A CORRELATION STUDY OF PROFESSIONAL DEVELOPMENT PERCEPTION AND
SCHOOL ACHIEVEMENT IN NORTH CAROLINA

by

Kevin Charles Popadines

Liberty University

A Dissertation Presented in Partial Fulfillment
Of the Requirements for the Degree

Doctor of Education

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ABSTRACT

Adult learners have distinctly different needs and motivations compared to those of children. These needs and motivations need to be kept in mind to help ensure meaningful and successful learning experiences in professional development offered to educators. The purpose of this correlation study is to determine if the perceptions educators have of the professional development they receive had a statistically significant relationship to the school achievement within their North Carolina public schools. The educator perceptions regarding professional development were measured by using the North Carolina Teacher Working Conditions (NCTWC) Survey. School achievement was measured by the school performance grade score. A random sample of 348 schools representing 116 districts in North Carolina participated in this study. Pearson product-moment correlations were calculated via SPSS 23 to test the three null hypotheses in order to assess the direction and strength of any possible relationship between educator perception of professional development and school achievement. The data analysis failed to yield any statistically significant correlation between the two variables. Although this analysis did not show a significant correlation, this research adds to the present body of literature and offers ideas for future research.

*Key words:* Adult learner, educator perception, professional development
Dedication

This dissertation is dedicated first and foremost to my wife, Lauren Popadines. Lauren has given unyielding support to the countless hours I have dedicated to my coursework and writing. She has supported job changes and moves in order to allow me opportunities to affect change in education. She continues to be my love, inspiration, and rock as we have gone through this difficult journey.

I would also like to dedicate this dissertation to the students I left behind when I left the classroom. Teaching has brought great joy and satisfaction into my life. I thoroughly have enjoyed making a direct impact on students’ lives. Building relationships with students and helping them on their journey is a rewarding part of being an educator. Leaving the classroom in order to affect change from a different level was a difficult decision. Part of that decision included gaining as much knowledge and extending my education as far as I could so I could make as big of an impact on as many students and families as possible. Completing my Doctorate is a large part of that promise. Continuing my pursuit of education in order to better help those I work for and with is important to me and vital to help realize goals. I miss my students but honor them and their hard work with hard work of my own.
Acknowledgments

I would like to take the opportunity to acknowledge my parents, Charles and Donna Popadines. My parents have been a constant support and source of inspiration in my life. They provided me with all of the love, support, and motivation to be the best that I can be. My parents gave me every opportunity to be successful in this world and the encouragement to push myself beyond what I thought I was capable of. I do everything in my life to make them proud. I appreciate all they have and continue to do for me and hope this accomplishment is a small way to thank them.

I would also like to take the opportunity to acknowledge my committee and consultant. My committee chair, Dr. Alan Wimberley has been an incredible source of knowledge, encouragement, and inspiration on this journey. I am thankful to have been able to have the opportunity to work with such a brilliant and inspirational man. Dr. Henry Dorr made an instant, positive impression on me during the first week of his class which I took early in my coursework. I am honored to have him on my committee and thankful for the time he invested in me. Dr. Samantha Kay made a positive impression on me the first time I met her and she has served as a motivating factor to join her in holding a terminal degree. I am honored to have her as a colleague and friend. I am thankful to have had the chance to work with her on my dissertation. Finally, I would like to thank Dr. Meredith Park, my consultant. While I have only worked with Dr. Park for a short period of time, her advice and counsel have been integral in my success. Thank you all for your hard work, good counsel, and belief in me throughout this journey.
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List of Abbreviations

End-of-Course Tests (EOC)

End-of-Grade Tests (EOG)

Education Value-Added Assessment System (EVAAS)

Institutional Review Board (IRB)

North Carolina Teacher Working Conditions Survey (NCTWC)

Professional Development (PD)

School Performance Grade (SPG) Score

Teaching, Empowering, Leading, and Learning (TELL) Survey
CHAPTER ONE: INTRODUCTION

Overview

“A bad strategy will fail no matter how good your information is. And lame execution will stymie a good strategy” (Gates, 1999, p. 4). One should not doubt best intentions with regard to continued development for teachers in the United States. A greater look into strategies and execution may help the system understand why results do not always reach desired outcomes. Chapter one of this dissertation contains the following sections and information. The background presents a look at costs and results of our educational efforts in the United States, the importance of professional development, a history of the North Carolina Teacher Working Conditions Survey, a connection between working conditions and student learning, and concludes with a summary of adult learning. A problem statement is then presented showing why literature has not fully addressed the main focus of this study. The purpose statement will then share with the reader how this problem will be addressed. The significance of this study will serve to clarify how this research will add to the present body of knowledge on this topic. This chapter is concluded with a research question and list of definitions.

Background

Professional development (PD), is an integral part of any school system. It has been estimated that in 2014, $18,000 was the average amount of money dedicated to each teacher’s improvement annually (McGovern, McGovern, & McGovern, 2015). Furthermore, the same source states that this accounts for an average of between 6% and 9% of the total budget for school districts. With such a great investment being made for teachers and their improvement, it would stand to reason that schools and students would thrive when teachers are given this high level of support. One data point that allows longitudinal comparisons of the United States’
national progress every three years and a comparison against other countries in the world is the Programme for International Student Assessment (PISA) exam. Based on 2015 results, the United States dropped 11 points in mathematics while remaining stagnant in reading and science when compared to the 2012 results (Jackson & Kiersz, 2016). Furthermore, the US ranked 40th, 24th and 25th in mathematics, reading, and science respectively out of the 72 participating countries. While this is only a snapshot of 15-year-old students, it underscores a lack of growth and progress with regard to academic achievement in our nation’s schools.

PD is a major and often the primary platform for professional learning amongst educators. Topics presented in PD vary by state, district, school, and can even vary by grade level within a school. Topics may relate directly to school improvement plans and goals, be the result of a needs assessment, or mirror areas that are a focus in current educational research. Professional development is a vital tool for improving success in schools. Professional development is seen as the only tool districts have to strengthen educator performance levels and the only way educators can learn in order to raise student performance levels (Mizell, 2010). Informed and inspired teachers affect student achievement and the proper staff development is the key to realizing this (The Importance of Staff Development: Three Imperative Workshops for Teachers, 2010). While the importance of PD is clear, it was found that experimental studies relating aspects of PD and student outcomes are both necessary and lacking (Glover et al., 2016). Pairing the importance of PD with the stagnant PISA results begs the questions, what is going wrong with America’s approach to professional development and why is it not more effective?

Effective professional development that involves inquiry should enhance an educator’s knowledge and improve their practice (Capps, Crawford, & Constas, 2012). Professional development is a process where teachers want to be involved, desire something to be content
specific to them, and incorporate instruction on teaching strategies (Lucilio, 2009). Professional development while being designed, needs to focus on doing a better job of addressing motivations and needs of the adult learners (Caddle, Bautista, Brizuela, & Sharpe, 2016). Teachers’ needs and motivations vary and thus the incorporation of adult learning through andragogical principles is vital for professional development to be well received by teachers as well as be deemed effective.

Various working conditions measurement instruments exist with some taking how teachers perceive professional development into account. North Carolina utilizes a working conditions survey with a large emphasis on professional development. The North Carolina Teacher Working Conditions (NCTWC) Survey was developed and refined between 2002 and 2008 as part of the Governor’s Teacher Working Conditions Initiative. This instrument, also known as the New Teacher Center’s Teaching, Empowering, Leading and Learning (TELL) Survey, has been administered in North Carolina every other year beginning in 2002 (New Teacher Center: TELL Resource Library, 2017). This tool which is administered by the North Carolina Department of Public Instruction, is used as an evaluation artifact for both educators and administrators as well as a component of school and districts plans which can impact professional development decisions (North Carolina Teacher Working Conditions: About the North Carolina Teacher Working Conditions Survey, 2016).

The NCTWC is an important tool as working conditions have been linked to student achievement and performance. A study, completed in 2009, found that teaching and learning conditions can predict student mathematics achievement and also, but to a lesser degree, reading achievement (Ladd, 2009). A 2011 study found that positive working conditions were a factor in improved student achievement (Johnson, Kraft, & Papay, 2012). Another study, using TELL
data, found that teachers working in a more supportive environment had greater rates of increasing test scores as opposed to teachers working in a less supportive environment (Johnson et al., 2012). An additional study, using TELL data from 2012, found that four areas of the survey; student conduct management, demands on time, professional autonomy, and professional development, were significant predictors of student value-added gains (Kane, Kerr, Pianta, Ferguson, & Hirsch, 2014).

Adult learners have unique needs and motivations. Andragogy is the primary adult learning theory. The six adult learning principles of andragogy are: the learners’ need to know, self-concept, prior experience, readiness to learn, orientation to learning, and motivation to learn (Knowles, Holton III, & Swanson, 2015). This six-part andragogy model, which was derived from the previous four and five-part models of adult learning, outline the tenants that help lead to meaningful learning in adults. While andragogy is classified as a learning theory, the work of Knowles is related to other works and has stood the test of time and criticism. Adult learning was initiated by Thorndike’s scientific stream and Lindeman’s artistic stream. During the 1950’s, adult education was studied and researched by the social sciences. Contributions to the body of research pertaining to adult learning were added by educational theorists including Freud, Jung, Erikson, Maslow, and Rogers (Knowles et al., 2015).

While pedagogy and andragogy are related, there are important distinctions that need to be highlighted. Pedagogy, which is designed for the teaching of children, gives all decision-making power to the teacher (Knowles et al., 2015). The pedagogical model does not include andragogical assumptions, while the andragogical model includes pedagogical assumptions. This can be seen by looking at six pedagogical assumptions about learners: learners need to know that they must learn what teachers need them to know to pass, a teacher’s concept of the
learner is a dependent personality, experience is of little worth, readiness is based on what a teacher determines is needed for passing or promotion, orientation is based on subject-centered learning, and learners are motivated by external factors. Without oversimplifying the complex field that is andragogy, much of adult learning is based around a desire to learn and allowing a choice in what the adult finds value in learning. One can see that foundational differences between pedagogy and andragogy revolve around choice and desire. Those who enter into education are typically taught the fundamentals of pedagogy through their undergraduate and graduate programs. These same educators go on to rise into positions in administration and district positions often becoming the developers and deliverers of much of the staff development that takes place in this nation’s schools. When professional development is dictated and chosen for teachers it often mirrors pedagogy and goes against best practices for adult learners. This problem is further compounded by any creators and deliverers of PD who lack formal education and training in adult learning principles.

**Problem Statement**

The problem of this study was that while professional development is a feature of all school institutions and studies do exist regarding PD, there is a lack of quantitative studies focused on educator perceptions about professional development and student achievement. It was concluded that experimental investigations into aspects of PD and student outcomes are needed (Glover et al., 2016). A literature review revealed that no reported study exists that links inquiry PD and enhanced student outcomes (Capps et al., 2012). Finally, a study found that there is limited research available regarding secondary education related to linking professional development and improving teaching and learning for all students (Lucilio, 2009). A clear gap
in the literature exists regarding correlating educator staff development perceptions to any possible connection to student achievement.

Working conditions are linked to student achievement. More specifically, links have been made between specific working conditions and student value-added gains. Value-added gains look at not simply how a student is learning at a fixed point in time but more specifically how a student learns over a defined time period (Kane et al., 2014). While overall working conditions show a correlation to gains, working conditions are a broad topic that look at many aspects and areas of the complex systems that take place in schools. Narrowing that topic down from multiple factors to look specifically at one, namely professional development, is an important and necessary study. Taking a focused look at a working condition centered on professional development, and to determine if a correlation exists with student achievement, will help to solve this problem. The problem being investigated is a lack of focused attention to the potential correlation between the working condition of staff development perceptions of teachers and school achievement.

**Purpose Statement**

The purpose of this quantitative correlation study was to determine if there exists a relationship between the predictor variable, educator perceptions of professional development as measured by the North Carolina Teacher Working Conditions Survey and the criterion variable, school achievement in North Carolina Public Schools as measured by North Carolina’s School Performance Grade (SPG) Score. By comparing the professional development portion of the working conditions survey from randomly selected schools in North Carolina to their school performance grade score, the existence of and strength of a possible correlation can be
calculated. This calculation can determine the strength and direction of any relationship that may exist.

**Significance of Study**

Professional development can be defined as: the teaching and learning experiences designed to improve skills, knowledge, and dispositions in an effort to better provide high-quality educational experiences for the students and teaches (Snyder et al., 2012). With the focuses of many professional developments linked to school improvement plans, PD ultimately is related to school and student achievement. This relationship is understood to allow PD to serve as the vehicle through which improvement can occur. However, with the majority of professional developments being dictated for educators, as opposed to following the constructs of andragogy, adult learners’ needs are not always being met by professional development offerings. Within school districts, PD may be designed, delivered, or both by colleagues whose educational background was primarily focused on elementary or secondary learners. These adult students require andragogical constructs as opposed to pedagogy. Going back to evaluate whether or not the methods and theories with which PD was designed and delivered would prove to be exhaustively cumbersome. Yet perception of that PD from the teacher learners may offer some answers as to whether or not it met their needs.

Studying a possible relationship between how adult learners perceive the professional development they take part in and student achievement is a gap in literature that needs attention. While the work of Ferguson and Hirsch (2015), found a relationship between four areas of the TELL survey, including professional development and student value-added gains, studying a correlation between professional development and overall school achievement is a necessary area that has yet to be explored. Due to the unique learning tenants of adults, having the majority
of professional learning determined for them with little to no choice goes against andragogy principles and may affect the desired outcome of such learning experiences. Perception and any possible correlation it has to achievement, may highlight the failure of the educational system to recognize the importance of adult learning theory at any stage of development: plan, design, and delivery of most PD. This study helped to determine if a correlation exists and can in turn lead to future studies on how to address any such issues and implications. Furthermore, results may also serve as a reflective opportunity for those who create, deliver, or choose professional development opportunities for the nation’s educators.

**Research Question**

RQ1: Is there a relationship between the educator perceptions of professional development and school achievement in North Carolina public schools?

**Definitions**

The following terms and their definitions will help to bring clarity to the main areas of focus in this study.

1. **Andragogy**: A set of the following six adult learning principles: the learner’s need to know, self-concept, prior experience of learning, readiness to learn, orientation to learning, and motivation to learn (Knowles et al., 2015).

2. **Pedagogy**: The art and science of teaching children (Knowles et al., 2015).

3. **Professional development (PD)**: Professional development (PD) can be defined as the teaching and learning experiences designed to improve skills, knowledge, and dispositions in an effort to better provide high-quality educational experiences for the students one works with (Snyder et al., 2012).
CHAPTER TWO: LITERATURE REVIEW

Overview

Chapter Two of this dissertation explores theory and literature related to this study. This chapter begins with Knowles’ adult learning theory, andragogy, and how it highlights assumptions regarding why and how adults learn in a unique manner as well as how to best meet their educational needs. This unique manner of learning also illustrates why professional development that does not take the six foundational assumptions of andragogy into account may not be as effective as desired. This chapter continues with related literature. This begins with an introduction to professional development, continues with the importance of professional development, and is followed by evaluating traditional and non-traditional professional development. The related literature continues with expectations and effectiveness of professional development, then examines high quality professional development, and continues with teacher working conditions, and various connections they have to teacher perceptions, adult learning, and the desired outcomes of educational professional development. This chapter concludes with a summary.

Theoretical Framework

Adult learners function fundamentally differently than child learners. Assuming that adults, specifically those in the field of education, learn the same as the students they teach and interact with on a daily basis is a misguided and counterproductive assumption. Malcolm Knowles originated the theory of andragogy in the early 1970s. The adult learning theory of andragogy has evolved over the years beginning with four assumptions and is now based on the following six: the learners’ need to know, self-concept, prior experience, readiness to learn, orientation to learning, and motivation to learn (Knowles et al., 2015). These assumptions
closely mirror Lindeman’s four assumptions about adult education although there is not any evidence this is where Knowles originated his theory. Motivation to learn, the sixth assumption was added to some works in 1984 and has been included in all works since 1989. While the first assumption, the need to know, was added in 1984. Andragogy, in its simplest form can be described as an art and science designed and dedicated to helping adults learn (Ross-Gordon, 2003).

The six principles of the andragogy model help to define what makes adult learners unique as well as help to show why intentionally planning, with a focus on adult learning, is a critical need when examining teacher perception of professional development. The need to know is centered on the idea that adults first have a need to understand why they are going to learn something before they begin to learn (Knowles et al., 2015). This first assumption is critical to andragogy and this study. Professional development is often delivered as time allows and as mandated from school, district, or state sources. If not properly framed and introduced, the first of Knowles’ assumptions can easily be overlooked which in turn could adversely affect the effectiveness of the learning experience and overall outcome.

To help better meet this first assumption it is becoming more widely recognized that adults need a larger role within the planning, and facilitation of their learning (Knowles et al., 2015). Shared control over the process of learning is important to the adult learner and must be incorporated if positive results are desired. This process of shared control allows for collaboration and a partnership yielding a positive working environment. This first assumption is described through three dimensions; the need to know how the learning will take place, what learning will occur, and why this specific learning is important. A lack of collaboration and partnership will fail to allow this important principle to be met.
The learner’s self-concept refers to having a choice. Adults have a need to be seen as capable of making a choice (Knowles et al., 2015). Young students who follow a pedagogical model are often told which classes they will take each year and what they will learn in those classes. Being a child does not allow for an abundance of choices in life nor education. Adults however, have a need for responsibility regarding their own decisions, both in life and their education. Unfortunately, professional development is often mandated for teachers. Choice is eliminated and a one-size-fits-all professional development is presented with attendance and participation required. This goes against Knowles’ idea of the learners’ self-concept yet is a common practice in the nation’s schools and school systems.

A study by Blondy, found that while adult learners desire self-direction in their learning and learning activities, there may be a lack of available and necessary resources for some teachers to function completely independently (Blondy, 2007). This idea presents a difficult paradox in that adults need choice but may have obstacles in realizing that choice. This raises an imperative point about the access that teachers have to the learning opportunities and resources needed for growth. With limited funds, time, and expert help, choice is not always possible yet is still a crucial element for adult learners.

It is important to understand what self-directed learning is and how it is defined. There are two conceptions of self-directed learning that appear to be commonly researched and understood in literature (Knowles et al., 2015). The first of these conceptions views self-directed learning as self-teaching. This can be understood as an adult learner teaching himself a concept or subject while being the one who controls all mechanics and techniques of said instruction. The second conception of self-directed learning is autonomy in the learning such that the learner has ownership of their learning to the point where he controls goals and purposes. Since all
adults are different and at different stages in their own learning needs and goals, it is important to realize that it is not accepted that every adult has full autonomy nor self-teaching ability. Autonomy can be seen as having stages which adult learners can fit in or be matched to. This principle has great variance based on situations and the individual learner, yet is imperative to understanding an adult’s needs as a learner.

Compared to children, adults bring a larger wealth of experiences to learning situations. It is these experiences that should be capitalized on in order to best meet the needs of adult learners (Ross-Gordon, 2003). Furthermore, being able to learn through experiences is important and meaningful to adults. These ideas summarize Knowles’ third assumption, the role of learners’ experiences. This assumption requires knowledge of the learner and then applying that knowledge to what is taught and how it is taught in an effort to create a meaningful learning experience for an adult learner. This assumption emphasizes that those creating and delivering professional development must know their students and design a plan using this knowledge. Does this always or even regularly happen with professional development?

There are four means through which adults’ experiences can impact their learning. These means are; “create a wider range of individual differences, provide a rich resource for learning, create biases that can inhibit or shape new learning, and provide grounding for adults’ self-identity” (Knowles et al., 2015, p. 175). Of the four means, most early research focused on the first, second, and fourth in comparison to more current research, which focuses on the third and how adults’ experiences can serve as a gatekeeper to learning (Knowles et al., 2015). Recognizing this subtle facet of the larger area of prior experiences, acknowledging an experience can be either an asset or a barrier, is critical when looking at professional development.
Professional development often takes place on preselected dates that may be determined by a calendar committee a year in advance with predetermined topics based on current buzzword initiatives. This typical delivery schedule conflicts with the fourth andragogy assumption, readiness to learn. Adults, in order to be deemed ready to learn, need to experience a need to know or a need to do something more effectively (Ross-Gordon, 2003). The idea of being ready to learn is crucial in how an adult will receive and apply the goals and objectives of a given learning experience. When an adult is not ready to learn, the experience will not be as effective nor as meaningful as it is when an adult is ready to learn. Given the aforementioned anecdote regarding professional development occurring on preselected dates with a focus on predetermined topics, it becomes clear that considering when a participant is ready to learn should be a factor that is taken into account in every PD planning process to best help the learners meet goals and objectives.

Pratt proposed that one must consider both direction and support when learning involves adults (Pratt, 1988). Direction refers to if and how much a learner needs help and assistance from someone else during the learning process. This can be seen as directly related to how much the adult learner feels competent in the material and content of the learning that is to take place. The level of competence and dependence are inversely related: as the higher the competence the lower the dependence. Support can be equated to the affective encouragement that the learner requires from others during the learning process. Support is related to the learner’s commitment to learning and their confidence in their learning ability. This relationship follows that the higher the level of commitment and the more confidence a learner has, the less support he will require. Readiness to learn is a complex idea that requires an understanding of both direction and support to best meet the adult learner’s needs.
The fifth assumption has a direct connection to the fourth. Orientation to learning can be seen as an adult entering a learning situation after they experience a need in their life (Knowles et al., 2015). This idea not only connects to assumption four but also relates to another timing issue addressed in the first assumption with regard to when and how professional development is delivered. Even strong and appropriate professional development that is given at the right time for a learner, yet does not meet a need, may fail to yield the desired results. This assumption speaks to a need for differentiated learning that accounts for individual readiness and needs. The common one-size-fits-all approach does not meet this differentiated need, nor any assumption. With new standards being a recent and ongoing challenge for teachers, the need for professional development for the learner can occur at flexible times when such opportunities arise as opposed to traditionally predetermined dates. Teachers desire professional development with a focus on lesson plans, assessments, and interpretation of the standards that they use (Griffith, 2011). In the case of new standards, a need is clearly present for teachers, it will be when and how this need is addressed that will determine success of learning.

Adults prefer a problem-solving orientation to learning over a subject-centered learning approach (Knowles et al., 2015). One such way for adults to learn through a problem-solving orientation is to follow Kolb’s four step experiential learning cycle. This learning cycle contains the following four steps; concrete experience, observation and reflection, formation of abstract concepts and generalizations, and testing implications of new concepts in situations (Kolb, 1984). It is further said that the combination of these four modes create four learning styles (Knowles et al., 2015). Experiential learning is important in two ways; first, adults find appeal in experiences and second, experiences increased the likelihood of causing a positive performance change after professional development or training.
The final andragogy assumption centers on the idea that internal motivation is the most important motivation for adult learners. External factors, including but not limited to, career success, promotions, higher salaries, or success with students, can help to motivate adults, yet it is internal intrinsic motivation that is a more important factor for adult learners (Knowles et al., 2015). Intrinsic motivation will look different for every learner and manifest itself in a variety of ways which is why for example, some teachers go back to school to earn advanced degrees while others do not.

While adults may experience both intrinsic and extrinsic motivations to learn, intrinsic motivations are stronger, Wlodkowski offers an explanation as to what inspires adult learning. Adults gain motivation through the sum of the following four factors: success, volition, value, and enjoyment (Wlodkowski, 1985). Success in this context refers to the idea that adult learners want to be successful at what they are learning. It is important to note how closely the idea of volition ties to the first assumption of andragogy: the need to know why they need to learn something which feeds into the sixth assumption of motivation to learn. Volition also is tied to an adult learner having a sense of choice, the second assumption of andragogy. Value relates how an adult learner wants to learn something that has consequence to them, and how the learning will be applied in everyday life. For teachers this typically relates to two concepts: how it will improve their practice and how it makes the material more accessible to their students. Finally, adults want a learning experience to be pleasurable.

To further expound upon the work of Wlodkowski, it is important to note his accompanying traits describe what type of instructor can motivate an adult learner. Four traits and skills were identified as the following: expertise, empathy, enthusiasm, and clarity (Wlodkowski, 1985). The adult learner is more motived when an instructor or facilitator
possesses these characteristics. Expertise goes beyond knowing content, it is seen in this context as being able to effectively convey something beneficial to adults through an instructional process. Empathy allows an instructor to understand adult learners’ needs as well as being able to adapt instruction to meet these needs. Enthusiasm is seen through the value the instructor places on the matter being taught as well as doing so in an animated and passionate manner. Finally, clarity is exemplified through the ability to be understood by most learners as well as the ability to effectively redirect instruction to make accessible something that initially was not (Wlodkowski, 1985).

Knowing that some adult learners will be self-motivated to learn while others will not is an important consideration to keep in mind when thinking about and planning professional development opportunities and activities. Just as important as taking self-motivation into account is having a way to gauge the level of self-motivation so that data can be accurately used in the planning process. Much of the existing professional development is designed without taking teacher motivations into account, nor is it designed around their specific needs (Caddle et al., 2016). As the theory of andragogy has existed for many decades, it is troubling that these important tenants of adult learning are often ignored when educational experiences are designed for this specific category of learners. It is also troubling that the low performance of the nation’s schools and students is a long-standing problem that remains unsolved, yet the possible answer of better addressing adult learners’ needs seems to be a reasonable yet ignored solution.

Adult learners are unique. While the majority of undergraduate and graduate teacher education programs focus on pedagogy, which relies on giving all decision making to the teacher, those creating and designing PD must keep in mind that adults do not learn in the same way children learn. Teachers want to be asked what they need in order to successfully improve
student learning (Lucilio, 2009). Giving some ownership to the teacher, who in this case becomes the learner, is important in meeting their andragological needs. “Students made disciplinary content as personal as possible and, in the process found it impossible not to be transformed by it” (Chen, 2014, p. 415). While good instructional design practices call for needs assessments to help drive professional development instruction, these do not always take place. When they are administered the data produced is not always analyzed and applied appropriately. A good instructional practice such as a needs assessment is only as effective as the integrity with which it is applied and utilized.

A model was created using the theories from Knowles, Bloom, and Kolb, to address adult learning principles in a higher education classroom to better address the needs of adult learners who take these courses. Using theories from these three pioneers in education, a four-step model was created. This model focuses on the following steps: selection, reflection, application, and verification. The selection phase is based on adults needing control over their learning (Dunlap, Dudak, & Konty, 2012). The reflection phase, while not unique to adult learners, allows an aspect of critical thinking related to the learning experience. Reflective thinking was found to be a critical aspect of mentor delivered professional development (Yaffe & Maskit, 2010). The application phase is important as it allows adult learners to find meaningful ways to apply this new learning in a manner that is relevant and important to their lives (Dunlap et al., 2012). Finally, the verification phase allows adults the freedom and authority to determine if the strategies they applied in the application phase were effective for the chosen situation and possibly to other extended situations in a future time. While other models exist, it is important to appreciate and recognize that in some places, though not enough, adult learning is valued to the
extent that great thought and planning are put into practice to help meet the unique needs of these adult learners.

It is important to realize that many professional development experiences and activities are still being created and delivered without any attention paid to the needs, wants, or andragogical assumptions of adult learners. When the characteristics of adults who participate in professional development were identified, it was found that these factors aligned to adult learning principles (Weber-Mayrer, Piasta, & Yeager Pelatti, 2015). In this study a major focal point of adult learning was on the high importance that must be placed on taking into account what adults bring to learning experiences. Improved learning can and will take place when a program is designed around the adult learners’ experiences. This study may have been the first of its kind to look at large scale professional development with a lens on who was participating and what characteristics they have. While this is an important step forward, this notion further highlights the urgent need to study all aspects of adult learning with regard to how utilizing the included principals could benefit the effectiveness of our professional development efforts.

**Related Literature**

**Professional Development Introduction**

Professional development has many accepted definitions. Amongst the many respected and acceptable definitions, the following offer a solid foundation as a basis to begin focusing on why professional development is central to this study. Professional development is the “sum total of formal and informal learning experiences throughout one’s career from preservice teacher education to retirement” (Fullan, 1991, p. 326). Professional development in an early childhood setting can be defined as “facilitated teaching and learning experiences designed to enhance practitioners’ knowledge, skills, and dispositions as well as their capacity to provide
high-quality early learning experiences for young children” (Snyder et al., 2012, p. 188).

Finally, Laura Desimone used a definition centered on the experiences gained from activities and interactions that increase knowledge, skills, and improve practice while contributing to personal, social, and emotional growth (Desimone, 2011).

While everyone involved in education should be able to articulate their own definition of what professional development is, it is not universally agreed upon what constitutes professional development or more importantly, what constitutes appropriate or effective PD. The first definition allows for both formal and informal learning experiences, while the subsequent definition focuses solely on facilitated experiences. Close reading of the three aforementioned definitions leads to multiple parallels, discrepancies, or omissions. Careful studying of the dozens of other published definitions of professional development will offer similar parallels, discrepancies, and omissions. In fact, it is, the wide scope of the understood meanings and definitions of professional development that allows for and provides opportunities for rich discussion and learning to take place regarding this topic. But it is also these differences that make the concept of professional development one that is challenging to quantify, compare, and most importantly, evaluate.

The Importance of Professional Development

The importance and purpose of professional development for teachers, schools, and systems cannot and should not be understated. It was concluded that sustained professional development that is job-embedded may lead to improved student achievement in mathematics (Althauser, 2015). Research stresses that constant development and growth are an important part of teaching and being a teacher (Holm & Kajander, 2015). “Teacher preparedness is linked to student achievement, yet regularly teachers are entering the profession unprepared” (Bayar,
Professional development is a vehicle used by schools and systems to help fix this problem. Professional development is the means with which districts and systems can use to strengthen teacher performance levels as well as raise student performance levels (Mizell, 2010). It follows that the quality of a community’s education system and programs have a direct relationship to the success of that community’s economy. Professional development can directly affect teacher improvement, student learning and improvement, and in turn can help the economic health of a community. Informed and inspired teachers affect student achievement and professional development is the vehicle to realize this (The Importance of Staff Development: Three Imperative Workshops for Teachers, 2010).

The importance of a successful and well-designed professional development program needs to be understood by all stakeholders. Yet many stakeholders are not aware of their local school or school system’s methods for improving teacher and student learning (Mizell, 2010). Successful programs are often celebrated and shared. This is accomplished through partnerships, mentor programs, community involvement, volunteer programs, as well as open and inviting environments. A lack of knowledge of what schools and systems are doing to improve teacher and student learning implies a lack of success in this area. This also exemplifies a lack of stakeholder involvement in the overall operations of the school and system. Published high-stakes test scores are not enough to gain a full picture of growth and success in teacher and student learning. If and when professional development is better designed and better results are obtained, more community stakeholders will become aware of the good things that are happening in their school systems. Considering the amount of time and money devoted to professional development, a level of transparency should be both the expectation and the norm.
What and how teachers learn is a central and major component to school reform policies at the local, district, state, and national levels (Minor, Desimone, Lee, & Hochberg, 2016). Beyond the teachers, administrators, and instructional support, the local school board has a responsibility to be involved and interested in professional development (Korelich & Maxwell, 2015). Since professional development is tied to local and national policies, as well as many stakeholder groups and participants, it is important to understand what desired outcomes professional development should yield. Professional development should enhance teacher knowledge, cause a change in beliefs and practice, as well as lead to enhanced student achievement (Capps et al., 2012). These three simple yet powerful actions are the basis of true reform and a reasonable target for outcomes when designing and implementing professional development experiences. Yet even these outcomes are not universally recognized nor are they agreed upon.

While the goal of specific professional development sessions and activities may vary from school to school, a focus on teaching skills and providing quality education which can be measured by student achievement are paramount. Two behaviors were highlighted in the following study by Byorklund-Young, as having strong correlations to student achievement. These behaviors, which could be, or could become a focus of a professional development initiative, are strong classroom behavioral management, and decreased teacher sensitivity (Bjorklund-Young, 2017). The study found that a one standard deviation increase in student behavior management yielded a 21% increase in student learning, while a one standard deviation increase in teacher sensitivity yielded a 42% decrease in student learning. Interestingly it was found in the same study that when it came to challenging students, low quality teachers saw high gains in student learning while medium to high quality teachers saw no increase. There are
many research based areas that can be addressed to help improve student learning, yet even the
two aforementioned would need to be framed and designed using Knowles’ andragogy
assumptions to be as effective as desired.

With the foundation of professional development being focused around strengthening
teacher knowledge, teachers will have more tools and an increased ability to better perform their
jobs in the classroom. The second outcome is possibly the most important. If true reform and
change are needed and desired, then a change in both belief and practice is necessary. If a
professional development experience does not lead to changes in beliefs and practice then a
change in outcomes will not occur. Finally, the purpose for professional development should
return the focus back to students. If teacher knowledge is improved and a change in practice and
beliefs have occurred, then enhanced student performance and achievement is a logical outcome
that follows. The aforementioned example fits these three desired outcomes. The two behaviors,
student behavior and decreased sensitivity, are the knowledge that lead to the reform or change
of teacher practice. The evidence provided from the study shows the student outcome that is the
result.

**Traditional and Non-traditional Professional Development**

Literature has classified professional development activities into two categories:
traditional and non-traditional (Bayar, 2014). Traditional professional development typically
takes place in the form of a short workshop or conference. Non-traditional professional
development can include but is not limited to: mentoring, coaching, and peer observation. The
inherent difference between these activities include but is not limited to the amount of time
provided for activities. Traditional professional development happens in discrete sessions.
Activities such as workshops and conferences are not continuous and can lack necessary follow-through.

Research is critical of traditional professional development experiences and activities. Having learning sessions or activities that can fit into crowded schedules while also being efficient with respect to time and expense may seem like suitable options, these types of activities tend to be ineffective with regard to desired outcomes (Birman, Desimone, Porter, & Garet, 2000). Without proper time allocated to professional development, there will not be ample opportunity to have the influence necessary to change teaching practices. It was found that, for some teachers, extensive professional development can yield a notable change in their beliefs about optimum teaching practice (Arce, Bodner, & Hutchinson, 2014). The key element again is the idea of extensive activities and follow-through and the role that time plays in professional development and the failure that short, discrete, traditional sessions can have on desired outcomes.

Traditional and non-traditional professional development is also defined and recognized as a style. This distinction is often understood to parallel the differences of teaching for traditional and facilitating for non-traditional. The non-traditional approach allows for reflection and is often considered to involve inquiry. These differences can further be seen as comparing traditional to constructivist (Arce et al., 2014). While a change in this style or approach to be more constructivist or include more inquiry has been seen as effective, it was also noted that teachers need to take an inquiry approach to their own learning and work. Traditional professional development approaches tend to act on teachers as opposed to work with teachers causing more dependency instead of creating a productive and challenging environment (Hardy & Ronnerman, 2011). It was found that in higher education, there is a steady rise in participation
from nontraditional adult learners (Chen, 2014). These nontraditional higher education students are and will become teachers who participate in professional development. Professional development models that meet their unique adult learning styles will be necessary for them to have successful experiences.

Expectations and Effectiveness of Professional Development

Effective professional development is capable of increasing teachers’ expectations as well as increasing their professional community citizenship, which can increase the number of active believers (Ferguson & Hirsch, 2015). This finding highlights the inherent value of professional development beyond a knowledge based experience and expands the idea into a method capable of affecting the overall culture of a school or system. This also highlights the need for effective professional development, and conversely, if professional development is not deemed effective, then a poor professional community citizenship may invade the culture and fail to yield active believers. If and when professional development and instructional support activities are deemed to have represented high standards, as determined by the participating teacher learners, the teachers are more likely to see these activities as effective in enhancing and improving instructional skills.

Providing a high level of expectations for teachers will allow them to see the value and importance in what they are doing and will in turn have them receive the instruction better. The added benefit of this is when teachers have high expectations placed on them with regard to their professional development and see them as such, the teachers then in turn raise expectations they place on students (Ferguson & Hirsch, 2015). The evidence further proves that the culture obtained through active believer educators can help to influence both other teachers and generate higher value-added gains and increased student engagement. The positive outcomes of this
effective professional development can be seen as a direct result of following the assumptions of andragogy.

If effective professional development is crucial yet not obtained everywhere, it stands to reason that what constitutes effective professional development may not be a universally understood concept. A simple view of effective professional development calls for an ongoing process that spans an educator’s career while having a significant impact on student performance (Cano, 2006). While there are various accepted sets of components that are understood as necessary for effective professional development, this review will continue by examining six components that are identified by Glover et al., 2016. In order for professional development to be deemed effective, it should: deepen content knowledge, be designed for active teacher engagement, be sustained over time, include a substantial amount of contact hours, link to teacher experiences, and finally embrace and encourage teachers to communicate collegially before, during, and after to support the desired changes (Glover et al., 2016).

It is apparent that there are parallels between many of the six andragogy principles and these six effective professional development tenants. Yet it is also apparent that accepted definitions of professional development previously mentioned do not fully align to what it takes to be deemed as effective for professional development when following Glover, Nugent, Chumney, Ihlo, Shapiro, Guard, Koziol, and Bovaird’s tenants. This inconsistency may account for much of the variance in the success of professional development that is seen in schools and school systems. It is also important to reiterate that this study identified a lack of experimental investigations designed to analyze aspects of professional development and their possible correlations to student outcomes.
In order for professional development to be effective there is a need to have clear goals. A study from the University of Groningen in The Netherlands, that looked to find the effectiveness of a professional development program designed to improve reading achievement, focused on teachers needing to be versed and taught about the use of goals, data driven decisions, and instructional practices in their learning (Van Kuijk, Deunk, Bosker, & Ritzema, 2015). A program of professional development such as this one, was focused on helping teachers with a defined goal of improving reading comprehension and contained tools and practices to help better focus on goals, data, and instruction. This type of program and study allows for analysis to take place with regard to many key features found in our education systems. Findings showed that students in the experimental condition performed significantly better than those in the control group. The approaches taken and positive results obtained offer a foundation to replicate and expand through practice and research.

Professional development is often expected to be a means through which teachers can sustain or even improve teaching skills. A study conducted by Scheeler, looked at factors that were deemed to be important for sustaining teaching skills over time. It found that teachers need immediate feedback to help promote skills acquired though learning opportunities. Teachers need training to be geared toward mastery of what they are learning in order to help maintain that desired outcome and behavior. Teachers need to have training be designed and planned so that programming is for generalized learning. Finally, teachers need true performance feedback in a classroom setting (Scheeler, 2008). Many accepted instructional design models are cyclical in nature and have the final step of the cycle focused on feedback, evaluation, or revision. While Scheeler’s study included this step, many other definitions and previously mentioned
components fail to recognize this important reflective and adjustment component that can allow for personal growth and program improvements.

Continuing with the study of effectiveness with regard to professional development, the effective use of time, focused learning, and organization can make professional development become more purposeful (Guskey & Yoon, 2009). Gusky and Yoon, also mention an important aspect of professional development that was neglected in other articles and studies, that the foundation of professional development should be created starting with research based ideas and practices. Staff development, if it is meant to be helpful and effective should be based on the type of research and practices that are described in NSDC’s Standards for Staff Development (Hirsh, 2001). Professional developers and those making decisions should move away from designing professional development based on intuition, tradition, and folklore and begin to move toward inquiry based learning (Guskey & Yoon, 2009). Yet, it was found that no study has yet to connect the participation in inquiry based professional development and the desired outcomes of teacher PD: enhancing teacher knowledge, changing beliefs and practice, as well as enhanced student achievement (Capps et al., 2012).

While a study may not exist connecting inquiry based professional development and those specific desired outcomes, a conclusion was drawn that is helpful toward connecting inquiry as one aspect of experiences and some desired outcomes. It was concluded that professional development with a broad conception of education that involved rich, collaborative inquiry for teachers that extends into their work resulted in substantive student learning and improved outcomes on multiple standardized measures for student assessment (Hardy & Ronnerman, 2011). While this does not fill the gap that Capps identified, it does strengthen an argument for inquiry experiences in professional development. It is clear that differing
definitions make comparing literature and outcomes of studies a challenging task that needs to be revisited to help with improvement and consistency.

Another study from University of Waikato, New Zealand, determined and described four principles of effective professional development. The four principles are: teachers should be treated as active learners who are able to and given the opportunity to construct their own understanding; teachers should be treated as professionals and thus be empowered; the education of teachers must be focused around classroom practice; and finally, teachers should be treated as they would expect teachers to treat students (Chalmers & Keown, 2006). Bates and Watt identified the following seven strategies essential in order for continuous professional development to be successful. Continuous professional development needs to involve all staff members, support the school development plan, reflect wide national agendas, involve coaching and mentoring, form vertical and horizontal partnerships, and continually offer reflection opportunities (Bates & Watt, 2015). This again is where varied definitions of professional development, varied indicators of effectiveness, and variances in desired outcomes make for a difficult comparison of studies, components, models, definitions, and findings. While there are commonalities in each of these concepts, ideas, and definitions, having different types and numbers of indicators and principles makes for the idea of consistency to be an impossibility. Each set of definitions offer value which is why including different examples from literature is important regardless of the problems these different definitions present.

With regard to evaluating and effectiveness, some specifics have been identified through studies. Professional development can be unsuccessful, not because of an unwillingness of participants, but because ideas are not implemented (Ferguson, 2006). The same study found that professional development must have value that is clearly evident to the learner and be
applicable. This second point is in line with andragogy and its six foundational assumptions. It is important to recognize when and how effective professional development practices align with andragogy. It is also important to recognize when poor planning or lack of follow through, as evidenced through the aforementioned citation regarding the lack of ideas being implemented, can be just as detrimental as a lack of attention to andragogy.

While technology is an answer for many needs and problems in society, as well as in education, it was determined that technology, when considered as a tool, is not enough to make professional development effective (Chalmers & Keown, 2006). Communities of practice, however, are a way for technology to be used in a meaningful manner to help create effectiveness through technology based professional development. For communities of practice to be successful and effective they need to have topics of vital interest, be facilitated by a respected community member, and create time for, as well as encourage adequate participation. Furthermore, communities of practice need to be built on the core values of the participating community, involve key thought leaders, build strong personal relationships, have an active and passionate core group of members, share information through thinking together, be easy to access and use, and finally they need to create real and authentic dialogue. This research suggests that careful planning and implementation is the key to a successful community of practice. Additionally, parallels to previously mentioned works and research can be seen in these identified best practices.

Gosselin conducted research in an attempt to identify professional learning needs in order to allow for the creation of an individualized professional development experience via an online learning environment (Gosselin, 2016). Online teaching and learning has been a source of excitement and anxiety for students and educators alike. This study revealed that participants
held threshold concepts, skills, and attitudes about online teaching. It concluded that values and emotions with threshold concepts need to be addressed in all professional development. While online education may be the direction of the future with regard to professional development, support, relationships, and better understanding comfort zones will be important to any desired success.

While technology use and incorporation is often a viable option, Buxton and De Muth found that distance participants in professional development felt less connected than participants who had engaged in similar activities that were presented in a face to face setting (Buxton & De Muth, 2012). It should be noted that the same study found that the participants in this professional development program, where some participated at a distance, while others were face-to-face, were both similarly satisfied with presentation, audio and visual quality, and felt they could similarly apply what they learned at work. So, while the relevance was apparent in both forums, the lack of connection at a distance was also notable. Technology and distance learning may provide convenience and cost-effective solutions and opportunities to teachers, it remains notable that the design and features are still important and should intentionally meet the needs of adult learners.

**High Quality Professional Development**

One distinction amongst professional development that is prevalent in the literature is the concept of high quality PD. One view of high quality professional development is that it has the ability to impact knowledge and instructional practices which can then positively impact learning outcomes of students (Snyder et al., 2012). According to a policy brief provided by the National Comprehensive Center for Teacher Quality, to be considered high quality professional development, PD must directly impact teacher practice (Archibald, Coggshall, Croft, & Goe,
2011). This will in turn, if done correctly, allow students of teachers who received high quality professional development and applied it to their instructional practices to learn content at a higher level.

Archibald, Coggshall, Croft, and Goe identified five characteristics as being necessary components of high quality professional development. First, high quality professional development must align to school and state goals and standards to also include formative teacher evaluation. Second, high quality professional development must also focus on core content as well as teaching strategies for the given core content area. Third, high quality professional development must allow opportunities for teachers to learn new teaching strategies. Fourth, high quality professional development must also allow for collaboration opportunities amongst participating teacher learners. Fifth and final, high quality professional development must have follow-up and feedback (Archibald et al., 2011). These five characteristics are a strong mix of both accepted instructional design models’ components and features with the incorporation of elements of some of Knowles’ adult learning principles.

An important aspect related to high quality professional development is the inclusion of professional learning communities (Stewart, 2014). Professional learning communities allow a level of collaboration that moves away from passive and intermittent professional development. Professional learning communities allow for an environment and experience that is active, consistent, based in the teaching environment, and one that is peer supported. This research includes six partnership principles to include: equality, choice, voice, reflection, praxis, and reciprocity. These principles align well with adult learning principles. Equality calls for teachers to have input into the planning of professional learning activities. Choice allows teachers to choose what and how they learn. Voice allows an empowerment to further support
the first two principles to be realized. Reflection is a common theme in many best practices adult and otherwise which gives ownership to the learner through self-evaluation. Praxis allows for real-life applications in practice. Finally, reciprocity allows and expects all to be engaged in the offering and receipt of feedback. To further support the value and importance of learning communities, they are seen as both a great practice as well as a cost-effective measure of disseminating information amongst groups of educators (Cano, 2006).

The idea of transforming professional development to professional learning still can allow for goals of professional development to be met. Professional learning should be engaging, meaningful, and involve challenging and exciting activities to help bring meaning to any learner (Wiener, 2013). This type of focus will help create an environment that will support learning. Professional learning communities can be focused on a professional development cycle for continuous improvement. This five-part cycle is rooted in student learning and ways to focus on achievement. The five stages of this cycle are: identify student learning needs, identify related teacher learning needs, learn or review concepts, apply concepts to lessons, and critique and reflect on the lessons (Stewart, 2014). Ultimately, professional learning through professional learning communities is focused on a workplace learning environment that actively uses student data to learn through experience as well as continual reflection. This type of professional development meets the needs represented by tenants of high quality PD, while taking a non-traditional, adult learning approach which can help serve as a blueprint for other learning experiences.

With regard to high quality content professional development, a study by Minor, Desimone, Less, and Hochberg was conducted to see what teachers learn and do as a result of the high-quality PD they received. It was concluded that what teachers learn and do based on high
quality content PD is dependent on their prior knowledge (Minor et al., 2016). The same study further concluded that when professional development was high quality content driven and pedagogy focused, prior knowledge once again was the determining factor on the outcomes. While this agrees with a tenant of andragogy, specifically the role of learners’ experiences, it makes the need for differentiated and individualized high quality professional development an overwhelming challenge. With each adult learner being unique and coming into professional development activities with varied educational experiences as well as a unique knowledge set, finding an appropriate way to gauge each learner’s experiences and knowledge to either get all at an equal place before professional development or tailoring an individual program for each is a massive, difficult, time intensive, and costly task for schools and systems. Yet meeting their needs and making content relevant to the adult learner is in line with the foundations of andragogy.

Since there are varied definitions of professional development, what it takes to be effective, what it means to be considered high quality, and what outcomes should be targeted, it should be no surprise that how to evaluate professional development is also not universally agreed upon. Research from Desimone recommends that when studying the effects of professional development, it is important to move away from observations, interviews, and surveys (Desimone, 2009). This study reveals that as professional development is centrally important to educational reform, that best practices should be used when measuring its effects. Desimone in a later study, reiterates the importance of using appropriate tools and also adds that the most important question to ask is: does this professional development lead to student learning improvements (Desimone, 2011)? Supporting these findings, Archibald, Coggshall, Croft, and Hall found that outcomes of professional development should be looked at using three lenses.
Evaluations should be conducted on the process, on the impact, and finally there should be a cost, benefit, and impact analysis completed to see how effective the professional development truly was (Archibald et al., 2011).

It was surprising to this researcher how infrequently cost and fiscal responsibility were mentioned in the majority of studies and literature on professional development considering the high amount of money that PD accounts for within a school and system’s budget. It was estimated in 2014 that each teacher had $18,000 dedicated to their improvement annually by their home school system (McGovern et al., 2015). This total amount for each teacher accounts for between 6% and 9% of a school system’s annual budget. “For years, educators have been confronted with poorly designed staff development. Scarce resources have been wasted because few understood or took time to understand what helps adults acquire the knowledge and skills that help students achieve” (Hirsh, 2001, p. 255). The real problem is not recognizing the deficit of effective, quality professional development nor not analyzing the cost being spent on ineffective programs. The failure to correct the issue is the real problem.

Training of teachers is an important tool for quality management (Shabbir et al., 2015). It is important to review practices used for development and systems in place. The idea of quality management and the necessity of the review of programs and effectiveness should not be overlooked in the big picture of education. A review of programs involving Pakistani University teachers found that follow up systems after training were not working but also verified the importance of private sector universities. Considering the high cost of professional development programs as well as teacher education and improvement initiatives, the idea of maximizing the benefit of that investment and evaluating the effectiveness should be a high priority for all involved. Having universal definitions of success and effectiveness would also make evaluations
of the cost and value of such professional development a more exact, quantifiable, and reliable process.

**Working Conditions**

While this review of literature focused heavily on professional development, as this area is crucial to the focus and study of this dissertation, working conditions is also a critical area to explore. Working conditions, specifically teacher perception of professional development, are this study’s tool through which data will be collected and compared to school achievement. The 2016 North Carolina Teacher Working Conditions Survey will be used to gather this data. The North Carolina Teacher Working Conditions Survey, which is also known as the TELL survey, is used in multiple states and contains nine categories of working conditions, one of which is professional development (North Carolina Teacher Working Conditions: About the North Carolina Teacher Working Conditions Survey, 2016). Working conditions were found to predict mathematics achievement and, to a lesser extent, can also predict reading achievement (Ladd, 2009). Interestingly, the same study found that higher ratings of professional development yielded negative achievement correlations. The authors attributed this to more resources being allocated to poor performing schools thus possibly skewing data. In this study, working conditions were also found to predict which teachers would remain at or leave their current school. The top dimension correlated to the level of attrition prediction was related to leadership.

A separate study conducted through the University of Texas at San Antonio found that teacher attrition was the greatest during the high stakes testing era at low-performing schools (Sass, Flores, Claeys, & Perez, 2012). Yet it was found that at charter schools, factors such as age, gender, and school level tended to moderate attrition rates. While attrition can be connected
to working conditions, there are other factors that can work to affect this data. An additional study by Kane, Kerr, Pianta, Ferguson, and Hirsch using TELL data from 2012 found that four areas of the survey; student conduct management, demands on time, professional autonomy, and professional development, were significant predictors of student value-added gains (Kane et al., 2014).

A different study through the Project on the Next Generation of Teachers at the Harvard Graduate School of Education concluded that better working environments yielded greater student achievement growth (Johnson et al., 2012). Additionally, it continued with the idea that supportive working environments contribute to student achievement. The same study also added that working conditions affect the career choices of those experiencing said working conditions. This concept of the importance of working conditions, environments, and the effect they can have on learning is not new. A 1904 statement from teacher union organizer Maggie Haley is summarized as: the atmosphere where it is best to teach is the same atmosphere where it is best to learn and burdens that affect teachers similarly affect students. That statement, which is quantified by the aforementioned study underscores the importance of working conditions and the school environment.

Further studies on working conditions beginning with work from Kraft and Papay, have parallel results. It was found that supportive professional environments improve teachers’ effectiveness over time more than the effectiveness of teachers in less supportive environments (Kraft & Papay, in press). The same study added that teachers in more supportive environments remain at the same schools. It further concluded that improvements from supportive environments can accumulate over ten years for teachers in those environments. It is clear that working conditions affect the atmosphere and culture of a school and can have great effects to
not only transcend teachers and their attitudes but also the learning environment of the students they work with.

Another study by Wagner and French regarding working conditions found that a teachers’ intrinsic motivation toward professional development was associated with their perceptions of the workplace and of professional development context (Wagner & French, 2010). This idea is very important as it ties perceptions of professional development to workplace conditions. With previous links between working conditions and professional growth, as well as student and school achievement, this is an important and noteworthy connection. This connection is also vital as the intrinsic motivational element is directly connected to andragogy’s sixth assumption. The same study further found that after professional development, seeing students change in large, positive degrees as a result of that PD being applied turned into an important motivating factor for teachers. It is both powerful and important to see the effects of what was studied with both intrinsic and extrinsic lenses for teachers. The impact of working conditions is important and relevant to the overall success and culture of a school with regard to both teaching and learning.

Summary

Adult learners have needs that are unique when compared to those of children. Malcolm Knowles highlights these needs with his andragogy theory. What makes andragogy different from pedagogy can be summarized as pedagogy is teacher controlled while andragogy needs to be focused on the adult learner, their needs, and motivations. Teachers are learners who practice pedagogy in their profession but learn best under andragogy and its assumptions. Many of the people who choose, create, deliver, and evaluate professional development programs, sessions,
and activities received their education, training, and have a background in pedagogy, not andragogy.

Since professional development is the main avenue schools and school systems have for improving teacher knowledge and skills and by extension student achievement, the connection between adult learning theory and how professional development is designed and delivered is a strong and important one. It stands to reason that the effectiveness of professional development and the satisfaction of its participants are related to the intentional use of adult learning principles. Furthermore, with the connection between working conditions and achievement, how teachers perceive the professional development they receive is also extremely important and worth studying.

Professional development has implications that begin with teacher improvement, extend to student achievement, and is linked to a community’s economic health. Regardless of the varied definitions and understandings of professional development, following the aforementioned implications is a way to keep the focus of professional development on what is important for schools and the local community. With professional development being the one method school districts have to improve practices in teachers, its design is an often overlooked, crucial feature that needs additional study and attention. Effective professional development should change the practice of teachers and the culture of how learning is approached in schools. It is evident that the assumptions of adult learners and the tenants of effective professional development are not always focal points in the design or the delivery of PD.

The inclusion of professional development in the North Carolina Teacher Working Conditions Survey verifies the categorization of PD as a working condition. The perceptions that teachers have about their working conditions yield important information about teacher
retention and student achievement. If professional development is not designed to follow the assumptions of adult learners, the working conditions could show this through a lack of teacher satisfaction. It also stands to reason that if adult learning assumptions are not followed, the effectiveness of the professional development may be compromised.

Overall working conditions are strongly linked to student performance. Evaluating and studying the working condition related to professional development is an important and necessary next step. Work from Lucilio, (2009), Capps, Crawford, and Constas (2012), and Glover, Nugent, Chumney, Ihlo, Shapiro, Guard, Koziol, and Bovaird (2016) all indicate a need for studies relating professional development and student outcomes or achievement. With clear connections between professional development and student outcomes as well as working conditions and student outcomes, the design and perception as well as how they relate to adult learners and its correlation to school achievement is an area that warrants study and statistical analysis. This study will attempt to prove that any such correlations exist. This dissertation continues with chapter 3. Chapter 3 will fully explain the research design, participants, instrumentation, and data analysis to be used.
CHAPTER THREE: METHODS

Overview

Chapter Three will begin with a description of the research design. The research design description is followed by the research question and accompanying three hypotheses. This chapter continues with the participants of the study and the setting they represent. Next the instrumentation that is used for data collection is described in detail. The procedures follow with a thorough description so they may be replicated by another researcher. This chapter concludes with a description of the type of data analysis used.

Design

This quantitative, non-experimental study used an ex post facto correlation design. Correlational research designs are useful for studying educational and social science problems (Gall, Gall, & Borg, 2007). Utilizing a correlational study allowed for an analysis of Pearson’s product-moment, also known as Pearson’s $r$ to attain information about both the direction and strength of the linear association between scores on $X$ and $Y$ (Warner, 2013). The predictor variable was educator perception of professional development as defined by the aggregate total of the 13 items pertaining to professional development on the 2016 North Carolina Teacher Working Conditions Survey (North Carolina Teacher Working Conditions: About the North Carolina Teacher Working Conditions Survey, 2016). The criterion variable was the 2015-2016 North Carolina School Performance Grade score. This score was calculated by assigning 80% of the score using the school’s total achievement score and 20% based on the student’s academic growth (2016 READY Accountability Background Brief, 2016). Both variables were archival, hence the use of an ex post facto designation. The comparison of the predictor variable was completed with three groups of the criterion variable, one each for elementary schools, middle
schools, and high schools. Due to the continuous nature of both scores, a Pearson’s $r$ was an appropriate choice to measure the direction and magnitude of the relationship they represent (Gall et al., 2007).

**Research Question**

The research question for this study is:

**RQ1:** Is there a relationship between the educator perceptions of professional development and school achievement in North Carolina public schools?

**Hypotheses**

The null hypotheses for this study are:

**$H_01$:** There is no significant relationship between educator perceptions of professional development and school achievement in North Carolina public elementary schools as shown by the North Carolina Teacher Working Conditions Survey Professional Development construct and School Performance Grade score.

**$H_02$:** There is no significant relationship between educator perceptions of professional development and school achievement in North Carolina public middle schools as shown by the North Carolina Teacher Working Conditions Survey Professional Development construct and School Performance Grade score.

**$H_03$:** There is no significant relationship between educator perceptions of professional development and school achievement in North Carolina public high schools as shown by the North Carolina Teacher Working Conditions Survey Professional Development construct and School Performance Grade score.
Participants and Setting

The participants for this study were drawn from North Carolina public schools. One high school from each of the 116 North Carolina county and city school districts who have available data was randomly selected. This procedure was repeated so that one middle school and one elementary school were randomly selected from each of the same, identified 116 reporting North Carolina county and city school districts. Due to both a lack of data or non-traditional school environments, North Carolina DHHS, NC Deaf and Blind Schools, Adult Corrections, Juvenile Justice, Virtual Public School, and Cherokee Center Schools were not included in this data set. Each group of 116 randomly selected schools were used for one of the three null hypotheses. Having samples sizes of 116, exceeds the 66 that are necessary for a medium effect size using statistical power of $N=.7$ with an alpha value of .05 when analyzing correlation coefficient ($r$) (Gall et al., 2007, p. 145). Warner recommends a sample size of 121 given the same statistical power ($N=.7$) and alpha value of .05 (Warner, 2013). The choice of 116 should yield a medium effect size as it satisfies Gall, Gall, and Borg’s parameters and comes close to satisfying Warner’s.

There were a total of 2433 public schools in North Carolina in school year 2015-2016 (Facts and Figures 2015-16, 2016). Represented in these schools are 119,177 educators, of which 101,864 participated in the North Carolina Teacher Working Conditions Survey (North Carolina Teacher Working Conditions Results, 2016). The professional development construct score was used for each randomly selected school from the 2016 North Carolina Teacher Working Conditions Survey as the predictor variable. The North Carolina School Performance Grade score was used for each school as the criterion variable.
**Instrumentation**

The 2016 North Carolina Teacher Working Conditions (NCTWC) Survey was used in this study. Though this instrument contains nine constructs with multiple items in each, only the professional development construct and its accompanying 13 items was used for this study in order to keep a focus on professional development perceptions and adult learning. The items in this construct include the following.

- Professional development enhances teachers’ ability to implement instructional strategies that meet diverse student learning needs.
- Professional development provides ongoing opportunities for teachers to work with colleagues to refine teaching practices.
- Professional development enhances teachers’ abilities to improve student learning.
- In this school, follow up is provided from professional development.
- Professional development is evaluated and results are communicated to teachers.
- Professional learning opportunities are aligned with the school’s improvement plan.
- Professional development deepens teachers’ content knowledge.
- Professional development is differentiated to meet the individual needs of teachers.
- Professional development offerings are data driven.
- An appropriate amount of time is provided for professional development.
- Sufficient resources are available for professional development in my school.
- Teachers have sufficient training to fully utilize instructional technology.
- Teachers are encouraged to reflect on their own practice.

The professional development construct of the NCTWC survey has a Cronbach’s Alpha of .956, which is the highest of all nine constructs for this instrument (North Carolina Teacher
Each item included in the professional development construct of the NCTWC has a Likert scale
that allows for responses of; strongly disagree, disagree, agree, strongly agree, and don’t know.
Data summaries are provided by item to show the percent of educators that agree with each
question, which is defined as the sum of the percent of educators who chose either agree or
strongly agree.

The second instrument and measure that was used in this study was the North Carolina
School Performance Grade score. This score is calculated for K-8 schools by using the
following indicators; End-of-Grade Reading (grades 3-8), End-of-Grade Math (grades 3-8), End-
of-Grade Science (grades 5 and 8), End-of-Course Math I, and End-of-Course Biology (2016
READY Accountability Background Brief, 2016). For high schools this score is calculated by
using the following indicators; End-of-Course Math I, End-of-Course English II, End-of-Course
Biology, the ACT (percent of students who score 17 or above), ACT WorkKeys (percent of
students who receive a silver certificate or better), math course rigor (percent of students who
successfully complete Math III), and 4-year graduation rate (percent of students who graduate in
4 years). An achievement score for each indicator is then calculated by averaging the identified
assessment results. The percentage of students who meet the standard is then divided by the
number of students for that indicator. A total achievement score is then calculated by adding all
corresponding totals of who met the standard for all indicators and dividing by the total number
of scores.

While the total achievement score is a valuable measure for school performance, North
Carolina also uses an Education Value Added Assessment System (EVAAS) to make a School
Performance Grade that factors growth into each school’s score (2016 READY Accountability
Background Brief, 2016). This system is designed to measure growth on end-of-grade and end-of-course assessments for groups of students over a one-year period. The growth score is then factored in with the total achievement score to determine each School’s Performance Grade score. The total achievement score is multiplied by .8 and the growth score through EVAAS is multiplied by .2. The sum of these two products creates the School’s Performance Grade score. This measure combines standardized results with a growth factor to give a more complete picture of school performance while assigning a large amount, 80% of the weight, to standardized assessments.

**Procedures**

This study began by the researcher seeking and receiving research approval from the dissertation committee. Once this was secured, all necessary steps and paperwork were completed in an effort to receive Instructional Review Board (IRB) approval. Once IRB approval was secured, a list of all schools in each county was used along with a random number generator in order to randomly choose one public elementary, middle, and high school from each reporting county and city school system in North Carolina. The researcher then accessed the publicly available information from the North Carolina Teacher Working Conditions Survey. The 13 percentages, representing each item by the percent of educators who selected ‘agree’ or ‘strongly agree’, were averaged to create a composite professional development construct score for each of the 348 randomly selected schools.

The researcher then accessed the publicly available North Carolina Department of Public Instruction website and found the School Performance Grade score for each of the randomly chosen 348 schools. The 348 composite professional development scores and School Performance Grade scores were then paired as a set of predictor and criterion variable values.
Next the scores were disaggregated by elementary, middle, and high school, yielding 116 predictor-criteria variable pairs for each of the three categories. This allowed for data analysis to occur for each of the three null hypotheses.

**Data Analysis**

Linear correlations utilizing Pearson’s $r$ were used to test the three null hypotheses for direction and strength of the predictor variable and criterion variable; educator perceptions of staff development and school achievement. This analysis was chosen because correlation research design is appropriate for non-experimental studies seeking to find and analyze relationships between two variables (Gall et al., 2007). Each null hypothesis was tested using an alpha level of .05. Data was screened through the use of scatterplots in order to detect the existence of any inconsistencies and outliers. Assumption tests for outliers, linearity, and normality was conducted. A scatterplot was used for visual inspection to determine if any bivariate outliers were present. The assumption of linearity was tested using a scatterplot. Histograms were used to test each variable for univariate normal distribution. A scatterplot was used to check the assumption of bivariate normal distribution. The scatterplot was examined to ensure that $Y$ scores were normally distributed for $X$ and $X$ scores are normally distributed for $Y$ (Warner, 2013, p. 165).
CHAPTER FOUR: FINDINGS

Overview

The purpose of this study was to investigate the relationship between teacher perception of professional development they received as measured by the North Carolina Teacher Working Conditions Survey professional development construct score and school achievement in North Carolina public schools as measured by the school performance grade. This study also disaggregated the investigated relationship to look specifically at elementary, middle, and high schools. At each of these three school levels this study sought to determine the strength and direction of any such relationship between perception of professional development and school achievement.

Research Question

RQ1: Is there a relationship between the educator perceptions of professional development and school achievement in North Carolina public schools?

Null Hypotheses

H₀₁: There is no significant relationship between educator perceptions of professional development and school achievement in North Carolina public elementary schools as shown by the North Carolina Teacher Working Conditions Survey Professional Development construct and School Performance Grade score.

H₀₂: There is no significant relationship between educator perceptions of professional development and school achievement in North Carolina public middle schools as shown by the North Carolina Teacher Working Conditions Survey Professional Development construct and School Performance Grade score.
**H₀₃:** There is no significant relationship between educator perceptions of professional development and school achievement in North Carolina public high schools as shown by the North Carolina Teacher Working Conditions Survey Professional Development construct and School Performance Grade score.

**Descriptive Statistics**

In North Carolina, 116 school systems were identified that had a minimum of one elementary, middle, and high school with available data from both the North Carolina Teacher Working Conditions Survey, and a school performance grade score. For each distinction of elementary, middle, and high school, one was chosen randomly by numbering each eligible school in said category and utilizing a random number generator to select each of the 348 total schools. The professional development construct score from the Teacher Working Conditions Survey was used as the predictor variable, \(X\), and the school performance grade as the criterion variable, \(Y\). The sample mean and standard deviation, as well as the minimum and maximum for both variables are reported in Tables 1, 2, 3, and 4.

**Table 1**

*Descriptive Statistics: Elementary School*

<table>
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Table 2

*Descriptive Statistics: Middle Schools*

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Table 3

*Descriptive Statistics: Middle Schools without outlier*

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</table>

Table 4

*Descriptive Statistics: High Schools*

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</thead>
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The researcher conducted data screening on each of the variables to detect inconsistencies and outliers. The data was scanned for errors and duplicate entries but no inconsistencies were
found. The z-scores were calculated using SPSS and were examined. In the data sets for elementary schools and high schools no univariate outliers were detected based on the fact that none of the corresponding z-scores were less than -3.300 or greater than 3.300 (Warner, 2013). However, upon examination of the z-scores for middle school students, one value fell outside the -3.300 to 3.300 range. Due to the large impact outliers have on Pearson product-moment correlations, this researcher conducted analysis both with and without said outlier to offer a complete picture of what the data represented.

**Assumptions**

The Pearson product-moment correlation coefficient or Pearson’s $r$ is an appropriate choice to describe statistically the relationship between teacher perception of professional development and school performance grade scores if certain assumptions are met (Warner, 2013). The data used for this study represented a random sample, the scores for both $X$ and $Y$ were quantitative, and the scores for both $X$ and $Y$ were independent of each other.

The assumption of linearity was evaluated with a scatter plot between the professional development construct score and the school performance grade score for all four cases. The scatterplots showed that the points were meaningfully represented by the line of fit, showing a linear relationship (see Figures 1,2,3,4). The assumption of linearity was not violated.
Figure 1. Scatter Plot of Elementary School Professional Development Construct and School Performance Grade with Line of Fit.
Figure 2. Scatter Plot of Middle School Professional Development Construct and School Performance Grade with Line of Fit.
Figure 3. Scatter Plot of Middle School without the outlier Professional Development Construct and School Performance Grade with Line of Fit.
Figure 4. Scatter Plot of High School Professional Development Construct and School Performance Grade with Line of Fit.

The assumption of homoscedasticity centers on the idea that “the variance of $Y$ scores should be the same at each level of $X$” (Warner, 2013, p. 164). Using the scatterplots for a visual analysis (see Figures 1,2,3,4), this researcher determined that the assumption of homoscedasticity was met.

Histograms of each variable in all four cases; elementary school, middle school with and without the identified outlier, and high school, were used to check for univariate normal distribution. Histograms showed that the score data represented by each variable were normally distributed (see Figures 5 through 12). Scatterplots were examined to evaluate the assumption of bivariate normal distribution. The scatterplots (see Figures 1,2,3,4) clearly showed that the $Y$ scores were normally distributed for $X$ and the $X$ scores were normally distributed for $Y$ by the
elliptical distribution (Warner, 2013). The assumptions of both univariate and bivariate normal distribution were not violated.

**Figure 5.** Histogram of Elementary Professional Development Construct Scores.

**Figure 6.** Histogram of Elementary School Performance Grade Scores.
Figure 7. Histogram of Middle School Professional Development Construct Scores.

Figure 8. Histogram of Middle School Performance Grade Scores.
Figure 9. Histogram of Middle School without Outlier Professional Development Construct Scores.

Figure 10. Histogram of Middle School without Outlier School Performance Grade Scores.
Figure 11. Histogram of High School Professional Development Construct Scores.

Figure 12. Histogram of High School Performance Grade Scores.
Results

Results for Null Hypothesis One

A Pearson product-moment correlation was performed to determine the relationship between teacher perception of professional development and school performance in elementary schools. The scatter plot (see Figure 1) indicated a positive linear relationship. The correlation between teacher perception of professional development and school performance was not statistically significant: $r(114) = 0.177$, $p = 0.058$ (see Table 5). The effect ($r = 0.177$) is considered small (Warner, 2013). The value of $r^2 = 0.031$ indicates that approximately 3% of the variance in school performance can be accounted for by the teacher perception of staff development. Since the $p$ – value ($p = 0.058$) is more than the threshold alpha ($p \leq 0.05$), the null hypothesis failed to be rejected.

Table 5

<table>
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<tr>
<th>Teacher Perception of PD</th>
<th>Pearson Correlation</th>
<th>School Performance Grade</th>
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</tr>
<tr>
<td>$r^2$</td>
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<tr>
<td>$p$ - value</td>
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<td></td>
</tr>
<tr>
<td>$N$</td>
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</tr>
<tr>
<td>$df$</td>
<td>114</td>
<td></td>
</tr>
</tbody>
</table>

Results for Null Hypothesis Two

A Pearson product-moment correlation was performed to determine the relationship between teacher perception of professional development and school performance in middle
schools. The scatter plot (see Figure 2) indicated a negative linear relationship. The correlation between teacher perception of professional development and school performance was not statistically significant: $r(114) = -0.106, p = 0.258$ (see Table 6). The effect ($r = -0.106$) is considered small (Warner, 2013). The value of $r^2 = 0.011$ indicates that approximately 1% of the variance in school performance can be accounted for by the teacher perception of staff development. Since the $p$ – value ($p = 0.258$) is more than the threshold alpha ($p \leq 0.05$), the null hypothesis failed to be rejected.

Table 6

<table>
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<tr>
<th>Teacher Perception of PD</th>
<th>Pearson Correlation</th>
<th>$r^2$</th>
<th>$p$ - value</th>
<th>N</th>
<th>$df$</th>
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</thead>
<tbody>
<tr>
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<td>0.258</td>
<td>116</td>
<td>114</td>
</tr>
</tbody>
</table>

**Results for Null Hypothesis Two – Without the Outlier**

A Pearson product-moment correlation was performed to determine the relationship between teacher perception of professional development and school performance in middle schools while removing the single outlier. The scatter plot (see Figure 3) indicated a negative linear relationship. The correlation between teacher perception of professional development and school performance was not statistically significant: $r(113) = -0.159, p = 0.09$ (see Table 7). The effect ($r = -0.159$) is considered small (Warner, 2013). The value of $r^2 = 0.025$ indicates that approximately 2.5% of the variance in school performance can be accounted for by the teacher
perception of staff development. Since the $p$ – value ($p = 0.09$) is more than the threshold alpha ($p \leq 0.05$), the null hypothesis failed to be rejected.

Table 7

<table>
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<tr>
<th>Teacher Perception of PD</th>
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<th>$p$ - value</th>
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<tbody>
<tr>
<td></td>
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<td>0.025</td>
<td>0.09</td>
<td>115</td>
<td>113</td>
</tr>
</tbody>
</table>

Results for Null Hypothesis Three

A Pearson product-moment correlation was performed to determine the relationship between teacher perception of professional development and school performance in high schools. The scatter plot (see Figure 4) indicated a positive linear relationship. The correlation between teacher perception of professional development and school performance was not statistically significant: $r(114) = 0.076$, $p = 0.419$ (see Table 8). The effect ($r = 0.076$) is considered small (Warner, 2013). The value of $r^2 = 0.006$ indicates that approximately 0.6% of the variance in school performance can be accounted for by the teacher perception of staff development. Since the $p$ – value ($p = 0.419$) is more than the threshold alpha ($p \leq 0.05$), the null hypothesis failed to be rejected.
Table 8

<table>
<thead>
<tr>
<th>Teacher Perception of PD</th>
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<td>0.006</td>
<td>0.419</td>
<td>116</td>
<td>114</td>
</tr>
</tbody>
</table>

Summary

After analyzing the data, the researcher was not able to reject any of the three null hypotheses for the research question: Is there a significant relationship between the educator perceptions of professional development and school achievement in North Carolina public schools. This question was measured by the North Carolina Teacher Working Conditions Survey professional development construct score and the school performance grade score. The chosen statistical analysis of the Pearson’s product-moment correlation found no statistically significant relationship between the given variables. With the level of correlations being represented by significance scores of 0.058, 0.258, 0.09, and 0.419, this researcher failed to find any significant relationship between teacher perception of professional development and school achievement.
CHAPTER FIVE: CONCLUSIONS

Overview

Chapter Five of this paper serves as the concluding chapter. Chapter Five begins with a discussion that reiterates the purpose of this study. Results were then used to examine the research question. Literature was used in order to compare the results from this study to studies previously mentioned in earlier chapters. Chapter Five continues with implications from this study and how this study added to the existing body of knowledge and can help to improve education. Next, this chapter continues with limitations that may have impacted the validity of this study. Chapter Five concludes with a detailed section of recommendations for future research. This researcher provided ideas for additional considerations for studies, changes, and additions that may help to further find significant relationships beyond what was found in this study.

Discussion

The purpose of this study was to determine if a significant relationship exists between educator perceptions of the professional development they receive as measured by the North Carolina Teacher Working Conditions Survey professional development construct score and school achievement as measured by that corresponding school’s school performance grade score. The research question for this study was: Is there a relationship between educator perceptions of professional development and school achievement in North Carolina public schools? The results of this study as represented by the three null hypotheses, all based on the aforementioned research question yet disaggregating it into elementary, middle, and high school data sets yielded no significant relationships.
The lack of a significant relationship being present in any of the three null hypotheses conflicts with some findings of prior research. A study in 2009 that used the North Carolina Teacher Working Conditions Survey found that working conditions can predict mathematics achievement and to a lesser extent reading achievement (Ladd, 2009). With this study focusing on the specific working condition of professional development and comparing it with overall school achievement, which includes mathematics and reading, inconsistencies in findings can be expected when the full scope of what is included in this study’s variables is considered. With reading being a lesser predictor for Ladd (2009), the inclusion and participation of all subjects and grade levels in this study, as well as a more focused use of a single working condition may explain the lack of significant findings.

Ladd’s study did have a conclusion that mirrored a part of the findings from this research. It was found that higher ratings for professional development yielded negative achievement correlations (Ladd, 2009). This research found negative correlations between teacher perceptions of professional development and school achievement in both middle school data sets, with and without the identified outlier. While the results of this study were not significant, it is noteworthy to mention this as Ladd (2009) found a similar negative relationship.

A 2011 study found that positive working conditions were a factor in improved student achievement (Johnson et al., 2012). While this study found significant results relating positive working conditions and improved student achievement, it is again important to note that the broad category of working conditions was explored and it was related to improved student achievement. This study used a single factor of working conditions and utilized a criterion variable that was only represented with 20% of its value derived from growth, or improvement. It is noteworthy to mention that while no significant relationship was found, two of the three null
hypotheses, elementary and high school, showed a positive linear relationship. These positive linear relationships, while not significant, represented the idea that higher perceptions of professional development correlated to higher school achievement.

Another study published in 2012 that utilized TELL data, which is the same tool as the North Carolina Teacher Working Conditions Survey, found that teachers who worked in a more supportive environment had greater rates of increased test scores. This was opposed to teachers working in a less supportive environment (Johnson et al., 2012). Once again, this 2012 study, while focusing on a similar idea was not directly comparable to this researcher’s study. A supportive environment is a factor of a working conditions and increasing test scores is related to achievement but is not the same as perception of professional development and a school performance grade score. It is important to note that while the studies are different, the parallel of working conditions and achievement was still present.

An experimental study based on targeted professional development with clear goals was conducted to see if a significant increase in reading achievement could be shown (Van Kuijk et al., 2015). This study was able to show a significant relationship between intentional design and execution of goal oriented professional development and increased achievement. The specificity of both the predictor and criterion variables in this case highlight differences between the experimental study and this study. Focusing on professional development designed for a need and measuring that specific area of student achievement and growth may account for the significant results obtained vice the lack of significant results obtained in this researcher’s broad study.

A 2015 study concluded that sustained, job-embedded professional development efforts may lead to improved student achievement in mathematics. While Althauser’s study is related to
the research of this study, there were notable differences. The data represented in this study may or may not reflect professional development that was both sustained and job embedded. The narrow focus of Althauser with mathematics represents only a small portion of the school performance grades used for the criterion variable in this study. Furthermore, the NCTWC survey data used, represented all teachers who volunteered to take the survey, opening the data set to all disciplines regardless of the focus of their school’s professional development. This is important because it represented a broad, school based view of professional development as opposed to a specific department’s view.

A study published in 2014 using 2012 TELL data found that four specific areas of the survey were significant predictors to student value-added gains (Kane et al., 2014). Professional development was one of the four areas found to be a significant predictor of student value-added gains. With value-added gains looking at how students learn over a defined period of time, growth is an important element. This 2014 study separated the TELL constructs and looked for a predictive relationship between each one individually and value-added gains. While this researcher focused on one of the TELL constructs that was found to be significantly related to value-added gains, it failed to yield significant results with regard to school achievement as defined by a school performance grade score. Similar to previous studies, the broad criterion variable used in this researcher’s study may explain some of the discrepancy in results.

This study attempted to narrow the focus of previous research found in literature, while also taking a broad look at school achievement. While the area that was narrowed dealt with the single working condition construct, professional development perception, most other studies had a narrower criterion variable that allowed for a singular focus, where this study attempted to quantify the broad idea of school achievement. While this may explain some of the discord
between results from previous literature to this study, it also creates opportunities for future studies to be designed and completed in an attempt to find significant relationships similar to those sought in this research.

**Implications**

While the results of this study did not yield a significant relationship, this study should still serve as an important piece of literature in furthering future studies and research. This study, regardless of an absence significant findings, sheds a light on the lack of importance paid to adult learning theory and design needs with regard to professional development in our education systems. This study attempted to look for a broad, general relationship between teacher perceptions of professional development and school achievement built over the foundational theory of andragogy. Andragogy’s important relationship with adult learning in the area of professional development is a topic that is not focused on enough in research nor in practice.

Existing data shows the high cost of professional development, an average of $18,000 per teacher, per year in 2014 (McGovern, McGovern, & McGovern, 2015). Existing data can also be cited to show a lack of growth and progress in America’s schools. One example of this are the 2015 PISA exam scores reported an 11-point drop in mathematics and stagnation in reading and science compared with 2012 scores (Jackson & Kiersz, 2016). Countless previous studies look for both broad and narrow answers to the problem of educational achievement. Many of these studies acknowledge and include professional development as causes and possible solutions.

Literature exists that focuses on the importance of adult learning theory. Yet much of this literature focuses on adult learning in a setting isolated from professional development. The idea and theory that adults learn differently than children is not new, yet is often not included in
studies and research pertaining to professional development, a key time and place where adults are learning. This study adds to literature by designing research that bridges the gap between traditional studies focused on best practices in professional development and true adult learning theory, andragogy. Best practices in professional development many times mirror the tenants of andragogy, but do not always include all or refer to the framework of andragogy by its theoretical name. This study attempts to raise awareness of the importance of seeing best practices in professional development design, implementation, and delivery through a framework of adult learning. Raising awareness to a lack of understanding of adult learning theory by those who are professional developers is critical in addressing the larger problem that is poor achievement and a lack of growth.

One final implication that this study brings to light is the extreme variance in definitions and terminology regarding professional development and terms including but not limited to high quality professional development. The vast differences between meanings, terms, and perceptions of effectiveness within this area of education is something that must be both addressed and minimized before significant change and progress can be realized. Without standard definitions and measurements of effectiveness, comparisons and reviews are not possible. Professional development is seen as the only tool districts have to strengthen educator performance levels and the only way educators can learn to help raise student performance levels (Mizell, 2010). With this high amount of importance placed on professional development, the term and all related terms and ideas involving it need to be clearly and consistently defined to aid in future use, implementation, and research.

This study should serve as a framework for similar studies with different designs. Later in this chapter the recommendations for future research offers ideas for how others can attempt
to adjust this design or use a different design in an attempt to achieve significant results. The results of this study should not be the major take-away. The major addition this study provides is the knowledge of the importance of understanding and incorporating adult learning theory into professional development, which by its nature is a learning experience for adults.

**Limitations**

All research will encounter limiting factors at various stages of said research. This study, while grounded in sound theory and design was not immune to such limiting factors. The availability of data and choice of which data sets to compare may have impacted results. The North Carolina Teacher Working Conditions Survey is only conducted every two years during a predetermined window that typically spans from mid-March until early-April. When this is coupled with the increasingly high teacher attrition rate in North Carolina, which rose to 14.84% in school year 2014-2015 (*Turnover Report*, 2015), deciding on which data sets to pair for predictor and criterion variables was a challenge. The NCTWC Survey is given late enough in the school year to capture some efforts and results of professional development given during that calendar year, yet may not give enough time to see tangible gains on student or school achievement based on that professional development. Pairing the criterion variable of a school performance grade which includes standardized assessment with teacher perceptions from that year of professional development is a logical choice regardless of the lack of time to realize results. This may however, not allow full implementation of professional development initiatives to have been completed, nor ample time for changes in practices to be realized.

Choosing different years of data presents its own set of possible limitations. With the aforementioned 14.84% attrition rate, waiting one year for data in school performance will have a reflection of work completed by a significant percentage of teachers who did not participate in
the measured professional development. Completing a study over time will further dilute the original population of teachers making direct comparisons for significant findings even more difficult. Without knowing specific professional development plans and implementations as well as specific teacher attrition rates at every school with available data made it impossible to find the perfect data set. Therefore, regardless of the imperfections of the chosen data sets, they represent a consistent and appropriate data set for what was studied.

Another limitation that should be referenced are the differences in data used for the three null hypotheses. The criterion variable for each null hypothesis used different standardized assessments to account for 80% of the school performance grade score. While this was necessary based on each null hypothesis pertaining to either elementary, middle, or high schools, it is worth noting in this section that each school performance grade score for the level of schooling involved a different amount of disciplines and grade levels. With some grades and subjects not being tested, there is no way to disaggregate the predictor variable to only include those teachers who directly affect the criterion variable. While this format allows for a wide data set of overall school perception of professional development and school achievement, it does not allow for a singular one to one relationship between those teaching the tested subjects and courses to the achievement they affect. It should also be mentioned that while encouraged, the teacher working conditions survey is optional in its participation. While traditionally, participation rates are high for the survey, 2016 had an 85.46% participation rate (North Carolina Teacher Working Conditions Results, 2016), there is no way to disaggregate participation in a meaningful way. This can be summarized to mean that there is no way for the researcher to know if those who received subject specific professional development and those who teach tested subjects are reflected in the working conditions results.
One further yet important limitation is the inherent overwhelming number of possible variables present within the scope of this study. As previously mentioned the criterion variable consists of multiple standardized assessments as well as a growth factor that encompasses 20% of the school performance grade score. This means that data was gathered to represent two years of data, collected from different student populations, who may have been taught by different teachers. The possibility for variance and inconsistencies in this case is present. Coupling these additional underlying variables with the predictor variable is notable as well. As previously mentioned, professional development initiatives may not be targeted for entire staffs, programs, or grade levels. While all staff members have the opportunity to participate in the working conditions survey every two years, if a school-wide initiative is focused on improving mathematics performance and the majority of professional development was designed to meet that goal, many staff members will not see the andragological benefits of such an initiative and may not have positive perceptions of said development regardless if significant school achievement gains occurred.

**Recommendations for Future Research**

The intent of this study was to determine both if a relationship existed between a teachers’ perception of professional development they receive and school achievement as well as determining if there existed differences in the strength of that relationship when comparing elementary, middle, and high school settings. The use of the teacher working conditions survey as well as school performance grade score were valid choices of instruments and data sets during the design of this study. Selecting a random elementary, middle, and high school from each county in North Carolina allowed for a large population size with which to analyze data. While
this researcher stands by the choices made in design and analysis, future research can still be completed to further analyze and quantify this possible relationship.

While the North Carolina Teacher Working Conditions Survey is a valid and reliable tool that contains a specific construct devoted to perception of professional development, this tool is only partially aligned to the adult learning theory tenants which are foundational to the framework throughout this study. Developing a valid and reliable tool to measure an adult’s satisfaction with and perception of professional development by following and accounting for the six assumptions of Knowles’ theory may better align to the relationship being sought. While the Teacher Working Conditions professional development construct represents some parallels to Knowles’ theory, the equal weight of all 13 questions in this study to create the construct score may have impacted results.

A possible adjustment to the predictor variable is not the only adjustment to be considered. While the school performance grade score is a combination of standardized assessments and a growth factor, which allow for a broad study of both achievement and improvement, both of which relate to professional development, other measures may be considered. The school performance grade score is very broad and includes standardized assessment from multiple disciplines. These standardized assessments may not measure or focus on the same areas that were focal points of professional development offerings for that year or a series of years. This study was conducted in a broad fashion in hopes of obtaining a general relationship with overall perception of professional development and school achievement. If specifically targeted professional development was offered in a school, then having the criterion variable represent the discipline with which the development addressed may yield a better result and a stronger, more significant relationship.
The research design could also be looked at for a different approach. A case study may yield important findings regarding the relationship between professional development and school achievement. This would allow the researcher the ability to document and follow the full process of professional development needs, design, implementation, and follow-through in a way for a researcher to identify and quantify the fidelity with which Knowles’ adult learning theory was incorporated and how that level of incorporation relates to the improvement in achievement. This would require multiple case studies of similar populations in order to compare adult learning incorporation with the possible impact that had on school achievement in the corresponding area of professional development. While this is a more complex study, it would allow a researcher to gather important, detailed, data while giving the freedom to focus the study solely on how adult learning was considered in professional development and the corresponding results of said PD. This could be done with or without changing the predictor variable from teacher perception of professional development to something involving adult learning fidelity. If the researcher decided to add the additional variable of adult learning fidelity, more relationships could be explored between that and teacher perceptions to gauge if teachers do view professional development designed and implemented with adult learning principles in mind more favorably or not. Regardless of the specifics of a case study or other future studies it is clear that additional research is needed.

Additionally, it should be reiterated that Lucilio (2009), emphasized the lack of experimental studies regarding aspects of PD and student outcomes. While ethical issues could arise when dealing with experimental studies that affect students, there may be opportunities to create such studies. If multiple schools were identified having similar needs, beginning with a typical professional development approach at once school and implementing an adult learner
centered approach at another would allow for a viable control group and experimental group. Comparing results of a typical to an ideal professional development implementation could yield much needed experimental data.

Previous studies from Lucilio (2009), Capps, Crawford, and Constas (2012), and Glover, Nugent, Chumney, Ihlo, Shapiro, Guard, Koziol, and Bovair (2016) have indicated a need for research and studies relating professional development and student outcomes or achievement. This study attempted to further the body of knowledge in this area. While results did not offer significant findings, opportunities are available to expand upon and further this research. Following with the foundation and theoretical framework of andragogy remains in this researcher’s opinion as a crucial step in uncovering relationships between professional learning and achievement. Any method of research that uses this framework regardless of the instruments that are chosen may add to the field of study and should be considered.

“A bad strategy will fail no matter how good your information is. And lame execution will stymie a good strategy” (Gates, 1999, p. 4). It is clear through this research that the approach to professional development can and should be improved. Both the strategy and execution continue to be flawed as evidenced by a lack of growth in America’s schools. Just as teachers look at the age and developmental level of students they teach, professional developers need to realize that adult learners have unique needs that must be a part of the plan used for their education. Change and improvement will only be realized when a cohesive and consistent set of definitions within the educational system is adopted along with a strong focus on adult leaners’ needs. These types of systemic reforms to the approaches taken when educating teachers are the first step in using a better strategy with proper execution.
References

2016 READY Accountability Background Brief. (2016).
   http://www.ncpublicschools.org/docs/accountability/reporting/16bckgrndbrf.pdf

   http://dx.doi.org/10.1080/13554530.2015.1011346


   http://dx.doi.org/10.1080/03004279.2015.1122317


http://dx.doi.org/10.1080/0305764X.2011.625004


http://dx.doi.org/10.1007/s10864-007-9051-0


http://dx.doi.org/10.5539/ies.v9n1p141


http://dx.doi.org/10.1097/IYC.0b013e31825a1ebf


The Importance of Staff Development: Three Imperative Workshops for Teachers. (2010).

https://training4teachers.com/the-importance-of-staff-development-three-imperative-workshops-for-teachers/


