses), communication (three responses), professional behavior (seven responses), documentation (five responses), and intervention skills (eight responses).

Three of these five categories are from the psychosocial domain. The CIs reported that the nontraditional students’ abilities gave them an advantage over the traditional students. For example, one clinical instructor explained, “People skills, the actual ability to work with patients is lacking many times with the traditional PT. The PTA to PT already has a comfort with this; it’s like second nature.” Another CI shared, “He was more relaxed and more comfortable interacting with staff, teachers, and parents.” Several reported that, “the PTA to PT students do
demonstrate more confidence; are more eager to start treating and getting hands on experience; and are more adaptable.”

The CIs further specified that the nontraditional students are stronger in their documentation and intervention skills. For example, one clinical instructor stated that nontraditional students, “have better documentation skills typically.” Many reported that the basic hands-on skills were most different between the two groups of students. “The increased skill level comes with basic hands-on like transfers, gait etc. with the PTA to PT students,” was shared by a clinical instructor. Another CI clarified that they, “have more experience with exercise progression as well as other treatment aspects which allows them to focus more on evaluation.”

Thirteen clinical instructors did not report a difference between the two groups in problem solving or critical thinking abilities. Two CIs reported that the nontraditional students had higher problem solving abilities than the traditional students. Both of these CIs had supervised multiple nontraditional students. One clinical instructor reported that the nontraditional students, “have much better problem solving, especially being able to rely on previous patient experiences.” Another response was that the nontraditional students have, “deeper thinking, which is great for our profession.”

There were also two instances in which the clinical instructors reported that their one experience with a nontraditional student was difficult due to the student being, “somewhat set in her ways, falling back on her previously learned standard treatments.” The student may have had difficulty, “seeing or accepting things that have changed over the last twenty years.”

The majority (15/17) of clinical instructors did not report a difference between the two groups in the degree of supervision. Only two clinical instructors suggested that there was a
difference in supervision level. One CI stated that nontraditional students required less supervision than the traditional students. In contrast, the second CI reported that she had only one experience with a nontraditional student who required, “more time and cueing.”

The majority (16/17) of CIs also did not report a difference in speed of progression. However, one CI offered that she has supervised multiple nontraditional students and found that they, “advance more quickly” with the learning experience.

The second free response item was, “Tell me about any similarities that you have observed between the traditional student and the nontraditional PTA to PT student.” The responses were categorized in five themes, including: (a) evaluation skills, (b) problem solving, (c) motivation, (d) confidence, and (e) supervision level. Eleven clinical instructors specified that both groups of students needed to develop their abilities to evaluate clients in a similar fashion. For example, one CI stated, “They all seem to function similarly in evaluation planning and school-based goal writing because it is unfamiliar to both types of student.”

There were three CIs who specified that both groups of students were similar with their problem solving abilities or “intelligence.” For example, a CI stated, “To tell you the truth in my experience I have not seen a difference in overall knowledge and problem solving.” This finding was consistent with the answers to the first question; the majority of CIs did not report a difference between the two groups.

There were also three clinical instructors who specified that both groups of students were similar with their motivation to learn. One CI reported that she had found both types of students to be, “self starters.” Another CI described both types of students as being, “very motivated and willing to learn.” The third CI stated that, “every student I have had has been willing to learn.”
Three clinical instructors discussed the need for both groups of students to develop their level of confidence. For example, a pediatric therapist explained, “both need help with confidence in most cases. They also need help with dealing with parents and patients at the same time in the pediatric setting.” Two of the CIs specified that both groups of students needed, “support during evaluations for confidence building.”

The clinical instructors also addressed supervision level with this question. Four CIs reported that both groups of students needed the same amount of supervision. For example, one CI stated that, “after the first few weeks, both types of students were similar in the amount of direction they needed.” This finding was consistent with the answers to the first question.

The third question addressed the reasons for the differences or similarities between the two groups of students. This question was, “Do you have any thoughts as to why the students have differences or similarities?” Three themes (i.e., personal maturity, life experience, work experience) were identified from the answers given to this question. There were two CIs who reported that the reason behind the differences between the two groups of students was the maturity level of the nontraditional students. In addition, two clinical instructors stated that it was greater life experiences that gave an advantage to the nontraditional students.

The majority of the CIs explained that it was specific work experience that had made the greatest difference. Twelve of the 17 clinical instructors identified the importance of experience with physical therapy. For example, one CI stated, “I think the biggest reason is experience in the field coming in. I feel that makes a big difference.” Another CI explained, “I think the PTA to PT students have had more clinical experience and therefore have more organization and a better feel for the flow of the clinic.” A third CI stated, “I think the nontraditional student has the
advantage from their previous experience. Their knowledge base is not just classroom or
textbook based, but real-life experience based.”

The results of this questionnaire provided some additional support for the findings based
on the CPI scores and comments. As noted earlier, the clinical instructors were able to identify
five areas (i.e., interpersonal ability, communication, professional behavior, documentation, and
intervention skill) in which the nontraditional students outperformed the traditional students.
They also found the two groups to be similar in five areas (i.e., evaluation skills, problem
solving, motivation, confidence, and supervision).

Even though they were able to identify some commonalities, the clinical instructors
reported that the two groups are definitely different. They identified three possible reasons for
these differences: (a) personal maturity, (b) life experience, and (c) work experience. The
majority of the clinical instructors agreed that past work experiences made the greatest difference
with the nontraditional students’ abilities in the clinical setting. Thus, the clinical instructors’
comments are consistent with the findings found from results of the CPI scores and comments. In
short, the nontraditional students generally had higher level of clinical performance than did
traditional students and, according to the clinical instructors, group differences favoring the
nontraditional students are largely due to their having had previous work experience in physical
therapy settings.
CHAPTER V. DISCUSSION AND CONCLUSIONS

Small but statistically significant differences between the two groups of traditional and nontraditional PT students were found in reference to several professional skills at both the midterm and final assessment period. All of these differences favored nontraditional students who had worked as PT assistants before entering the MPT program. At the final, these nontraditional students had significantly higher CPI scores on 12 of the 24 professional skills, designated by the APTA as being essential for entry level PTs. Although clinical performance scores for both groups of students increased from the midterm to the final, the degree of change in the majority of skills did not differ significantly for the two groups; both groups progressed in a similar fashion.

After finding a difference in the CPI scores between the two groups of students, I next chose to examine more closely the data concerning the nontraditional student group. There was an inspection of the relationship of clinical performance with three variables: (a) past experience, (b) grade point average, and (c) age. The majority of the CPI skills did not have a significant relationship with these variables. One skill, professional/social responsibility was found to be significantly related to GPA in a positive direction. And several other professional skills were found to have significant inverse relationships with each of the variables.

The qualitative data from the comment sections of the CPI and the CI questionnaire also pointed towards the conclusion that nontraditional students outperformed traditional students in the clinical setting. The clinical instructors further specified that this difference between the two groups of students may be related to the type of previous experience that the nontraditional students experienced. These results support the findings of the quantitative data, which also demonstrated a difference (weak, but significant) between the two groups of students.
Thus the results from all three sources (i.e., CPI scores, CPI comments, CI questionnaire) indicated that the nontraditional students had higher levels of clinical performance as compared to the traditional students. According to the clinical instructors, the past professional work experience may have facilitated this difference between the two groups of students. However, this study has several limitations that need to be considered, which are presented in the next section of this chapter. Chapter V also includes a summary of the findings, practical implications for the educator, and recommendations for future study.

Limitations

Generalizations

The most obvious limitation to this dissertation’s study is the use of a population that is only from one university and includes students from one type of a health care program, physical therapy. By having such a population, I am prevented from generalizing my findings to other health care programs. Although I can not generalize my results in this fashion, I can generalize to populations across the country because the students were from different states and had their clinical experiences back at their home towns.

In contrast, the advantage of having the data for four cohorts of students from one university is the consistency with the students’ academic education. For example, both the nontraditional and traditional students were exposed to the same mission and goals, policies and procedures at all levels of the organization, PT program’s curriculum and coursework, and academic and clinical faculty. One difference between the groups involved the scheduling of their clinical affiliations. The clinical experiences for the traditional students begin during the coursework stage of the program, whereas the nontraditional students complete their clinical affiliations following the completion of coursework. Ingram and Hanks (2001) found that the
timing of clinical experiences did not affect clinical performance, but that conclusion was not tested in this study. Nevertheless, it should be emphasized that the clinical performance assessed in this study was associated only with the final clinical affiliation completed by both groups following coursework and immediately preceding graduation. It should be noted that even though many extracurricular type activities and services are offered to both types of students, I have observed many more traditional than nontraditional students take advantage of those offerings. The extent to which these and other student experiences may have contributed to or detracted from student performance in the clinical setting can not be determined from this study.

**Clinical Instructors’ Rating Errors**

As was previously mentioned, the clinical instructors who evaluated the students received similar training and support from the university. Yet, there is the possibility that the clinical instructors had raters’ errors, biases, or other difficulties using the tool that may have affected their ratings of the students, which is another limitation to this study. A review of possible rating errors was provided in Chapter II. In addition to errors associated with the assessment process in general, the clinical instructors may have difficulty using *The Clinical Performance Instrument*.

As noted in Chapter III, directions for completing the CPI inform CIs that they must consider five different dimensions (i.e., quality of care, supervision/guidance required, consistency of performance, complexity of task/environment, and efficiency of performance), when assessing student performance in each of 24 skill areas. Within a given skill area, it may be that the student is performing higher in some dimensions than others. For example, a student may know how to complete a complex task and use the appropriate procedures consistently, but take an inordinate amount of time and need the assistance of the supervisor to complete the task. The CI most likely would score that student’s performance below entry-level, but the exact
placement on the visual analogue scale may depend on whether the CI values independence and efficiency more than complexity, consistency, and quality. Even though the CPI tool may be difficult to use and rating errors may occur, there is an assumption that all students had similar chances of being assigned to instructors who had problems using the CPI tool effectively.

One important aspect of utilizing this tool correctly is consistent observation of students and recording of their performance on the CPI for each skill. The CIs may indicate whether they had observed the students performance of each skill by checking a box labeled not observed on The Clinical Performance Instrument. For this dissertation study, significant differences were not found for the two groups with the not observed rating for all skills except one, consultation. This finding indicated that the clinical instructors were consistently evaluating all but one of the skills for both groups of students. It may be that the CIs chose to hold off on evaluating the consultation skill more often with the traditional students than the nontraditional students because they were not ready to work on this particular skill. However, it does appear as if the CIs were similar with their recording of skills performed by both groups of students.

In addition, the clinical instructors from both groups of students had recorded similar CPI comments, as indicated by the comparable themes. As previously mentioned in Chapter IV, the top four areas that the CIs commented on for both groups involved the following themes: (a) evaluation, evaluate, goals, and plan of care, (b) treatment, treat, and quality of care, (c) communication and communicate, and (d) documentation and document. This observation is another indication of consistency of evaluating skills performed by traditional and nontraditional students.
The Clinical Performance Instrument and the Ceiling Effect

A third limitation of this study is the ability to measure clinical performance of students during their final clinical affiliations and the resulting ceiling effect of CPI scores that occurred. To make appropriate comparisons, data were obtained from only the final clinical affiliation for both groups of students. At the midpoint it appeared as if the CPI scores were already quite high and there was not much room to advance on the visual analogue scale. See Appendix F for the clinical performance scores at the midterm. As listed in Appendix G, the CPI scores continued to be high for both groups of students by the final assessment period. The range of CPI scores for the nontraditional students was from 98.88 to 100.00 and for the traditional students the range was from 96.26 to 99.25. Hence, a ceiling effect of the CPI scores also occurred with the use of this tool for both groups of students during their final clinical affiliation.

Another limitation of The Clinical Performance Instrument (APTA, 1997) is the scoring of exceptional clinical performance that the clinical instructors could give students by checking the with distinction box. This scoring of clinical performance at an exceptional level is not a part of the visual analogue scale and therefore was not factored into the CPI scores. Although the manner of documenting exceptional performance is very clear for students, it does not allow for a complete analysis of clinical performance for the researcher because it is not a part of the visual analogue scale.

Statistical Procedures

The fourth limitation of this study involves statistical procedures that could or could not be used in analyzing some of the data that (a) lacked variability, (b) was read as missing, or (c) included a large number of variables. I first performed multivariate analyses of variance (MANOVAs) with the two sets of clinical performance skills (at the midterm and the final) and
found significant differences between the two groups of students. However, neither the MANOVAs nor the follow-up t-tests could utilize data concerning clinical performance that had no variability. For example, all of the nontraditional students had scores of 100 \((SD = 0)\) for seven skills (i.e., 1-6 and 8) and therefore the extent to which their scores differed significantly from the scores of the traditional students could not be determined.

In addition, when CIs did not check the boxes indicating exceptional or not observed performance, these variables were left blank in the data set and were read by the statistical program as missing data. Because many observations would not have been included in the analyses of these variables, data had to be recoded before group differences could be explored.

T-tests were used to determine whether observed differences in the mean performance ratings of traditional and nontraditional students were statistically significant. Because 24 skills were involved in this study and each was measured twice (at the midterm and at the final), a total of 48 t-tests were required. Although the alpha level was set at .05 and the sample size with data from a four year period was adequate, the large number of t-tests increased the chance of making Type I errors in concluding that the two groups differed significantly when they did not.

Various procedures such as the Greenhouse Geisser adjustment (Greenhouse & Geisser, 1959) could have been used to reduce the alpha to an appropriate level so as to minimize the probability of making Type I errors. However, these procedures were not used in this study. A concern in attempting to minimize Type I errors is that necessary procedures increase the probability of making Type II errors in concluding that group differences are not statistically significant when they are. To provide the reader with a clear understanding of the magnitudes of the significant differences found in this study, sample means and standard deviations for each of the two groups and effect sizes, as measured by the coefficient of determination or \(R^2\), for the
group differences were calculated. For the differences found to be significant at the $p < .05$ level, effect sizes ranged from .03 to .14, meaning that only between 3% and 14% of the variance in CPI scores may be attributed to whether students were traditional or nontraditional. The statistical power for the significance tests examining group differences ranged from .64 to .96, meaning that the tests had between a .64 and a .96 probability of detecting group differences (or rejecting null hypotheses of no group differences) when in fact they existed in the populations of traditional and nontraditional students. Essentially, very small differences in the sample means of traditional and nontraditional students were found to be statistically significant because other factors (i.e., sample size, alpha level, variability of scores) contributed to the power of the significance tests to detect even very small differences in their corresponding populations.

Summary of Findings

Taking these limitations in account, my findings still appear to indicate that the nontraditional students are different from the traditional students and these differences favor the student group with prior work experience. The main question to ponder next is what variable or set of variables have caused this difference between the two groups of students. The data from all three sources (i.e., CPI scores, CPT comments, CI survey) that were utilized in this study consistently indicated that the past professional work experience may be the variable that makes the difference. However, the amount of work experience that contributes to the clinical skills of MPT students may reach an optimum value, after which such experience loses its effect, or possibly has a negative effect, on student performance. Also, it is not known whether other factors such as student maturity or academic performance (i.e., age or GPA), either alone or in combination with work experience, may have contributed to the group differences found in this study.
Clinical Performance

The andragogy literature has extensively documented differences between traditional and nontraditional students (Caffarella & Barnett, 1992; Graham, Donaldson, Kasworm, & Dirkx, 2000; Knowles, 1984; Knowles, Holton, & Swanson, 1998; Knowles, Holton, & Swanson, 2005; Kolb, 1984). This study’s results have provided additional evidence for differences concerning clinical performance between these two groups of students. Even though the degree of significance was weak, differences concerning clinical performances were consistently found between traditional and nontraditional students.

Both at the midterm and the final, the majority of CPI scores for the nontraditional students were found to be slightly higher than the traditional students. See Appendix F and G for the CPI scores at the midterm and final, respectively. At the midterm, four of the 24 professional skills were found to be significantly higher: (a) communication, (b) evaluation, (c) treatment, and (d) education. I was surprised that only four skills were significantly higher because I had an expectation that there would be a greater number of group differences and larger group differences at the midterm than at the final. I assumed that the traditional students would be starting off much lower than the nontraditional students and by the end of the affiliation would catch up to the level of performance that the nontraditional students exhibited.

The findings, however, showed greater differences at the final than the midterm. The number of skills that were found to be significantly higher for the nontraditional students, tripled by the final. Those CPI skills were: (a) critical inquiry, (b) examination, (c) evaluation, (d) plan of care, (e) treatment, (f) quality of care, (g) consultation, (h) resource management, (i) support personnel, (j) professional/social responsibility, (k) career/ lifelong learning, and (l) wellness. Thus the null hypothesis, the clinical performance scores of traditional and nontraditional
students did not differ significantly at either the midterm or the final, was rejected for four skills at the midterm and twelve skills at the final, as the mean performances were found to differ significantly for the two groups.

The andragogy literature has been supportive of the positive effects of past experience on learning (Knowles, 1984; Knowles, Holton, & Swanson, 1998; Knowles, Holton, & Swanson, 2005). Some studies have specified that the nontraditional older students are better able to critically think or solve problems (Behrens, 1996; Halpern, 1996; James, 2000). Behrens (1996) and Halpern (1996) reported that critical thinking skills typically develop in time through an accumulation of life experiences. James (2000, p. 162) also specified that the students who had prior work experience, “adopted a deeper approach to problem solving.” As supported by these studies, this ability to critically think may have had an impact on the performance of professional skills, especially the students’ abilities to evaluate, develop plans of care, and consult with other health care professionals. I found this possibility to be supported by results of this dissertation’s study. At the final assessment period the CPI scores for four skills, (a) critical inquiry, (b) evaluation, (c) plan of care, and (d) consultation, were significantly higher for nontraditional students than traditional students.

Besides the evidence of good critical thinking skills, the professional literature provides some evidence that nontraditional students who were motivated to learn had excellent self-regulating behaviors, which could have a positive impact on academic achievement and clinical performance. Jacobson (2000) specified that self-regulating behaviors included the further elaboration and organization of new information, use of a variety of studying strategies, positive self-talk and coping skills, and assertiveness with getting instructor feedback. She stated that the more mature, nontraditional students who were motivated to learn typically exhibited these self-
regulating behaviors. If the nontraditional students in my study demonstrated such self-regulating behaviors, it would seem reasonable to hypothesize that they would have particularly strong performance in areas such as professional/social responsibility and career/lifelong learning. My research supports Jacobson’s supposition with findings that nontraditional students had significantly higher scores than traditional students for these and several other professional skills by the time they completed their final clinical affiliation.

As was previously mentioned, I expected a higher starting point for nontraditional students in comparison to the traditional students due to the requirement of at least one year of full-time work experience as practicing physical therapy assistants. In fact, this group of nontraditional students worked on average 6.4 years, with the range of 2 to 23. The literature concerning the importance of experience with learning substantiates my expectation (Argyris, 1982; Dewey, 1933; Hull, 1943; Knowles, 1984; Knowles, Holton, & Swanson, 1998; Knowles, Holton, & Swanson, 2005; Kolb, 1984; Thorndike, 1913; Schuetze and Slowey, 2002; Wilson, Teslow, & Osman-Jouchoux, 1995). In addition, most of the clinical instructors had informally reported better clinical performance on the part of students with previous experience versus those with no experience. However, this study’s results showed a greater number of CPI skills with significantly higher scores for the nontraditional students at the final than at the midterm. One possible explanation for this finding could be that the rate of learning increases for the more experienced group.

Another interesting finding from this study was that only two skills (i.e., evaluation and treatment) of the four that were found to be significantly higher for nontraditional than traditional students at the midpoint continued to be significantly higher at the final. The other 10 skills for which the nontraditional students had significantly higher CPI scores at the final were different
from those found to be significantly higher at the midterm. The majority of these 10 skills are more complicated skills that require higher levels of ability from the affective and cognitive domains of learning. Perhaps the nontraditional students were more prepared to move quickly up Bloom’s (1956) stages of learning. Another possible explanation would be that they already had the basic skills accomplished (from their PTA education and past work experience) and therefore had more time to devote to the accomplishment of additional, more complex skills like consultation.

*Degree of Change from the Midpoint to the Final*

As previously mentioned, the academic starting point was different for the two groups of PT students. The nontraditional PT students were at an advantage with associate’s degrees in PTA, which provided a solid foundation for basic physical therapy treatment skills. However, both groups had the same professional curriculum and coursework; only the means of presentation was different. The traditional group of students spent more time in the classroom and laboratory; the nontraditional group had greater online experience. Since all of the academic education for both groups was completed prior to this final affiliation, there was an assumption that there would be no difference in the final outcomes of the final affiliation. There was also an expectation that traditional students would have significantly greater increases in CPI scores between the midterm and final, and that they would *catch up* with the nontraditional students by the end of the clinical affiliation. However, group differences in the degree of change in the CPI scores from the midterm to the final were not significant for the majority of skills. Therefore, the null hypothesis, *the degree of change (from the midterm to the final) in the clinical performance scores of traditional and nontraditional students did not differ significantly*, was accepted for the majority of skills.
This null hypothesis was rejected for only two skills, since midterm to final changes for these two skills (i.e., education and treatment) were found to differ significantly for the two groups. In both cases, traditional students gained more than nontraditional students. Perhaps these two skills were chosen by the traditional students to accomplish by the end of the clinical affiliation. The clinical instructors may also have chosen to direct the students towards the accomplishment of these two very basic physical therapy skills. It does make sense that the students would need to accomplish these two skills prior to moving on to more advanced skills such as consultation. I only question why the traditional students did not have greater increases than nontraditional students in their performance scores for other skills. In particular, I expected to see greater change on the part of the traditional student group for other basic skills such as communication and safety.

**Exceptional Scores**

As previously mentioned in the section concerning limitations of the study, the results may have been affected by the tool itself due to a ceiling effect. There were a large number of nontraditional students, which had high scores at the midterm; all skills but seven had mean scores over 90.00 at the midterm. They continued to have high scores at the final with the lowest mean score of 98.88. Hence, there was not much room to indicate a change from the midterm to the final.

The CPI tool does have an indicator for *exceptional* abilities, above and beyond the 100% mark. This *exceptional* level of performance was not factored into the CPI scores that were obtained from the visual analogue scale. However, there was a recording of the number of *exceptional* marks for both groups of students at the midterm and final period. The analyses of such data showed that the nontraditional students were significantly more likely than traditional
students to receive exceptional scores at both points in time. Thus, the third null hypothesis, the total numbers of exceptional scores did not differ significantly for the traditional and nontraditional students at either the midterm or the final, was rejected. The finding that nontraditional students had proportionately more total exceptional scores provided additional evidence supporting the conclusion that nontraditional students outperform traditional students in the clinical setting.

Nontraditional students also had proportionately more exceptional scores on individual skills. At the midterm these skills were (a) safety, (b) responsibility, (c) documentation, (d) cultural diversity, (e) screening, and (f) treatment. With the exception of screening, these skills could be construed as basic foundational skills that were already developed through the students’ experiences as physical therapy assistants. These results appear to support the theory that past experience that is similar in nature to a new learning experience is most conducive to effective learning.

At the final, the nontraditional students also had significantly higher number of exceptional scores than the traditional students for eleven skills, which were (a) cultural diversity, (b) critical inquiry, (c) screening, (d) examination, (e) evaluation, (f) treatment, (g) quality of care, (h) service management, (i) resource management, (j) career/lifelong learning, and (k) wellness. Only two of the eleven skills were the same ones found at the midterm. As was previously mentioned, it appears as if the nontraditional students were able to quickly demonstrate entry-level performance with basic skills such as safety and responsibility and then move on to more advanced skills such as service management. These findings provide additional support for the positive building effect of past physical therapy assistant experiences on new learning experiences in the clinical setting.
Number of Not Observed Skills

It is possible that the clinical instructors were not evaluating the two groups of students in a similar way. Hence, there was an attempt to determine whether the CIs had a similar pattern of observation and recording of skills. The results of this study showed that there was no difference in the number of skills that were observed except for one skill, consultation. For example, at the final, this skill was not observed for 23% of the nontraditional students and 49% of the traditional students. Therefore, the null hypothesis, *the total numbers of not observed skills did not differ significantly for the traditional and nontraditional students at either the midterm or the final*, was accepted for all skills except consultation.

A possible reason for traditional students having an increased incidence of *not demonstrating* the consultation skill, as compared to the nontraditional students, could be that the situation needing a consultation did not occur. However, another explanation could be that the CIs may have chosen to *hold off* on assessing this particularly high level skill. They may have decided that their students were not ready to work on consultation because this skill requires the highest level of learning from the cognitive domain termed *evaluation* (Bloom, 1956). And yet the results seemed to indicate that nontraditional students were significantly more likely to be observed, and hence have an opportunity to be scored, on their ability to consult with other health care professionals.

Relationships with Work Experience

The higher CPI scores, the greater number of exceptional scores, and the greater likelihood of being observed consulting with colleagues all reinforce the idea that the nontraditional student group may have an advantage over the traditional student group with respect to performance in the clinical setting. Two questions still remain as to what variable or
set of variables caused this difference and to what extent that variable(s) affected the learning process in the clinical setting for the nontraditional student group.

The results seem to indicate that the past professional work experience may be the variable that makes the difference. There is some evidence that the more similar the past experience is to the new learning experience, the more successful the final outcomes (Adams & Hancock, 2000; James, 2000). However, the amount of work experience prior to returning to formal education may have a cut off point. It may be that after a certain period of time (e.g., 5 years), the work experience is no longer advantageous for students. There may be even a negative effect on the students’ clinical performance, especially in today’s fast-paced, ever-changing world whereby new skills and techniques are constantly being developed.

Through the analyses of all 24 CPI scores with past work experience only two skills, professionalism and examination, were found to have inverse relationships at the midterm. This finding of inverse relationships increased to eight skills at the final assessment period (i.e., documentation, examination, evaluation, plan of care, treatment, service management, resource management, and wellness). Thus, the null hypothesis, clinical performance scores of nontraditional students were not significantly related to the number of years they had worked as physical therapy assistants, was accepted for majority of skills. The null hypothesis concerning work experience was rejected with two skills at the midterm and eight skills at the final (as previously listed).

However, the removal of an extreme outlier (i.e., 20 years), resulted in only two skills having a continued degree of significance at the final: examination and documentation. Interestingly, the same two skills that were found to be inversely related to work experience were
inversely related to age. It may be that a combination of both variables may make an impact on clinical performance.

*Relationships with Cumulative Grade Point Average*

Besides a combination of variables, there may be other variables such as cumulative GPA that could affect the nontraditional students’ clinical performance. At the midterm, I found no significant relationships between the cumulative GPA and the CPI scores except for one skill, professional/social responsibility. A positive correlation was found, which meant as the students increased their GPAs, they were observed to have a higher sense of responsibility to their profession and society.

There were also no relationships found with 23 of the 24 clinical performance skills at the final except with one skill, education. This relationship was an inverse one whereby the nontraditional students with higher academic performances had lower scores for their ability to teach their clients. Therefore, the null hypothesis, *clinical performance scores of nontraditional students were not significantly related to the GPA*, was accepted for majority of skills. The null hypothesis concerning GPA was rejected only with the professional/social responsibility skill at the midterm and the education skill at the final. I am not certain as to why these types of relationships are indicated by the results of this study’s analyses. It could be that there are interactions of various factors that make a difference with the performance of certain professional skills in the clinical setting. For example, a sound understanding of theory concerning PT interventions (as measured by professional GPA) may be more important for the accomplishment of the treatment skill than for the communication skill.

The literature has shown mixed results concerning the relationship between academic outcomes and professional performance in the clinical setting. Although my study did not show a
positive relationship of cumulative professional GPA to clinical performance scores (except with professional/socials responsibility), there are studies that have shown academic performance to be positively related to clinical performance (Kai-Pei Tan, Meredith, & McKenna, 2004; Tidd & Conine, 1974; Watson, Barnes, & Williamson, 2000). For example, cumulative GPA from an OT program was found to be the best predictor of clinical performance for occupational therapy students in Kai-Pei Tan, Meredith, and McKenna’s (2004) study. Tidd and Conine (1974) also found a significant relationship between professional physical therapy GPA and clinical performance. A third study (Watson, Barnes, & Williamson, 2000), which supported the findings of both studies, was based on data (i.e., professional PT GPA) obtained from 118 PT graduates over a three year period of time and used the CPI as its evaluation tool.

In contrast, other research that is more supportive of my own findings showed minimal to no relationship between academic outcomes and clinical performance (Gross, 1999; Mann, 1985; Silver, B. & Hodgson, 1997; Thieman, Weddle, & Moore, 2003). However, it should be noted that variability in how academic outcomes were defined could have impacted the conclusions of these studies. For example, Gross (1989) defined academic outcomes as pre-professional GPA. Mann’s (1986) study utilized multiple measures to define the outcomes, including prerequisite course GPA, science GPA, and grades of several professional courses. The Thieman, Weddle, and Moore’s (2003) study used the professional physical therapy GPA. Finally, a fourth study analyzed the undergraduate academic outcomes (i.e., undergraduate GPA, Medical College Admission Test, and National Board of Medical Examiner’s scores, part one) of medical students and clinical performance (Silver, B., & Hodgson, C., 1997). Even though all four studies indicated that there were no significant relationships found between academic outcomes and clinical performance, conclusions must be made with caution due to the variability in defining
academic outcomes. Not only could these mixed results be due to inconsistent definitions of variables, they could be influenced by factors such as (a) the measurement tools being used to collect data that accurately represent clinical performance; (b) the evaluator’s abilities, attitudes, or biases; and (c) an interaction effect involving two or more variables. Limitations to these studies may be very similar to the limitations of my study, as discussed earlier in this chapter.

*Relationships with Age*

There is also some evidence in the literature that attributes advanced learning to greater life experiences, which occurs naturally with age (Ben-Peretz, 2002; Benor & Hobfoll, 1981; Kai-Pei Tan, Meredith, & McKenna, 2004). One study stressed the importance of time with learning as demonstrated by the following quote, “Learning from experience is a process and takes time. One has to experience failures.” (Ben-Peretz, 2002, p. 318). Another study determined that the students’ life experiences led to better clinical performance, which was defined by interpersonal skills and empathy (Benor & Hobfoll, 1981). However, this study compared students aged 21 to 24 years with students aged 16 to 20. They also looked at students above 24 years and did not find a significant difference. Kai-Pei Tan, Meredith, & McKenna (2004) reported that adult learners have better communication and interpersonal skills with their clients. In addition, their study did not find differences with other clinical skills.

Other studies have not shown a relationship between age and clinical performance (May, 1967; Thieman, Weddle, & Moore, 2003). Thieman, Weddle, and Moore’s (2003) study showed no relationship with age and clinical performance, attributing this lack of a relationship to the difficulty of measuring clinical performance. The results of both the Thieman et al. and May studies may have been due to the manner in which the variables were defined. I therefore
decided to explore this inconsistency concerning the relationship between age and clinical performance with nontraditional student group.

My study showed no significant correlation between age and the majority of clinical skills. However, a few skills were found to have small but significant negative relationships to age. At the midterm, six skills (i.e., professionalism, communication, cultural diversity, education, resource management, and career/lifelong learning) had weak inverse relationships with age. In contrast, there were only two skills, documentation and examination, that had weak inverse relationships with age at the final. With removal of the one outlier, the education skill at the midterm and the documentation skill at the final were no longer significant. Therefore, the null hypothesis, *clinical performance scores of nontraditional students were not significantly related to the age*, was accepted for majority of skills. The null hypothesis concerning age was rejected only for five skills (i.e., professionalism, communication, cultural diversity, resource management, and career/lifelong learning) at the midterm and one skill (i.e., examination) at the final.

The outcome at the final was that one skill, examination, had a weak inverse relationship with age. This skill, examination is primarily a psychomotor skill that requires the ability to think ahead with performing at the same time. It is difficult to say why the more experienced, older nontraditional students had lower CPI scores for examination. There may be a cut off point as to the amount of life experiences or degree of aging that could make a positive impact on clinical performance. This idea is indicated by the outlier who was found to be much older than the other nontraditional students in the group.
Additional Support for Past Work Experience

The qualitative data from the comment sections of *The Clinical Performance Instrument* provided additional support for the findings of the quantitative scores, gathered from the CPI of the nontraditional student group. Sixteen common themes were identified from the comment sections of the CPI, which were: (a) safety and safe, (b) responsibility and responsible, (c) communication and communicate, (d) documentation and document, (e) cultural diversity, sensitivity, and differences, (f) critical inquiry, problem solve, think, and judgment, (g) screening, examination, and examine, (h) evaluation, evaluate, goals, and plan of care, (i) treatment, treat, and quality of care, (j) education and educate, (k) service and resource management, (l) consultation and consult, (m) support personnel and delegate, (n) professional and social responsibility, (o) career, mature, and life-long learning, and (p) wellness and fitness. It is not surprising that these themes are very similar to, or closely related to, the individual skills that were being rated in *The Clinical Performance Instrument*. After all, the themes emerged from comments that clinical instructors were asked to make in reference to each of the 24 skills assessed in the CPI. However, this does not negate the finding that a greater proportion of the comments pertaining to nontraditional students (vs. traditional students) identified the professional skills as strengths.

The results of the questionnaire also endorsed the positive effects of past work experience. Many of the clinical instructors reported that the nontraditional students had higher abilities than traditional students. They specified the following areas as being demonstrated at a higher level most often: (a) interpersonal abilities, (b) communication, (c) professional behavior, (d) documentation, and (e) intervention skills. They reported that both groups of students from The University of Findlay demonstrated high levels of motivation to learn. They also reported
that both groups of students were similar with their need to work on evaluating clients, general problem solving abilities, and level of confidence.

Finally I was curious to find out what opinion that the clinical instructors had as to why the two groups of students were different. Three reasons were identified by the CIs, which were: (a) personal maturity, (b) life experience, and (b) work experience. They specified that these variables led to the clinical performance of the nontraditional students being at a higher than the traditional students. In addition, two clinical instructors stated that it was greater life experiences that gave an advantage to the nontraditional students.

The majority of the clinical instructors specified that work experience has made the greatest impact on clinical performance of the nontraditional students. They indicated that their knowledge was more “real-life experience based”, which allowed “a better feel for the flow of the clinic.” It could be that many of their cognitive abilities, psychomotor skills, and professional attitudes were already developed at a basic level. This advanced development for the nontraditional students with past PT experience may have allowed them to progress farther up Bloom’s (1956) stages of learning than the traditional students.

Implications

As previously indicated in Chapter IV, the data from three sources demonstrated that past professional work experience may make a positive impact on clinical performance. Hence, these results have implications not only for the physical therapy profession, but also other health care professions who perform similar skills as physical therapists. A more successful clinical performance may be indicative of high quality health care professionals and therefore, additional development of transition programs that utilize past professional work experience as a foundation for their curriculum may be warranted across all health care professions.
Not only is it important to offer high quality physical therapy programs, it is important to select the best candidates for those programs. Thus another recommendation would be for PT programs to utilize past experience as a part of their admissions process. There could be a ranking of the different types of experiences with the most similar to PT being ranked at the highest level.

Students with previous work experiences that are directly related to their professional studies may be more successful than other students in areas beyond clinical performance. For example, two studies found a positive relationship with past work experience and success in their programs (i.e., business and accounting, respectively listed), as measured by the cumulative GPA (Adams, & Hancock, 2000; Gracia, & Jenkins, 2003). Other studies demonstrated that students with higher GPAs significantly score higher on their state board examinations (Evans, Goodson, Schoffman, & Baker, 2003; Kosmahl, 2005; Nibert, Young, & Adamson, 2002).

In contrast, May (1967) did not find a relationship between past work experience and academic success of PT students. However, she defined the past work experience as a preadmission requirement for applicants to have exposure to any work environment post high school. Therefore, her results may have been due to how she defined work experience; the amount of experience may have been limited in time and depth. Dreher and Ryan (2000) also found no relationship with past work experience and academic performance for business students. They specified that the students had greater than five years of work experience.

The results of my study supported those studies finding no significant relationships between previous work experience and GPA in MPT or other professional programs. Only professional/social responsibility was positively related to GPA at the midterm and only education was negatively related to GPA at the final. All of the remaining 23 skills at the
midterm and the final were not significantly correlated with cumulative GPA in the MPT program.

Due to these mixed results, educators need to further explore what type and how much of a work experience would be advantageous for successful outcomes. Researchers found that just one year of past work experience had led to higher GPA in the final year of an accounting and finance program (Gracia & Jenkins, 2003). And yet others found no effect greater than five years of work experience (Dreher & Ryan, 2000). It may indeed mean that there is a cut off point for the amount of past work experience that would be of benefit.

Recommendations for Future Research

Future study could involve other universities to collaborate with determining whether past work experience does make a difference with clinical performance. By collaborating in this fashion, there could be generalizations made to all types of PT programs across the country. In addition, if the study involved other health care programs, I could generalize to those professions as well. After all, there are certain basic skills (e.g., communication and professional behavior) that are required in all health care professions. It would be interesting to see whether the results from my study would be replicated in other professional programs or health care settings.

It would also be interesting to determine exactly how similar the roles and responsibilities inherent in the PTA position are to those of the PT position. As previously mentioned, all members of the nontraditional student group had at least one year of experience as PTAs and therefore may have had a jump start on some of the more basic skills such as communication, education, and treatment. There are other more advanced skills (e.g., critical inquiry, evaluation, and consultation) that they may not have performed as PTAs, but may have observed being performed by PTs in their work place. Perhaps an identification of skills performed only or
predominantly by PTs would be helpful in further comparisons of the academic and clinical performance of MPT students with and without previous PTA experience.

Another recommendation would be to determine how much work experience would be advantageous for successful outcomes. It may be that after five years, no additional learning occurs or it leads to negative outcomes. For this type of investigation, the researcher needs to be exact with their definition of past work experience. For example, pre-professional volunteer type experience is certainly different than actual work experience in the professional clinical setting. Not only is it important to have a clear definition of past work experience, but there needs to be a good range of years of experience and depth of experiences related to the new learning situation.

Finally, I recommend the examination of the reasons behind the differences found between the two groups. The resulting differences may be due to other variables such as support systems or motivation level. It also may be due to a cluster of variables that usually occur with aging such as individual maturity level or general life experiences. Perhaps focus groups with semi-structured questions would be of benefit with such a study.

Conclusion

In conclusion, the higher CPI scores, the greater number of total exceptional scores, the greater the likelihood of being observed consulting with colleagues, and the proportionately higher number of positive clinical instructors’ comments from both *The Clinical Performance Instrument* and the CI’s questionnaire consistently indicated that the nontraditional students performed various clinical skills at a higher level than the traditional students involved in this study. Not only did the study’s results demonstrate differences between the two groups at both the midterm and final; they also revealed a similar rate of change for most of the 24 professional skills between the midterm and the final assessment period.
After examining the differences between nontraditional and traditional students, I explored the relationship between clinical performance and three variables: (a) work experience, (b) cumulative GPA, and (c) age. It should be noted that the analyses involved only nontraditional students, in part because all of the traditional students had zero years of work experience, all but two were 23 or 24 years old, and their mean cumulative GPA was 3.9 on a 4.0 scale. As a result of the range restriction caused by limited variability or no variability at all in these independent variables, it was extremely difficult or impossible to examine their correlations with the CPI scores of the traditional students. The correlation analyses that were conducted showed that work experience, GPA, and age were not significantly related to the vast majority of CPI scores for the nontraditional students.

My data suggested that there may be an optimum number of years of work experience that contribute to success in a professional programs in general and in a PT clinical setting in particular. Another explanation for the group differences found in this study is that independent variables not included in this study, alone or in combination with other variables, may have direct or indirect effects on student performance in the final clinical affiliation. Determining what such variables are and the extent to which they affect the clinical performance of MPT students requires further research. Knowing what contributes to the positive performance of MPT students in the clinical setting will allow professional program faculty, clinical supervisors, and students themselves to create conditions and engage in experiences that are most likely to foster future success as physical therapists.
REFERENCES


APPENDIX A

PERMISSION LETTER FOR CLINICAL PERFORMANCE TOOL
March 4, 2015

Deborah George, PT, MS
Bowling Green State University
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Bowling Green, OH 43403
Fax: 419-354-4216

APTA Request Reference: APTA 5445

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Sincerely,

[Signature]

Lori Doubart
APTA Director of Publications
March 1, 2005

APTA
Dept. of Publications
1111 N. Fairfax St.
Alexandria, VA 22314

Dear Ms. Lois Duckett,

I am a doctoral student in the Higher Education and Administration Program at Bowling Green State University (BGSU). The purpose of this letter is to request permission to refer to the Clinical Performance Instrument (CPI) as the tool utilized in my doctoral research study entitled, The Relationship of Past Experience and Clinical Performance.

The posted web document will only have a sample of one skill with the visual analogue (one page) from the CPI and the reference to which the complete tool may be found. The actual tool will be included with the manuscript that is submitted in the HSED department.

The document will include the following statement: The Clinical Performance Instrument may not be distributed without the permission of the American Physical Therapy Association (APTA), publications department. All inquiries must be directed to the APTA's Director of Publications.

I appreciate your consideration of my request. Please FAX back your reply at 419-434-4326. Thank you.

Sincerely,

[Signature]

Deborah Cerce, PT, MS

[Signature]

Carolyn Fisher, PhD, Chair of Dissertation Committee
APPENDIX B

SAMPLE PAGE FROM THE CLINICAL PERFORMANCE INSTRUMENT (APTA, 1997)
1. Practices in a safe manner that minimizes risk to patient, self, and others.

☐ Not ☐ M ☐ F ☐ Observed Novice Clinical Performance ☐ M ☐ F ☐ ☐ With Entry-Level Performance Distinction

SAMPLE BEHAVIORS
a) Observes health and safety regulations.
b) Maintains safe working environment.
c) Recognizes physiological and psychological changes in patients and adjusts treatment accordingly.
d) Demonstrates awareness of contraindications and precautions of treatment.
e) Requests assistance when necessary.
f) Uses acceptable techniques for safe handling of patients.
g) Protects welfare of self, patient, and others in emergency situations.

Significant Concerns: Check below if performance on this criterion places student at risk of failing this clinical experience.

☐ Midterm ☐ Final ☐

Midterm Comments:

Final Comments:

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APPENDIX C

COVER LETTER AND POSTCARD FOR QUESTIONNAIRE
Dear Clinical Instructor:

Enclosed is a questionnaire that will be used as a part of my doctoral dissertation research through Bowling Green State University. The purpose of my research is to describe the relationship between past professional experience and the clinical performance of physical therapy students. I hope to answer two main questions:

1. How do nontraditional students (those with full-time work experience as PTAs) perform as compared to traditional students in the clinical setting? And

2. Is there a relationship between the amount of past professional experience and successful clinical performance for nontraditional PT students?

The ultimate goal of the study is, of course, to improve physical therapy education for both traditional and nontraditional students so as to optimize the quality of care given in a variety of clinical settings by program graduates.

Participation in this research is voluntary; your completion and return of the enclosed survey will indicate your consent to participate. The questionnaire should take only about 15 minutes to complete. Please answer all questions as they pertain to your own experience with both traditional and nontraditional PT students. Then return the completed questionnaire in the enclosed stamped envelope. Responses will be kept confidential and reported only in a summary form. The information and insights provided by you and other clinical instructors will represent an invaluable contribution to this research.

If you have any questions or concerns about this questionnaire or the conduct of this research, you may contact me at 419-434-5531 or george@findlay.edu; my dissertation adviser, Dr. Carolyn Palmer, at 419-372-7383 or epalmer@bgsu.edu; or the Chair of the Human Subjects Review Board, Bowling Green State University, at 419-372-7716 or hsr@bgsu.edu.

Thank you for your participation!

Deborah George, MS, PT
Doctoral Student in HIED at BGSU

330 Education Building Phone: 419-372-7382 E-mail: hesa@bgsu.edu
Bowling Green, OH 43403-0244 Fax: 419-372-9382 Web: http://www.bgsu.edu/colleges/edhd/hesa
REMINDER

This is just a reminder to send back the questionnaire concerning the relationship between past professional experience and the clinical performance of physical therapy students. The information and insights provided by you will represent an invaluable contribution to my doctoral dissertation research through Bowling Green State University.

If you need another questionnaire or have questions, you may contact me at 419-434-5531 or george@findlay.edu. THANK YOU for your participation!

Deborah George, MS, PT Doctoral Student in HIED at BGSU
APPENDIX D

CLINICAL INSTRUCTOR’S QUESTIONNAIRE
Case #: __________

QUESTIONNAIRE

The purpose of this questionnaire is to describe the relationship between past professional experience and clinical performance of physical therapy students. Please complete the following questions as it pertains to your own experience with traditional and nontraditional students. It should only take about fifteen minutes to complete. This information will be kept confidential and only reported in a summary form.

Return the questionnaire in the enclosed stamped envelope. If you have any questions about this questionnaire, you may contact Ms. Deborah George at 419-434-5531.

A. Demographics

1. Gender: Male __________ Female __________

2. Age: __________

3. How many years have you been practicing as a physical therapist? __________ years

4. How many years have you been a Clinical Instructor (CI)? __________ years

5. Are you a credentialed CI? Yes__________ No__________

6. How many traditional students have you supervised in the past? __________ students

7. How many nontraditional students have you supervised in the past? ________ students

B. Open-ended questions

1. Tell me about any differences that you have observed between the traditional student and the nontraditional PTA to PT student.

2. Tell me about any similarities that you have observed between the traditional student and the nontraditional PTA to PT student.
3. Do you have any thoughts as to why the students have differences or similarities?

By sending this questionnaire in the enclosed envelope, you have agreed to participate in this study. THANK YOU! I appreciate your participation with this research study.
APPENDIX E

INSTITUTIONAL REVIEW BOARD APPROVAL LETTERS
August 21, 2007

TO: Deborah George
HIED

FROM: Richard Rowlands
FHSRB Administrator

RE: Continuing HSRB Review for Project HUSLU200K16

TITLE: The Relationship of Experience with Clinical Performance

This is to inform you that your research study indicated above has received continuing Human Subjects Review Board (HSRB) review and approval. This approval is effective August 28, 2007 for a period of 12 months and will expire on August 28, 2008. You may continue with the project.

Please communicate any proposed changes in your project procedures or activities involving human subjects, including consent form changes or increases in the number of participants, to the HSRB via this office. Please notify me at 419-372-1646, upon completion of the project.

Good luck with your work. Let me know if this office or the HSRB can be of assistance as your project proceeds.

Comments:

G: Dr. Carolyn Palmer
TO: Deborah George
HRRP

FROM: Richard Rawlands
HSRB Administrator

RE: Continuing HSRB Review for Project 505D050G165

TITLE: The Relationship of Experience with Clinical Performance

This is to inform you that your research study indicated above has received continuing Human Subjects Review Board (HSRB) review and approval. This approval is effective August 25, 2006 for a period of 12 months and will expire on August 25, 2007. You may continue with the project.

Please communicate any proposed changes in your project procedures or activities involving human subjects, including consent form changes or increases in the number of participants, to the HSRB via this office. Please notify me at 372-7718, upon completion of your project.

Good luck with your work. Let me know if this office or the HSRB can be of assistance on your project proceedures.

Comments:

C: Dr. Carolyn Palmer
August 30, 2005

TO: Deborah George

FROM: Richard Rowlands, PhD
HSRB Administrator

RE: Continuing HSRB Review for Project HC53058GF3

TITLE: The Relationship of Experience with Clinical Performance

This is to inform you that your research study indicated above has received continuing review and approval. This approval is effective September 14, 2005 for a period of 12 months and will expire on September 13, 2006. You may continue with the project.

Please communicate any proposed changes in your project procedures or activities involving human subjects, including consent form changes or increases in the number of participants, to the HSRB via this office. Please notify me at 372-7716, upon completion of your project.

Good luck with your work. Let me know if this office or the HSRB can be of assistance as your project proceeds.

Comments:

C: Dr. Carolyn Palmer
September 23, 2004

TO:          Deborah George
             HR/BD

FROM:        Richard Rowlands
             HSRB Administrator

RE:          HSRB Project No.: HU00506GE5

TITLE:       The Relationship of Experience with Clinical Performance

You have met the conditions for approval for your project involving human subjects. As of , your project has been granted final approval by the HSRB. This approval expires on September 15, 2005.

It is your responsibility to conduct the study as approved by the HSRB and to use only approved forms. If you seek to make any changes in your project activities or procedures (including increases in the number of participants), send a request for modifications immediately to the HSRB via this office. You may proceed with subject recruitment and data collection. Please notify me, in writing (fax: 372-4916 or email: herbd@bgnet.bgsu.edu) upon completion of your project.

Good luck with your work. Let me know if this office or the HSRB can be of assistance as your project proceeds.

Comments/Modifications:
The reviewers found that the conditions required for a waiver of consent for the 2005 cohort have not been satisfied.

Dr. Carolyn Palmer
Date: September 16, 2004

To: Deborah George and Carolyn Palmer (Advisor)

RE: Research Project

The relationship of experience with clinical performance.

The University of Findlay Institutional Research Review Board has completed its review of your project utilizing human subjects and has granted authorization. Please note that if any changes are made to the present study, you must notify the IRRB immediately.

Thank you very much for your cooperation. If you have any questions, please feel free to contact me at 434-6944 or email bouillon@mail.findlay.edu.

Sincerely,

Cindy E. Bouillon, PhD Chairperson
Institutional Research Review Board
1000 North Main Street
University of Findlay
Findlay, OH 45840

Cc: IRRB Office

Carolyn Palmer (Advisor)
APPENDIX F

CLINICAL PERFORMANCE SCORES AT MIDTERM
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APPENDIX G

CLINICAL PERFORMANCE SCORES AT FINAL
### Clinical Performance Scores at Final

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<td>Wellness</td>
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APPENDIX H

CLINICAL PERFORMANCE INSTRUMENT:

COMMENTS REGARDING TRADITIONAL STUDENTS
**Theme One: Safety and Safe**

*Comments of strength.* “[I] have not observed any occasions where they have practiced in unsafe manner.” (line 92)

*Areas needing improvement.* “[The student] needs to be more aware of body mechanics, take advantage of high/low tables. [The student is] not aware of basic contraindications for orthopedic conditions (e.g., THR precautions and avoiding terminal knee extension for ACL reconstruction and need[s] to guard patient - CGA [contact guard assist] with gain belt for unstable patients especially the first time you work with them.” (lines 9,595-9,599)

**Theme Two: Responsibility and Responsible**

*Comments of strength.* “[The student is] always on time and dependable with paperwork and clinic responsibilities; willing to be flexible with her schedule and caseload; is very professional. She continues to be flexible and is very responsible and dependable; assignments and paperwork are always done without reminders.” (lines 5,933-5,936)

*Areas needing improvement.* “She needs to show a little more initiative in setting up learning experiences after having list of available remind[ers].” (lines 6,817-6,818)

**Theme Three: Communication and Communicate**

*Comments of strength.* “He communicates well with patients and families and demonstrates excellent patience in challenging situations.” (lines 616-618)

*Areas needing improvement.* “[The student] sometimes uses slang terms during evaluations. [The student needs to] watch giving too complicated instructions.” (lines 18-19)
“[The student needs to] remember to maintain those skills in busier times and keep good eye contact. She has improved her communication skills.” (lines 1,341-1,342)

**Theme Four: Documentation and Document**

*Comments of strength.* “[The student provides] very complete yet concise documentation [is] done in timely manner, [and] uses languages that is technically correct.”

(lines 105-106)

*Areas needing improvement.* “[The student] needs more experience with computerized documentation.” (line 931)

“[The student] needs to improve documentation time to maximize time spent with patients.” (line 996)

**Theme Five: Cultural Diversity, Sensitivity, and Differences**

*Comments of strength.* “[The student] has had opportunity to interact with different ages and variety of disabilities. [The student] did well with communication with a client who had limited English.” (lines 108-109)

*Areas needing improvement.* “[The student] will continue to work on age-appropriate/disability specific treatments. [The student] continues to [need to] consistently develop plans of care appropriate to each patients and each situations.”

(lines 652-654)

**Theme Six: Critical Inquiry, Problem Solve, Think, and Judgment**

*Comments of strength.* “He shows good judgment in the clinic and the ability to be flexible.” (lines 908-909)

*Areas needing improvement.* “With more complex patients, she will be able to problem solve towards the correct diagnosis with outside guidance.” (lines 5,738-5,739)
Theme Seven: Screening, Examination, and Examine

Comments of strength. “[The student is] very thorough with objective screening/tests; able to assess/screen patients efficiently and with reliable measures.” (lines 964-966)

Areas needing improvement. “[The student] needs to obtain more information regarding medical history and how [the patient] functions everyday at home or work. [I] would like to see more special testing and [for the student] to check joint mobility.”
(lines 1,069-1,071)

Theme Eight: Evaluation, Evaluate, Goals, and Plan of Care

Comments of strength. “She identifies impairments and is able to establish reasonable goals, which take into consideration patient’s needs; does well at coming up with a suitable plan of care to facilitate improvement in her patients.” (lines 6,600-6,602)

Areas needing improvement. “[The student] selects appropriate tests and measures for data evaluation. But occasionally, [the student] will need prompting especially with more complex patient. Patient exam was improved/organized, flows better.” (lines 115-117)

“Interpretation of clinical findings in order to establish a PT diagnosis should continue to improve with experience. Don’t limit/minimize your vision as you evaluate. Always be ready to change gears of your 1st, 2nd, 3rd, etc. approach isn’t getting you the results you want.” (lines 6,392-6,395)

Theme Nine: Treatment, Treat, and Quality of Care

Comments of strength. “All interventions appear to be done in a competent manner [and] appears to be comfortable with these interventions. [The student] has demonstrated competence with all selected interventions and abides by plan of care.”
(lines 1,183-1,185)
Areas needing improvement. “Keep improving your skills with initiation and with your knowledge with modalities.” (lines 85-86)

Theme 10: Education and Educate

Comments of strength. “[The student] has worked on education of patients with gait activities, transfers, bed mobility, stairs and wheelchair mobility [and] has also worked with families on patients’ educational needs. [The student needs to] continue with this next few weeks. Great job at ongoing education of patients, families, etc.! [The student] documents education appropriately; appropriate for those he is teaching.” (lines 862-866)

Areas needing improvement. “[The student] has also worked with families on patients’ educational needs [and] need to continue with this, the next few weeks.” (lines 863-864)

Theme 11: Service and Resource Management

Comments of strength. “[The student] seems to have good understanding of community resources, programs available to pediatric parents.” (lines 581-582)

Areas needing improvement. “[The student is] improving time management [skills] with regards to patients.” (line 6,902)

Theme 12: Consultation and Consult

Comments of strength. “[The student] was able to spend a day with a prosthetist/orthotist helping her identify problems among her patients that may be best addressed by a consult of this particular service. Also [the student] is able to determine needs that may need to be addressed by a physician.” (lines 6,630-6,633)

Areas needing improvement. “She does require some guidance in that decision at this time. [The student] is able to determine if a patient may require further intervention such as seeing a specialist for a consult or having an MRI.” (lines 5,728-5,729)
Theme 13: Support Personnel and Delegate

Comments of strength. “[The student] functions well with PTAs and understands services which can be delegated and is respectful of all support staff. [The student] does well in assisting and supervising PTA’s as well as PTA students and understands the role of all support personnel in our setting.” (lines 1,210-1,212)

Areas needing improvement. “She needs to work on her comfort level with contacting [medical] offices, as well as informing PTA of what activities to perform next.” (lines 5,802-5,804)

Theme 14: Professional and Social Responsibility

Comments of strength. “She has many strengths that will make her a good clinician. Her professionalism is above entry level.” (lines 6,038-6,039)

Areas needing improvement. “[The student] shows need to continue to develop professionally.” (line 6,923)

Theme 15: Career, Mature, and Life-long Learning

Comments of strength. “[The student] routinely documents further needs and opportunities of further growth. [The student] recognizes the need for ongoing education.” (lines 146-147)

Areas needing improvement. “[The student] really has improved in many ways. I would only suggest to her to continue seeking out learning opportunities to continue to increase knowledge and skills.” (lines 6,042-6,044)

Theme 16: Wellness and Fitness

Comments of strength. “[The student] addresses wellness with individual patients.” (line 149)
Areas needing improvement. “She is beginning to educate patients and their families on preventative techniques and activities to improve wellness. She requires more experience in this area.” (lines 7,118-7,119)