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Using distributed leadership to impact student achievement

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USING DISTRIBUTED LEADERSHIP TO IMPACT STUDENT ACHIEVEMENT

by

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Dedication

This dissertation is dedicated to my mother, Denice Pierro. She was my first teacher and biggest champion. I know she would have been proud.

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Thank you to everyone that has had a part in my dissertation journey. Without all of their assistance, coaching, and discussions, I would not have been able to complete this study at all.

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Abstract

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The purpose of this quantitative study is to examine the properties of the distributed leadership scores and to investigate whether the scores predict student test scores. This research was conducted during the 2019-2020 school year at Rowan University. The sample for this study will be selected from the principals from public school districts in New Jersey. Data was collected using one instrument with two parts: a pre-survey and Distributed Leadership Readiness Scale (DLRS) developed by Gordon (2005). SPSS 26 software was used to analyze the data and answer the research questions. While both linear regressions have significant variables impacting the NJSLA scores, the DLRS score was not one of the significant variables in the English and Math models. This means that the perceived distributed leadership readiness does not significantly impact the NJSLA scores for English or Math.

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Chapter 1

Introduction

The standards movement ushered in a new era of accountability for schools (Elmore, 2000). Schools are under increasing pressure to meet both national and state mandates. Since *A Nation at Risk,* schools have come under the scrutiny of the federal government. The Standards Movement including, *Goals 2000*, *No Child Left Behind, ESSA, and Race to the Top* have increased the federal government's role in education and have focused on raising test scores. These federal mandates have raised the stakes on schools to improve student achievement. Consequently, principals have been forced to wear many hats, including, but not limited to, instructional leader, assessment expert, budgeter, public relations expert, transportation director, disciplinarian, counselor, and facilities director. Schools have become too complex for a principal to run alone and trying to do so promotes principal burnout and turnover (Leithwood, Mascall, & Strauss, 2009; Murphy, 2005; Spillane, Camburn, Pustejovsky, Pareja, & Lewis, 2008). A principal's influence on improving student outcomes and achievement is second only to the classroom teacher (Leithwood, Louis, Anderson, & Wahlstrom, 2004). The principal plays a vital role in student and school success.

Principals benefit from assistance from staff members to handle the burden of government mandates. Distributed leadership may offer a promising approach to implementing and sustaining school improvement initiatives (Danielson, 2006; Elmore, 2000; Heck & Hallinger, 2010; Spillane et al., 2008). Even though distributed leadership has the potential to expand a principal's capacity, it remains an underutilized resource (Danielson, 2007). Using distributed leadership, teachers and staff are empowered to take

leadership roles for schools to reach their potential and create lasting change (Harris & Lambert, 2004). The principal is a key stakeholder in fostering distributed leadership because he/she must initiate the framework in which staff members can be most effectively utilized.

In addition, there are many important areas of school leadership that affect student life beyond the classroom. Teachers and staff serve as coaches, club and class advisors, and performing arts directors. Schools organize various events throughout the school year that are essential to the student experience. These areas are imperative in that they help students develop a sense of belonging in the school and improve school culture. This study will investigate the distributed leadership readiness by New Jersey principals, and its relationship with student achievement.

Problem Statement

Administrators can feel pressure from outside forces to make top-down decisions. Top-down decision-making is easier up front, but harder to sustain because it does not make an investment in establishing teacher buy-in to the mandates (Duggan, n.d.). Teachers are the ones who ultimately enact the policy in the classroom, so it is important that they are onboard with the decisions made. Low income or Title I schools experience more top-down management because of the heavy burden of state and federal mandates (Gonzales, 2016). In Title I schools, it may be even more important to embrace teacher leadership to gain and foster ideas that will help student achievement and enhance the student experience. Schools should embrace the knowledge, effort, and talent of all of its constituents in an attempt to raise student achievement and enhance the student experience (Chatwani, 2014). In order to effectively incorporate varying viewpoints and

ideas, principals may look to embrace structures that support shared leadership. Unfortunately, many schools still do not have the appropriate structures and supports to incorporate teachers into the decision-making process (Byfield, 2007). Although many principals and building leaders espouse the virtues of shared leadership, many teachers do not feel that it is practiced to the degree in which building leaders profess. This disconnect is important because it is the principal who would need to implement effective methods to include teachers in the decision-making process to establish buy-in and support for district initiatives. The effective methods for this study will be drawn from Elmore's five dimensions: mission, vision, and goals; leadership practices; school culture; decision-making; and evaluation and professional development (Elmore, 2000). Gordon (2005) conducted a factor analysis that condensed these dimensions into four: mission, vision and goals; school culture; shared responsibility; and leadership practices. The dimension of shared responsibility was developed when Gordon merged evaluation and professional development with decision-making (Gordon, 2005). These four dimensions will be used to determine a principal's perceived readiness for implementing distributed leadership. This study seeks to determine the role that perceived distributed leadership readiness relates to student achievement.

Purpose Statement

The purpose of this quantitative study is to examine the properties of the distributed leadership scores and to investigate whether the scores have a relationship with student test scores. The design of this research will be to analyze survey data from principals in New Jersey to determine their readiness and perceptions on distributed

leadership. This study will utilize quantitative data to attempt to answer each of the proposed research questions.

Research Questions

1. What is the level of New Jersey public school principals' perceptions about their distributed leadership readiness?
2. What characteristics predict a New Jersey principal's readiness score?
3. What is the relationship between principals' distributed leadership readiness score and student test scores?

Key Terms

The following are key terms that will be introduced throughout this paper. This section will clarify for the reader the definitions associated with each term because different terms can have different meanings in education compared to other industries.

Principal Capacity: The perceived knowledge, abilities, skills, and expertise of a school principal.

Distributed Leadership: The decision-making and practices of school faculty and staff in various roles and committees in the school, instead of a singular leader at the top of the school hierarchy system (Leithwood et al., 2009).

Professional Learning Communities: A group of educators that meets regularly, shares expertise, and works collaboratively to improve teaching skills and the academic performance of students (DuFour, DuFour, & Eaker, 2008; Hord & Sommers, 2008).

Communities of Practice: Groups of educators who share a concern, a set of problems, or passion about a topic, and who deepen their knowledge and expertise

in this area by interacting on an ongoing basis (Wenger, McDermott, & Snyder, 2002).

Learning Organizations: Organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together (Senge, 2006).

Student Achievement: Students meeting or exceeding expectations on the New Jersey Student Learning Assessment (NJSLA) in English (Grades 4, 8, 10) and Math (Grades 4, 8, Algebra I).

Principal Perceptions: The way principals view their own readiness and interactions regarding distributed leadership.

Significance of Research

This paper will research the relationship that distributed leadership has with student achievement. Principals in New Jersey were surveyed about their perceived distributed leadership readiness. The results of this research can be used by district leadership and policymakers to determine if implementing distributed leadership in schools can raise student achievement.

Distributed leadership is a growing field of interest. Professional organizations in New Jersey such as The New Jersey Principal and Supervisors Association (NJPSA) and The New Jersey Association for Supervision and Curriculum Development (NJASCD) have advocated for increased shared leadership in schools ("NJASCD / Overview," n.d., "NJPSA," n.d.). In addition, several qualitative studies have been conducted about the proposed benefits of distributed leadership on student achievement (Danielson, 2006;

Heck & Hallinger, 2010; Leithwood et al., 2010; Murphy, 2005; Spillane et al., 2008). As one of the leading states in the country in educational achievement, the impact of distributed leadership on student achievement in New Jersey can play an important role in determining school leadership policies and mandates in the rest of the country ("These U.S. states have the best education systems," 2018).

This study uses quantitative methods to attempt to answer the proposed research questions. More quantitative studies are needed to build the foundation of literature on distributed leadership (Leithwood et al., 2009). A survey was distributed to principals in New Jersey for this study. Demographic and school variables, and perceived distributed leadership readiness were collected. Data was collected using one instrument with two parts: a pre-survey (Appendix A) and Distributed Leadership Readiness Scale (DLRS) (Appendix B). The pre-survey contains demographic questions as well as school characteristic questions. The demographic questions ask principals to identify: gender; race/ethnicity; number of years of principal experience; and highest degree obtained. The school characteristic questions include percent of chronic absenteeism; student enrollment size; number of school staff; percent of students with free or reduced lunch; school locality (city, suburb, rural, or town), and percent of students meeting or exceeding expectations on the applicable English and Math New Jersey Student Learning Assessments (NJSLA) from the previous year. The survey data collects the distributed leadership readiness scale (DLRS), developed by Connecticut Department of Education in 2002 (Gordon, 2005). [1]

[1] Cronbach's alpha was estimated to be .86 suggesting a respectable level of consistency (Gordon, 2005)

Literature on Leadership

School leadership is important for improving the outcome for schools and its students (Karadağ, Bektaş, Çoğaltay, & Yalçın, 2015; Witziers, Bosker, & Krüger, 2003). There are leadership strategies and theories that transcend organizations and industries (Murphy, 2015b). Leadership is one of the most important components of school performance because it is the leader who sets the conditions for the school's culture, mission, vision, and goals (Menon, 2013). The principal is second only to teacher quality for impacting student achievement (Leithwood et al., 2004). Effective principals know they need the help and support of the entire school community to be successful. These principals heed the advice of key leadership theories like servant, transformational, and transformative leadership (Burns, 1978; Greenleaf, 1977; Shields, 2010). Effective school leaders must also champion social justice and students' rights in order to elevate students and give them the opportunity to reach their full potential (Freire, 2000; Shields, 2010). These leadership styles transcend organizations and industry. Many of these leadership theories imply a strong central leader, however leaders may be made more effective by sharing leadership and decision-making with colleagues.

Distributed leadership. Despite the widespread interest in the concept of distributed leadership, there are competing and conflicting interpretations of the term (Harris, 2008). Today, distributed leadership has become synonymous with several leadership concepts such as shared, collaborative, democratic, and participative leadership (Harris, 2008). Distributed leadership is the idea that leadership does not belong to one person or title, but rather leadership is a fluid and emergent property that encompasses the efforts of several or all members of an organization (Elmore, 2000). For organizations to be

successful, they must embrace the collective knowledge and effort of all stakeholders in the organization.

Schools should embrace the knowledge, effort, and talent of all its constituents to raise student achievement (Spillane et al., 2008). Traditionally, the principal has been viewed as the authoritative figure in the school. In today's school climate, principals struggle with their role definition (Byfield, 2007). Once seen as bureaucratic executives, principals are now expected to be instructional leaders. For principals to actualize this ability, they need to practice distributed intelligence. Distributed intelligence is the recognition that our intelligence is not limited to what we know as individuals, but rather it is determined by how we identify and use the resources of the people around us (Hoerr, 2005). Research on school leadership suggests that both principal and teacher leadership are important for school improvement (Sebastian, Huang, & Allensworth, 2017).

Principals willing to delegate control will find that they are not so bound by the need to do everything themselves (Grogan, 2013; Spillane et al., 2008). Principals practicing distributed leadership exercise leadership skills and knowledge to divorce themselves from the traditional role of the principalship and replace it with one that views administrators and teachers as partners (Byfield, 2007). Marzano et al. (2005) identify the need for the principal to create strong school leadership teams. He calls this distributed leadership model purposeful communities (Marzano et al., 2005). This concept explains how leadership is developed and maintained by shifting school leadership from a single individual to a team of educators.

Distributed leadership fosters a collaborative work culture. When leadership focus is team-oriented rather than authoritative, school improvement is more likely to occur and

be sustainable (Byfield, 2007). Pounder (as cited in Whitaker & Gruenert, 2015) states that making schools collaborative involves changing the nature of the relationships in the school. Strong leaders understand that leadership is about relationships (Hoerr, 2005). A positive impact on school culture can be achieved when the traditional hierarchy of leadership is shifted to a culture of collaborative decision-making and shared leadership (Byfield, 2007).

Leadership versus management. Despite the current view of the principalship, being a principal involves more than just being an instructional leader. In addition to the role as instructional leader, principals are also charged with the responsibility for management and administration of the school (Grissom & Loeb, 2011). Murphy (2015b) describes the concept of operational leadership. Operational leadership can sometimes be dismissed as management, however operational leadership is important to hold all the other aspects of leadership together. School leadership can include the component of operational leadership and involve more individuals than just people with formal leadership positions; it should involve individual teachers who are not formally designated as leaders (Spillane et al., 2008). In addition to curriculum, instruction, and assessment, teacher voice can be utilized to improve management functions of the school. In several states, teacher unions have given teachers a strong voice on many management issues (Hoerr, 2005). In these instances, it is wise of a principal to include union leadership on as many building management decisions as possible. The principal functions as a strong cohesive force to lead and manage the school on a number of fronts.

Spillane et al. (2008) state that distributed leadership is the interaction of leaders, teachers, and the situation as they influence practice. Although Spillane et al. (2008)

believe leadership that focuses solely on the principal and tying leadership to a particular administrative position is short-sighted, it is necessary to focus on the principalship because it will ultimately be the principal who is responsible for instituting a distributed leadership strategy (Harris & Lambert, 2004). Implementing a distributed leadership strategy in this era of high stakes accountability associated with education today takes a great deal of courage.

Leadership for change. School leadership is often portrayed as a catalyst for change (Hallinger & Heck, 2010). Leadership for change requires pluralized leadership with teams of people creating and driving a clear, coherent vision (Marzano et al., 2005). Principals can work to reorganize schools into collaborative work cultures (Lortie, 2002). Expansion of leadership beyond the principal has the potential to reshape the administrator's role so that power and authority are shared with other staff in a non-threatening way. This shared power and authority can provide the catalyst necessary for increased organizational commitment to work toward a common focus (Byfield, 2007). Such collaborative work cultures replace teacher isolation and break down management barriers (DuFour et al., 2008). This collaborative work culture and succinct vision embraces the idea that the smartest person in the room, is the room.

School reform efforts must address the culture of the school in order to be sustainable. Schlechty (as cited in Byfield, 2007) notes the importance of a culture that supports change. An organization's culture is its primary source of meaning and stability. Cultural support is necessary for change to survive (Schlechty as cited in Byfield, 2007). In order for a principal to be successful, the circle of leadership should always be expanding to incorporate the knowledge and motivation of the entire organization

(Fullan, 2011). Culture is the embodiment of the organization's values and behaviors. No matter how well-intended the school reform is, it will take time and consistency to see meaningful change.

One of the most important things a principal can do to create change is to develop a positive working relationship with the school faculty. The principal sets the tone for the school. The principal's behavior has a significant influence on the culture of the school. If schools are to reap the rewards of a trusting work environment, it is the principal's responsibility to build and sustain trusting relationships (Grogan, 2013). One of the greatest dilemmas faced by school leaders occurs when they do not trust the competence and motivation of their teachers. In these cases, the principal must work with the individual and the leadership team to develop these core competences.

Creating a faculty that works together as a team requires a different approach to management and leadership than in the past. Today's leadership requires trust, collaboration, and relationship building (Hoerr, 2005). School goals are usually top-down mandates and teachers are given little leeway in identifying goals and the strategies to improve (Hoerr, 2005). However, when an administrator solicits ideas and opinions from the staff, it signals that they are on the same team (Hoerr, 2005). A positive and healthy school culture translates into increased teacher job satisfaction and productivity (Byfield, 2007). By leveraging distributed intelligence of the entire building, the principal is more likely to foster an environment that supports instructional leadership and efficient building management.

Conceptual Framework

Schools are complex organizations that must meet the needs of many competing stakeholders and policies. Principals must organize the school's resources of time, space, and personnel to enhance student learning (Danielson, 2006). Distributed leadership gives principals a vehicle to move away from the heroic singular leader framework, and work to include all stakeholders in the leadership process (Danielson, 2006; Elmore, 2000; Spillane, 2006). Leaders are generally evaluated by outcomes, but the process of achieving these outcomes is also important to study. This paper will examine the relationship between distributed leadership and its outcome, student achievement.

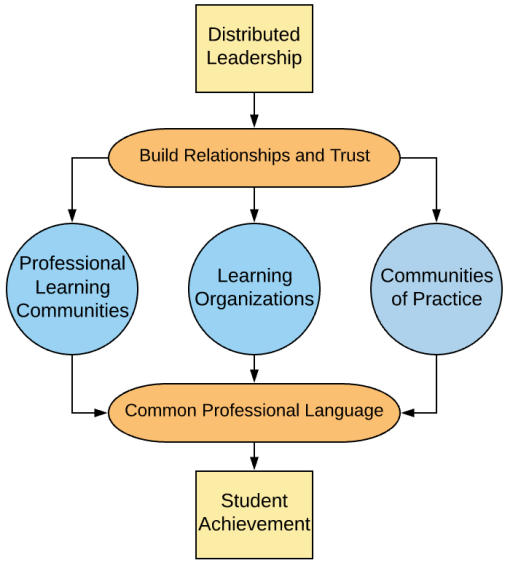

Figure 1. How distributed leadership influences student achievement.

Figure 1 shows how learning organizations, communities of practice, and professional learning communities serve as a bridge that connects distributed leadership and student achievement. Principals need a framework to initiate a distributed leadership

model. As the instructional leader of the school, the principal must ensure that conditions are present to continuously improve student achievement. The principal needs to promote schools as learning organizations to expand the capacity of the school staff and create a lasting mission and vision for the school (Murphy, 2015a; Senge, 2006). In order to facilitate a school's transformation into a learning organization, principals can establish professional learning communities (PLCs) and communities of practice.

People do not work in a vacuum and need new ways to engage with each other that harnesses their talents and motivation (Lester & Kezar, 2017; Murphy, 2015a; Senge, 2006). Schools need all stakeholders to contribute to meet the challenges of an always-evolving society (DuFour et al., 2008; Wenger et al., 2002). In order to keep up with these changes, schools must be learning organizations that pull from the collective intelligence of its members (DuFour et al., 2008; Elmore, 2000; Robertson, 2015; Senge, 2006; Wenger et al., 2002). Schools should establish a culture, mission, and vision based on shared responsibility and leadership to raise student achievement. Schools rely on teamwork and the interdependence of its members. This idea runs contrary to how most people, even teachers, sometimes view schools. The idea of a teacher being an autonomous entity that closes the door and goes to work is an illusion (DuFour et al., 2008; Hord & Sommers, 2008). This idea of interdependence is essential to making schools thrive.

Communities of practice and professional learning communities offer schools a way to transform into learning organizations. By adjusting the organizational framework to focus on distributed leadership and decision-making, schools can create a sense of ownership within the organization and motivate all stakeholders to work together to

obtain the organization's goals. It is only through all dimensions of the organizations working harmoniously that organizations can have sustainable results.

While considering the conceptual framework, it is important to also consider the process and implementation of distributed leadership that may influence potential outcomes. Relationships are a key component of leadership, and the premise of distributed leadership is that leaders should embrace the collective intelligence of staff to lead the organization. In order to implement the conceptual framework, it is important for principals to promote teacher leadership, build trust, and meet the social and economic needs of the community in which they serve. Leaders must have trust in the staff to perform leadership roles, and staff must trust the leader to be given the autonomy to make decisions if distributed leadership measures are to take root.

Methods

This study utilizes a quantitative design to answer the research questions. Quantitative methods allow study results to be generalized and applied to other studies on the topic (Creswell & Creswell, 2017). In order to address the research questions, principals in New Jersey are asked to complete a Distributed Leadership Readiness Scale survey.

Sample. The sample for this study is selected from the principals of public school districts in New Jersey. The state of New Jersey has both public and private schools; however, this study only uses public school districts. In addition, charter schools are not included in the study in order to maintain consistency of the results. Elementary, middle, and high schools are included in the study.

New Jersey is comprised of 2,533 public schools in approximately 690 school districts ("New Jersey Public Schools Fact Sheet," n.d.). There are 306 schools that only consist of grades lower than 4th grade. These schools are not included in the survey distribution because there is no standardized NJSLA test below 4th grade. As a result, the survey was emailed to 2,227 public school principals in New Jersey using Qualtrics software. I received 201 completed surveys, which is a response rate of about 9%. As a result, statistical analyses I perform using this sample do not necessarily have strong statistical power, which may lead to Type II error. Principals chose whether or not to respond to the survey, and this may have led to non-response bias. The people who respond to the survey will normally be different from those who choose to ignore the survey (Sackett, 1979).

The Distributed Leadership Readiness Scale survey. The Connecticut State Department of Education developed the Distributed Leadership Readiness Scale (DLRS) (Gordon, 2005). This scale was developed to determine a school's readiness to implement distributed leadership to enhance public schools' abilities to improve student achievement. A committee of educators reviewed the items on the DLRS and then the items were matched to one of the original five distributed leadership dimensions (Gordon, 2005). This activity established that the DLRS has face validity because the committee was able to review the items to conclude that the survey appears to measure the intended constructs.

In order to determine the feasibility of a full-scale use, the initial use of the DLRS employed the known-groups technique. Using this method, the DLRS was administered to four schools participating in the distributed leadership initiative, however, two schools

were considered high performing, while the other two schools were flagged as needing improvement. This ensured construct validity because the two groups of schools were expected to differ in student achievement. The results showed a direct relationship between the distributed leadership dimensions and higher student performance (Gordon, 2005).

To ensure reliability, Gordon (2005) used the internal consistency method. It is important to establish reliability to know that there is overall consistency of a measure. Gordon (2005) used the item-total correlation test to determine if any of the items had responses that varied from the responses to the rest of the items in that dimension. Gordon's (2005) results demonstrated that the DLRS is a reliable instrument that can be used in future studies with a Cronbach's alpha estimated to be .86.

Data analysis. Once the scores were calculated from the Distributed Leadership Readiness Scale survey, the mean for each dimension is used to understand New Jersey school principals' perceptions about their distributed leadership readiness. The reliability of responses is evaluated using the internal consistency measure, Cronbach's alpha. The overall Cronbach's alpha is 0.95, which shows excellent internal consistency. An exploratory factor analysis is performed to determine whether there are four latent distributed leadership factors aligned with the survey instrument's four domains including, mission, vision, and goals; school culture; shared responsibility; and leadership practices.

This study utilizes multiple regression analysis with school characteristics to isolate the relationship between distributed leadership readiness scores and student achievement scores from the influence of confounders. Multiple linear regression is best to use when

researchers need to understand how much a dependent variable changes when we change the independent variable (Creswell & Creswell, 2017; Kutner, et al., 2004; Lyman & Longnecker, 2008; Montgomery, 2012). In this study, the dependent variable is scores from NJSLA exams. The NJSLA math and English-language arts exams measures student proficiency with grade level skills, knowledge, and concepts for college and career readiness.

To determine which school and principal characteristics predict a New Jersey principal's readiness score, a series of multiple linear regression models were estimated. The initial model included principal characteristics; gender, race/ethnicity, number of years of principal experience, and highest level of education; as well as school characteristics; percent of chronic absenteeism, school enrollment size, number of school staff, percent of students with free or reduced lunch, and school locality (city, suburb, rural, or town). Subsequent models explored potential non-linear relationships between the number of staff and the DLRS score, as well as between the percent of free or reduced lunch and the DLRS score. Lastly, a series of multiple linear regression models were estimated to investigate if principals' perceived readiness has a relationship with student achievement. Student achievement was measured by using the percentage of students meeting or exceeding expectations on NJSLA scores from Grade 4 Math and English, Grade 8 Math and English, Algebra I, and English 10. The grade 4 and 8 NJSLA tests were used because they are universally reported on the New Jersey School Report Card. The Algebra I and English 10 NJSLA exams were the state graduation requirement in New Jersey when the survey was developed, which is why they were used to represent student achievement. Since the NJSLA measures student grade level proficiency, and

principals interact with students and teachers at each grade level, the relationship between DLRS results and student test scores should be constant across all grade levels.

Descriptive statistics were generated for the principal and school characteristics that were believed to have an impact on students' NJSLA achievement in order to gain an understanding of the range of values, mean, and standard deviation before continuing with analyses. After learning about the variables from the descriptive statistics, a series of multiple linear regression models were estimated to model the relationship between the perceived distributed leadership readiness and student outcomes for both English and Math NJSLA.

In addition to the Distributed Leadership Readiness Scale survey score, the school characteristic variables were included in the models. The models did not include the principal characteristics because the DLRS score reflects part of the principal characteristics. In addition, models were estimated to detect a possible non-linear relationship between DLRS and student achievement. It is possible that distributed leadership may have a non-linear relationship with student achievement. Schools that practice distributed leadership may be more likely to have structures in place to support professional learning communities (PLCs). Schools with PLCs may have a relationship with achievement that increases scores at a non-constant rate. Models are also estimated to detect a potential interaction effect between DLRS and the number of staff members. The value of the coefficient and significance may change if the number of staff is very large or very small because schools with these extreme sizes could lead to a different management experience for principals.

Summary

The literature and research conducted on the issue of distributed leadership as it relates to student achievement has been mostly qualitative. While this qualitative research is valuable and important to influencing policy, it is advantageous for policymakers to have quantitative data to support any policy decisions. This research study attempts to help fill that void and give policymakers important information to help understand student achievement in relation to principals' leadership styles.

Chapter 2

Review of Literature

The school reform movement has put increasing mandates on schools to raise student achievement. In parallel, leadership has increasingly been moving away from the idea of a singular heroic leader, and the literature promotes a more democratic approach (Luff, 2011; Spillane, 2006). Limited empirical research has been conducted to find a correlation between schools that promote a distributed leadership philosophy and student achievement. However, literature on professional learning communities, learning organizations, and communities of practice will show a road map to conceptualize the connection between the two topics. This literature review will synthesis the literature on distributed leadership including its foundation and leading theorist. Student achievement will look at how the standardization and school reform movements have affected how we define student achievement. The limited research connecting the two will be discussed and setup a rationale for this research project to expand upon. A conceptualized framework connecting distributed leadership and student achievement will be presented through an analysis on professional learning communities, learning organizations, and communities of practice.

Distributed Leadership

Distributed leadership theory has been hailed as a solution in educational circles to reform schools in an era of unparalleled accountability (Elmore, 2000; Ravitch, 2013; Spillane, 2006). In exploring this theory, the areas of transactional and transformational leadership, situational leadership, teacher leadership, and shared leadership will be discussed. Distributed leadership incorporates and expands on these areas of study.

Having a firm understanding of these theories allows us to better understand the development and origin of distributed leadership. Leadership literature is filled with examples of the singular heroic leader, but organizations have been deemed stronger when leadership is integrated throughout the organizations and multiple individuals have influence (Collins, 2001; Elmore, 2000; Murphy, 2015a; Spillane, 2006). Even in organizations with strong centralized leadership, it is hard to ignore the impact that coworkers and subordinates have on the leader (Gardner, 1987; Kelley, 1988; Rost, 1991; Spillane, 2006). In turn, leaders need to have followers develop into leaders to carry out the message to others in the organization. One of the key factors linking distributed leadership and student achievement is building trust (Bryk & Schneider, 2002). When there is a culture and climate of trust in schools, teachers and staff members will be more likely to take risks and share accountability (Maltempi et al, 2019). Therefore, researchers must expand their research to include not just a singular leader, but rather groups of individuals that carry the organization's mission and goals (Gibb, 1950; Kerr & Jermier, 1978).

In the 1980's, school leadership research shifted to focus from just the school principal to leadership exercised by teachers, change agents, and other stakeholders (Camburn, Rowan, & Taylor, 2003; Leithwood et al., 2009; Spillane et al., 2008). This shift was necessitated by educational reforms that embraced leadership roles for teachers like Career Ladders for Teachers, Site-based Management, and Teacher Mentor Programs (Ravitch, 2013). These reform movements, coupled with new research of leadership practice served as the backbone of the distributed leadership theory.

Transformational and transactional leadership. Transformational and Transactional Leadership have served as leadership philosophies that encapsulate many other leadership theories. Transformational leadership champions a clear and focused vision that is in the best interest of the organization (Burns, 1978; Luff, 2011; Shields, 2010). Transactional leadership is based on an exchange of capital or needs between the leader and the follower (Burns, 1978). Both transactional and transformational leadership acknowledge and implore the leader to motivate people to perform at a higher level within the organization.

Bass (1985) notes that transformational leadership does not require a hierarchy to be deployed. The goal of leadership can be seen to create and develop new leaders (Greenleaf, 1977; Luff, 2011). Building capacity in organizational members is important for the long-term success of the organization and leaders' employees to be self-motivated, self-reliant, and effective (Bass, 1985; Collins, 2001; Senge, 2006). Transformational leaders promote a culture where people can prosper and benefit the organization's goals and mission. This makes transformational leaders more effective in instituting change throughout the organization, because they are not doing it unilaterally or top-down (Hargreaves & Fullan, 2013; Leithwood et al., 2009; Shields, 2010). A significant difference between transactional and transformational leaders is that transformational leaders spend more time on building relationships and investing in others and less on bottom line tactics. For this reason, transformational leader has a small, but significant effect on student achievement (Sun & Leithwood, 2012). This inclusion of other leaders beside the building principal allows for teachers to take a more active role

in leading and managing building operations and distribute leadership responsibilities in the school.

Situational leadership. Situational leadership states that there is no one best style of leadership, but rather that the leadership style must be flexible to adapt to the task at hand (Hersey & Blanchard, 1987). Situational leadership is divided into quadrants based on the followers' readiness. The quadrants are directing, coaching, supporting, and delegating (Hersey & Blanchard, 1987). Hersey and Blanchard (1979) also defined the readiness of a follower as able and willing, able but unwilling, unable but willing, and unable and unwilling. If a follower was deemed able and willing or able but unwilling, Hersey and Blanchard defined those actions as follower directed. If the follower's readiness was deemed unable but willing or unable and unwilling, situational leadership declared the readiness, leader directed (Hersey & Blanchard, 1987). Hersey and Blanchard's Situational Leadership labels these four quadrants: Delegating, Participating, Selling, and Telling. Hersey and Blanchard attempted to match each follower's readiness with a leader's behavior. For example, if a follower is able and willing he/she needs little motivation and direction from the leader. The leader in turn can delegate responsibility to the follower with great confidence that the job will be completed satisfactorily. On the other end of the spectrum, if a follower is unable and unwilling then a leader will have to monitor every step of the process and use a telling leadership behavior.

There are many advantages to a leader practicing Situational Leadership, including flexibility and simplicity. Situational leadership may help principals implement distributed leadership by knowing who they can delegate and share leader with on the faculty. Teachers may have greater knowledge than the building principal on certain

aspects of the school that can be utilized to increase efficiency. A drawback of Situational Leadership is that it heavily relies on the leader's ability to appropriately judge the task. Misjudging the situation can lead to inconsistent communication and performance across the organization.

Teacher leadership. Teacher leadership is an important part of distributed leadership in schools. Teachers have the most contact with students, therefore, their influence on student achievement is greatest (Goddard, Hoy, & Hoy, 2000; Hattie, 2009; Rockoff, 2004). Teacher efficacy is the belief of teachers in a school that the efforts of the staff will have a positive effect on students. Rockoff (2004) found that a one standard deviation in teacher quality raises test scores approximately 0.1 standard deviation in reading and math. Distributed leadership gives teacher-leaders a chance to take on leadership responsibilities beyond their classroom. Distributed leadership promotes the idea of teacher leadership by given teachers a voice in the process and opportunities to collaborate with their colleagues.

Teacher leadership may be defined as a single or group of teachers that influence their cohorts, principals, and other members of the school community to improve teaching and learning practices to increase student learning and achievement (York-Barr & Duke, 2004, p. 287). During this time of school accountability, teacher leadership is needed more now than ever ("Teacher Leader Model Standards," n.d.; von Frank, 2011; York-Barr & Duke, 2004). During the last two decades, teacher leadership has held a central position in the ways schools operate and influence school achievement (Danielson, 2006; Murphy, 2005; Smylie, Conley, & Marks, 2005; Spillane, 2006). Many school reform initiatives have focused on recruiting, retaining, and developing highly

effective teachers and increasing their influence on school decision-making (DuFour et al., 2008; Fullan, 2010; Ravitch, 2013; York-Barr & Duke, 2004). The more power and influence a principal cedes to teachers, the school moves more to a democratic state (Barth, 2001; National Comprehensive Center for Teacher Quality, 2007; York-Barr & Duke, 2004). The more a school fosters a democratic environment that values collaboration, creativity, and communication the more teacher-leaders will emerge (Luff, 2011). Principals extend their own capacity when they foster teacher leadership and promote a community of learners (Barth, 2001, p. 445). Principals who practice teacher leadership have greater teacher commitment to school mission, community, and tend to have high student achievement (Ross & Gray, 2006). By extending their capacity, principals increase the potential for student achievement.

Shared leadership. Shared leadership involves principals sharing decision-making both formally and informally with the school staff. Shared leadership between principals and teachers involves several people working collectively on the shared vision and mission of the school. Shared leadership practice does not rely on the knowledge or skills of one leader, but encourages participation of several leaders who wield both formal and informal titles (Goksoy, 2016; Leithwood et al., 2009; Spillane, 2006). Organizations that foster shared leadership are composed of individuals that trust each other and are open to the exchange of ideas (Harris, 2003). Bolman and Deal (2013) liken shared leadership to a basketball team in which individuals make decisions and innovate in concert with their teammates. This type of leadership demands commitment to the school's shared values and beliefs. Although Spillane (2006; 2008) claims that distributed and shared leadership

are two separate models of leadership, many studies use the terms interchangeably because there are many similarities between shared leadership and distributed leadership.

Transactional and transformational leadership, situational leadership, teacher leadership, and shared leadership recognize that the principal must work with staff members in order to move the school forward and raise student achievement (Ross & Gray, 2006; Sun & Leithwood, 2012). Principals must share the decision-making in determining the mission, values, and practices of the school. Teachers have just as much invested in student achievement as the principal, therefore policies and procedures must be created and nurtured to create a democratic school culture.

Theories of distributed leadership. The previously discussed leadership theories laid the groundwork for additional theories to be developed in the current environment. The idea that leadership required more than just a singular leader to move an organization forward initiated the idea that followers can influence leaders as much as leaders influence followers. Distributed leadership theory has been heavily influenced by many researchers, but none more influential than Richard Elmore, James P. Spillane, and Peter Gronn.

Elmore. Elmore (2000) states that the primary focus of school leadership should be to improve instruction and that everything else is secondary. Elmore believes that leadership does not reside with individuals, but rather should be distributed among various groups that are accountable to each other including parents, teachers, students, and the community. Elmore (2000) researched leadership's impact on student achievement with regard to loose coupling and the standard-based reform movement.

Loose coupling describes how the isolated individual classroom gives teachers a great amount of discretion on what is taught and how it is taught. It creates a school culture where best practices do not take hold because teachers are buffered from outside influences (Elmore, 2000). This practice also allows for principals to shield teachers from outside influences, limiting their development and increasing isolation. Elmore (2000) states that when events are coupled they produce responsiveness. This coupling effect results in interdependence and creates a culture of accountability to each other and ultimately the student. The standards movement was viewed as a way to address the problems of loose coupling and have schools focus on student achievement.

The landmark education report *A Nation At Risk* helped lead in an era of school reform and standardization (National Commission on Excellence, 1983; Ravitch, 2010). *A Nation at Risk*, for all its hyperbole and bluntness, did not offer anything revolutionary in terms of education. In fact it is a grounded report that cites the need for robust instruction in the core areas of math, science, language arts, and history, and also discussed the need for vocational training, the arts, and world language (National Commission on Excellence, 1983). It sparked a public outrage over low student test scores, both nationally and internationally, in the areas of math and science (Ravitch, 2013). This public outcry changed the priorities of education and schools to boost student performance and directly linked student achievement with higher test scores (Ravitch, 2013). The test scores also highlighted the opportunity gap between White students and students of color (Bensimon, 2005; Fuhrman, 2004; Ravitch, 2010; Snell, 2003). This allowed social justice advocates to use the standards movement to address critical issues

in schools, which also led to a change in governance that promoted private, charter, and magnet schools (Ravitch, 2013; Tienken, 2016).

Elmore (2000) believed everyone in the school is responsible for the leadership in the school. He believed that shared leadership increases interdependence and makes everyone more accountable to each other and to the school. Elmore (2000) promoted five key principles to increase distributed leadership in schools. The first states that the purpose of leadership is to improve the instructional practice of staff members. The second principle promotes the idea that improvement requires continuous learning. This idea is found in professional learning communities, learning organizations, and communities of practice literature (DuFour et al., 2008; Senge, 2006; Wenger et al., 2002). The third idea states that in order for learning to occur, it must be effectively modeled. The fourth principle states that leadership should not be held merely by formal authority, but should be given to the person with the most expertise on the subject. Finally, he believed that there must be mechanisms in school to build leadership capacity and accountability. Principals and teacher-leaders are responsible for building the leadership capacity of the school. One of the goals of leadership should be to promote more leaders (Greenleaf, 1977). In order to implement improvements in the school, the school needs its stakeholders to work in concert with each other to share expertise and resources to drive the change.

Spillane. James Spillane and his fellow researchers worked to identify tasks, sanctions, and interaction of leadership that occur in daily interactions of the school. He believed that leadership entailed elements of leaders, followers, and situations. Spillane (2008) emphasizes a leader plus aspect where leadership is distributed across many

people. Leadership plus states that leadership is often enacted by those without formal leadership or authoritative positions. Leadership plus focuses on leadership activity rather than titles. Spillane et al. (2008) promotes four components of distributed leadership.

The first component is leadership and task functions that includes the development of a school vision that governs the interactions of the school leaders to tackle various tasks in the school. The second component moved this vision forward from one of recognition to one of action. It states that there is often a disconnect between a person's theory-in-use, what people say they do, and their theory-in-practice, or what they actually do (Argyris, 1990; Argyris & Schon, 1974; Spillane, 2006). The third component focuses on how leadership responsibilities are appropriated. Spillane believes, like Elmore, that tasks and leadership should not be reserved for people with formal titles, but rather should be divided up among people with formal and informal leadership roles as well as followers. This social distribution increases ownership and promotes accountability. The fourth component of leadership involves the situational distribution of leadership practice. This allows leadership to be distributed over various aspects of the issue and pull the resources of the organization to address the problem.

Situational distribution can be described in three ways: collaborated, collective, and coordinated. Collaborated distribution involves two or more people who work collaboratively together to solve a problem. Collective distribution involves two or more leaders who work separately, but the results are interdependent of each other. Finally, coordinated distribution entails the same aspect of collective distribution, but adds leadership that involves activities that must be performed sequentially (Spillane et al.,

2008). Spillane's research helps explain the usage and benefits of distributed leadership in the daily operations of the school.

Gronn. Gronn (2002b) views distributed leadership as embedded in activity. Activity theory fills many of the gaps that are missing in other leadership types and develops as a result of leadership practice (Gronn, 2002a). Activity theory promotes the idea that practice drives theory and is result driven, similar to Fullan's (2004) ready, fire, aim mantra. Gronn studies how people interacted and proposed that people should work collaboratively within a group to solve problems. Therefore, he believed that leadership should be shared within institutions (Gronn, 2000). Leadership often involves the effort to influence the motivation or practice of faculty and staff to improve instructional practice and outcomes. Distributed leadership in this context proposes that leadership is best understood through examining the leaders' actions enacted and the "theories-in-use" of the leaders (Argyris & Schon, 1974; Gronn, 2002b; Spillane, 2006). One of the key advantages of embedding activity theory in distributed leadership is that it allows for practical study and implementation of theory.

Distributed leadership is rooted in many other educational theories including teacher leadership, shared leadership, situational leadership, and transactional and transformational leadership. This evolution of leadership was influenced by the school reform movement that led to the need for schools to develop greater leadership capacity and not rely only on the principal. Although the principal is responsible for building the structures in the school to promote distributed leadership, all members of the school are all ultimately accountable for the school's success and raising student achievement. Several leading theorists including Spillane, Elmore, and Gronn helped shape the modern

concept of distributed leadership and have aided in its evangelism in education literature and practice.

The review will now present a conceptual framework, which links distributed leadership and student achievement in practice as well as the importance of mediators in the framework that enable it to be implemented with fidelity. Distributed Leadership entails building relationships and trust with teachers and staff to be effective. Likewise, learning organizations, PLCs, and communities of practice are founded on the principles of shared beliefs, collaboration, and trust.

Conceptual Framework

Figure 1 shows how learning organizations, communities of practice, and professional learning communities serve as a bridge that connects distributed leadership and student achievement. While all three concepts have similarities that are important, like building a shared vision and goals, collaboration, and shared leadership, they have distinct differences which add to the rich tapestry of capacity building and organizational growth and achievement (DuFour et al., 2008; Hord & Sommers, 2008; Senge, 2006; Wenger et al., 2002). Learning organizations focus on professional development of its members and seeks to continually transform the organization into a better version (Murphy, 2015a; Senge, 2006). Research shows that distributed leadership is a strong predictor of organizational learning (Türker, 2016). Professional learning communities foster collaborative learning among colleagues within a particular subject or field to discuss student learning (DuFour et al., 2008; Hord & Sommers, 2008). Communities of practice bring together heterogeneous groups who engage in a process of collaborative learning on a topic (Wenger et al., 2002). The models of professional learning

communities and communities of practice described above have some common aspects, but professional learning community models all draw from learning organization theory (Senge, 1990), communities of practice models draw from situated cognition, social learning theory, or knowledge management theory (Blankenship & Ruona, 2007).

Learning organizations. An organization is more likely to adapt to change through the learning efforts of individuals and the organization as a whole (Murphy, 2015a; Senge, 2006). Learning organization theory began with Schon's (1972) analysis of learning systems. In order for organizations to be able to meet new challenges and crises, organizations must be able to learn and adapt (Schon, 1972).

An organization needs to evolve and keep on transforming itself, not only to make it competitive, but should work towards a system that is founded on learning itself (Argyris & Schon, 1974). Learning organizations must be in a constant state of adaptation and transformation to stay relevant. This learning occurs holistically with the individual, group, organization, structure, and system levels working synergistically (Senge, 2006). Garvin (1993) defined learning organizations as organizations that are skilled at creating, acquiring, and transferring knowledge, and modifying its behavior to reflect new knowledge and insights (p.80). Garvin's (1993) acknowledgement of the relationship between knowledge creates, action, and learning correlates with Argyris and Schon's (1974) theory of action that learning requires action or doing. These principles match the action research principles associated with professional learning communities (DuFour et al., 2008; Stringer, 2013). According to Senge, a learning organization has five main characteristics: systems thinking, personal mastery, mental models, shared vision, and team learning (Senge, 2006).

System thinking. System thinking requires an organization to evaluate itself in its totality, not in parts. System thinking requires the ability for organizations to see the "big picture." Leaders need to recognize patterns and relationships between the parts of the organization and not rely on linear progression (Senge, 2006). Systems thinking allows the leader to become aware of the organization as a whole as well as the individual components. This allows leaders to conceptualize the effects of their actions on other parts of the organization. It further fosters collaboration and synergy among the various departments of an institution (Hodgkinson, 2000; Tsang, 1997). System thinking integrates the other four disciplines of Senge to form a whole system.

Personal mastery. Personal mastery refers to the process of self-evaluation, clarifying personal vision, and exercising objectivity in order to reach a special level of proficiency (Senge, 2006, p. 7). This requires individuals to assess the difference in their current and desired proficiency (Senge, 2006). Similar to the learning organization itself, personal mastery requires promoting continuous self-development and adapting to an ever-changing environment (Brown & Starkey, 2000). Personal mastery is developed through professional development and trial and error. Therefore, personal mastery requires honing skills and competencies to reach a high level of proficiency.

Mental models. Mental models are the "ingrained assumptions" of how the world works, which inform action (Senge, 2006, p. 8). This idea coincides with Argyris and Schon's (1974) theory of action, which involves mental models in the individual's head that informs behavior. Mental models highlight the connection between thought and action and inform practice in both individuals and organizations. Learning organizations require mental models to be in a state of continuous inquiry so they can be evaluated and

modified if necessary. Learning organizations embody shared mental models (Senge, 2006, p. 8; Yang, Watkins, & Marsick, 2004). Team learning is a strong mechanism to develop shared mental models (Orlov, 2003; Senge, 2006, p. 8). Filion and Hedwig (1999) argue against the goal of shared mental models because it can lead to groupthink and discourage deviation from the group norm (Janis, 1971). Shared mental models may encourage conformity at the expense of adaptation. Mental models may require organizational "unlearning" in order to acquire new ideas and allow the organization to adapt to new challenges.

Shared vision. Shared vision can be defined as a common perspective that individuals in the organization share and serves to focus efforts to achieve the organization's mission (Murphy, 2015a; Orlov, 2003; Senge, 2006). Principals are responsible for cultivating a shared vision in the school by aiding in the alignment of mental maps (Senge, 2006). The leader facilitates collaboration to shape and mold the organization's vision, rather than using top-down authority to set the agenda (Bolden, Petrov, & Gosling, 2009; Harper, 2015). This requires all stakeholders in the organization to determine and carry out the organization's mission and vision. This leads to a decentralized structure that allows for more adaptation and flexibility in the organization's structure (Quaglia Institute for School Voice and Aspirations, 2016; Robertson, 2015). Shared responsibility for the creation and implementation of the vision motivates organizational learning (Senge, 2006). Developing an authentic shared vision helps to promote organizational "buy-in." Shared vision is a thread that is interwoven through all aspects of this conceptual framework and plays a prominent role in learning organization, communities of practice, and professional learning communities.

Team learning. Teams are the desired learning unit in learning organizations (Hoerr, 2005; Orlov, 2003; Senge, 2006). Organizations function most effectively when they promote collaborative learning to accomplish its objectives. People learn from each other by sharing ideas, giving feedback, and promoting inquiry. This type of collaboration needs to be nurtured in organizations to develop a positive school culture (Yang et al., 2004). Senge (2006) champions conversation as a way to build team learning capacity. The organization has the ability to learn at a greater pace than individuals, which makes team learning ideal to improve positive outcomes (Brown & Starkey, 2000; Hodgkinson, 2000; Yang et al., 2004). Team learning requires open discourse and conversation among team members to solve problems and create positive outcomes.

Senge's five disciplines integrate multiple dimensions of learning in the organization by promoting positive outcomes. System thinking is the thread that connects all five disciplines. Organizations need to promote professional development to expand the mental models of its members and promote personal mastery. Team learning allows for the organization to learn and adapt at a quicker pace. When teams work together to embody the organization's shared mission, the organization is able to transform itself into a learning organization.

Communities of practice. Developing a working definition of communities of practice is important to distinguish it from the other components that comprise this research conceptual framework. Communities of practice can be defined as a flexible group of professionals, informally interdependent by common interests, who interact through interdependent tasks guided by a common purpose, thereby embodying common

knowledge (Jubert, 1999, p. 166). The connection of communities of practice with the production of collective knowledge has been to enhance professional communication (Abbott, 2014; Bazerman, Paradis, & Paradis, 1991).

Hildreth and Kimble (2000, p. 3) define communities of practice as groups of professionals informally bound to one another through the exposure to a common class of problems, common pursuit of solutions, and thereby themselves embodying a store of knowledge." A related definition comes from Wenger, McDermott & Snyder (2002, p. 7) who define Communities of Practice as groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis. While the use of the term has become quite widespread, the term actually stems from theories based on the idea of learning as social participation (Wenger, 1998).

These definitions give us a starting point to look at the relationship between communities of practice and knowledge management and Social Learning Theory. The concept of knowledge management is an interdisciplinary framework that deals with many aspects of knowledge within an organization. This includes knowledge creation, coding, sharing, and professional development to promote organizational learning and innovation (Davenport & Hall, 2002; Sumner, 1999). Knowledge management has experienced two major iterations in its brief history. The first generation aimed to improve knowledge sharing within organizations (McElroy, 2003). The second generation of knowledge management strategies focused more on organizational processes and in the creation of new knowledge. Successful organizations need to shift from management based on compliance to management based on self-control and self-

organization (Hovland, 2003). This gives the rationale for the movement towards developing communities of practice.

Social Learning Theory is a theory of learning and behavior that promotes the idea that behaviors can be acquired by observing and imitating others. Social Learning Theory can serve as both a behaviorist and cognitive model of human behavior (Bandura, 1993). Bandura's work is consistent with Vygotsky's (1978) social interaction theory. Both connect prominently with communities of practice and student learning. Wenger et al.'s (2002) work connects social learning theory and communities of practice. Wenger connects the theories by dismantling the idea that learning is an individual process. Rather learning is a social process that benefits all members of the group (Bandura & Walters, 1977; Vygotsky, 1978; Wenger et al., 2002).

Wenger et al. (2002) states that communities of practice are organized around three dimensions: mutual engagement, joint enterprise, and shared repertoire. The first dimension of mutual engagement states that communities of practice can be formed from members of different parts of the organization or profession. This process is not limited by geographical boundaries. Joint enterprise is defined by the group's shared goals, mission, and objectives. Shared repertoire refers to the routines, tools, and procedures that the group uses to accomplish its joint enterprise.

The concept of communities of practice is an important one when attempting to understand the complex relationships found between individuals. It distinguishes itself from the other components of this conceptual framework by emphasizing knowledge management and social learning theory. Situated in this research study, communities of

practice provide a roadmap to connect student achievement and leadership through using a diverse group of individuals focused on achieving the same goal.

Professional learning communities. Professional learning communities (PLCs) offer a way for schools to implement distributed leadership to promote student achievement for all students. There is an abundance of literature on PLCs supporting its implementation in schools (DuFour et al., 2008; Hattie, 2009; Hord & Sommers, 2008). In the era of school reform, many state and federal agencies have mandated the use of PLCs, which may lead to a more top-down approach to its usage. For example, New Jersey, California, Florida, and North Carolina all make mention to PLCs in their teacher evaluation. The effectiveness of PLCs depends heavily on the principal's willingness to share authority and motivate teachers to take on new responsibilities (Hord, 2004). PLCs are most effective when its components of shared leadership, shared values and vision, collective learning and application of learning, supportive condition, and shared practices are ingrained in the school culture and embodied by the staff and principal (Hord, 1997; Senge, 2006). PLCs are an important component to help teachers strive to increase student achievement on a continuous basis.

Dufour et al. (2008) defined PLCs as the collaboration of teachers, administrators, parents, and students, working together to seek out best practices, test them in the classroom, continuously improve processes, and focus on results. *A Nation at Risk* identified teacher professionalization as an issue affecting student achievement (DuFour et al., 2008; National Commission on Excellence, 1983). Although many researchers have discussed the need to implement PLCs to improve student achievement, this review will narrow the focus to DuFour and Hord models of PLCs.

The school reform movement helped usher in an era of accountability that promoted teacher collaboration and efficacy (Ravitch, 2010). Principals and teachers must work together in order to solve large system problems and develop systems of continuous improvement and action research (DuFour et al., 2008; Senge, 2006). Hord (1997) coined this practice as professional learning communities and made it a centerpiece of educational focus on school improvement. Her strategy focused on replacing the isolation of teachers with a collaborative approach that builds principal and teacher capacity and concentrated on student learning rather than teaching. Student achievement showed significant gains in schools that promote PLCs to focus on shared leadership, planning, and implementation of student learning (Reeves, 2012).

DuFour Model. DuFour's model argues that PLCs should focus on student learning rather than teaching practices. Learning communities must contain a shared vision, mission, and values; a collaborative culture with a focus on learning; collective inquiry, action-oriented; committed to continuous improvement, and results-driven (DuFour et al., 2008). The first main idea of DuFour's research is to transition the focus of school discussion from teaching to learning. A school's primary responsibility is to help students and ensure learning. This allows the focus of conversation to address student difficulties in the learning process (DuFour et al., 2008).

Culture Collaboration is another main idea in the research. Principals and staff need to work cooperatively to build capacity in schools. A third main focus is that PLCs are results-driven. The success of PLCs can be measured by student learning. Teachers in PLCs need data about their students' performance to determine if they are meeting learning targets.

Role of the principal in professional learning communities. PLCs can be implemented by educational leaders to solve a problem by transforming a crisis into an opportunity for change (DuFour et al., 2008; Fullan, 2004). Collins (2001) determined that the most effective leaders worked to build the capacity of their staff in order to develop leadership and continuous improvement. This, he concluded, ensured the organization would be successful after the departure of the leader. Principals should focus on developing systems, teams, and culture that ensure ongoing success of organizations (DuFour et al., 2008, p. 324). The development of teacher-leadership is the distinguishing factor of principal effectiveness (Fullan, 2011).

Hord Model. Hord uses five dimensions to describe PLCs: Supportive and shared leadership, collective creativity; shared values and vision; shared personal practices; and supportive conditions (Hord, 2004). Supportive and shared leadership promotes the idea that principals and school leaders must create supportive conditions for sustaining PLCs (Hord & Sommers, 2008). Teachers should have input into decision-making, management, and professional development. Leaders should give teachers great respect to work together as peers and colleagues (Leithwood et al., 2009).

Collective creativity refers to the idea that PLCs are a process of collective learning and development of the staff. It serves as a vehicle to turn the collective knowledge gleaned into practice in the classroom. In PLCs, principals and teachers learn together and create a community (Sergiovanni, 1994). PLCs are ongoing and promote collective learning in the school staff (Hord & Sommers, 2008). Teachers with varying performance levels can influence each other in a positive way to increase student achievement in the aggregate (Sun, Loeb, & Grissom, 2017). Collective creativity helps

teachers develop content knowledge and practices to improve teacher performance and student achievement. Shared values and vision are used by the faculty to ground decision-making in teaching and learning in the school. The sharing of personal classroom practice is vital to create a communal atmosphere and allow teachers to learn from each other's past successes and failures (Hord, 2004). Principals must ensure that structural supports are in place to sustain the PLC by providing time and space for teachers to meet and collaborate with each other. Schools need to create norms and standards for PLCs to become a part of the school culture and allow teachers to work together to focus on student learning and achievement (Hord & Sommers, 2008).

Mediators of Leadership and Student Achievement

While the conceptual framework provides a road map for distributed leadership influence on student achievement, there are several factors that need to be incorporated into the conceptual framework for it to be implemented with fidelity. Some of the factors needed for implementation are common vocabulary, commitment to practice, professional development, and capacity building. Empirical investigation found that principal effects are achieved through fostering group mission, vision, and goals, modeling behavior, and staff professional development (Leithwood & Patten, 2010). This section will address key factors involved in implementing each component of the conceptual framework.

While the literature describes distributed leadership as granting decision-making authority to various roles and committees within the school, and moving away from a singular leader, what that looks like in practice can vary from school to school and issue to issue (Hallinger & Heck, 1996). Robertson (2015) views the distributed leadership as a

"flat" model of leadership. This leadership model can be viewed as a holacracy in which leadership is decentralized and distributed throughout the organization of self-organizing teams rather than a traditional hierarchy (Robertson, 2015). Other views of distributed leadership could be the principal using various committees to inform and advise about important decisions (Rooney, 2004). Still others view the model as having two or more principals who work in concert to make decisions for the organizations (Holloway & Sgambelluri, 2019). These various definitions, while similar in theme, can lead to confusion and inconsistency during practice.

Important factors to implement learning organizations. Learning organizations need time and consistency to transform a school and build capacity in the faculty and staff (Yadav & Agarwal, 2016). Changing the culture of a school is a long process that may entail resistance to change (Kotter, 2007; Fullan, 2004). Leaders may have other issues that take priority over the process of building learning organizations. Ultimately, personal mastery needs to be an individual choice, and leaders cannot force the process on an unwilling participant (Yadav & Agarval, 2016). Leaders may also face challenges from contractual or union issues with implementing this process. The extra time devoted to building and maintaining this process may be blocked by competing interests of compensation and time (Jacoby, 2010). In addition, the size of the school may become a barrier to organizing and managing shared knowledge. Schools with over 150 staff members see internal knowledge sharing drop dramatically because of the higher complexity of the organizational structure, lower management trust, weaker relationship building, and less effective communication (Yadav & Agarval, 2016). The issues of time,

commitment, and school size are important factors to consider in transforming schools into learning organizations.

Important factors to implement communities of practice. Communities of practices are an effective way to use collective knowledge to investigate and solve school issues. In order to implement communities of practice, leaders need to address key factors such as school culture, organization, and technological issues (Clarke & Cooper, 2000). School culture has an effect on the relationships among staff members (Harris et al., 2007; Wenger, 1996). Schools need to ensure that all members have an active say and participate in the school community. Organizational issues can be impacted by the leader's ability to engage and motivate the staff (Lang, 2001). There is cost associated with the organizations' use of time, personnel, and resources (Boudett & City, 2014). The objective of communities of practice is to develop and expand organizational performance so leaders need to connect their value to the mission of the school. A technological challenge of implementing communities of practice is managing the exchange of ideas effectively (Botha, 2018). Knowledge management is at the heart of communities of practice and there must be vessels and systems in place to disseminate this information that is to key stakeholders and the organization as a whole (Venters & Wood, 2007). All of these areas need to be attended to consistently for communities of practice to have a lasting and meaningful impact on improving the school.

Important factors to implement professional learning organizations. Professional learning communities, when implemented effectively, are one of the most powerful professional development and change strategies available to influence student learning (Huffman & Hipp, 2003). Although there are clear benefits to the

implementation of PLCs, there are also many obstacle and challenges to implementing them effectively such as insufficient data on student learning, lack of infrastructure, lack of teacher buy-in, teacher ownership, and school culture (Levine, 2019; Lortie, 2002). Schools lag behind business in the organization, process, and dissemination of data (Boudett & City, 2013). Using data to track student learning is at the heart of the PLC process (Dufour, 2008; Hord, 2004). Schools need continuous access to student assessments in a timely fashion to implement formative decisions on student learning. Time is another key issue blocking PLCs from being implemented with fidelity in schools. Many schools lack common planning time for teachers. This could be because of school schedules or teacher contracts. Teachers need consistent and ample time to meet and discuss student learning. Teacher buy-in and ownership are essential for PLCs to be utilized to drive professional development. This is normally due to teachers feeling the burden of top-down management from school leaders (Hord, 2004). Teacher autonomy, long the hallmark of teaching, must be broken down and replaced with a culture of cooperation and collaboration (Elmore, 2000). Addressing these challenges are burdens on schools and principal and impact the effect PLCs can have on student learning.

Student Achievement

Defining student achievement is a difficult task because it can mean many different things to different people. This difference in opinion leads to the fundamental challenge of improving student achievement. For some people student achievement means test scores. To others developing citizenship, or emotional intelligence are more important skills for students to achieve. Although there is no general agreement on defining student achievement, it is commonly measured through testing and grading skills

and knowledge on individual subject matter (Ravitch, 2013; Ward, Stoker, & Murray-Ward, 1996).

One must examine if student test scores are appropriate to measure distributed leadership's effectiveness. Other factors besides test scores can be viewed as more important than results from standardized tests. Educating the whole child involves not just reading, writing, and arithmetic. It involves enriching opportunities like clubs, athletics, and community service (Millman, 1997; Schneider, 2017). Advancements like career placement, military service, and post-secondary education should also be considered when determining effective outcome measures for students. Principals who focus on relationship building may develop students who are active citizens in their community (Woods et al., 2016). Student achievement considered as test scores is easier to measure, but denies the complexity of the education experience and may come at the expense of physical, social, or emotional growth (Gratz, 2001).

Beginning in the 17th century, grades were used by higher education in the United States to measure student achievement (Smallwood, 1969). This practice was quickly adapted across American schools at every level. Grades represent a standard of achievement and serve as a definitive measure of student achievement (Stiggins, Griswold, & Frisbie, 1986). In addition to grades, states use many other factors such as test scores, college and career readiness, graduation rates, and absenteeism to determine student achievement ("New Jersey Public Schools Fact Sheet," n.d.). Raising standardized test scores, especially on the The Programme for International Student Assessment (PISA) has been the goal of the standards movement (Gurl et al., 2016).

Standards movement. The modern movement to standardize and centralize education may have begun in the fall of 1957 with the Russian launch of the Sputnik satellite. The launch of the satellite sparked a panic in the United States that the education system has fallen behind and sparked federal investment into the areas of science and world language (Cuban, 2004). The federal government took a more formal role in the education process when Lyndon B. Johnson signed the Elementary and Secondary Education Act (ESEA). The goal of the act was to establish strong standards and to close the achievement gap and promote equity (Perkins, 1965). This act gave birth to what would become the standards movement. The standards movement continued in the United States with the publishing of *A Nation at Risk* and continued with *National Education Goals*, *Goals 2000*, *No Child Left Behind legislation,* and *Race to the Top* (Vinovskis, 2009). Through the years, the standards movement has gained power and supporters (Fuhrman, 2004). What began as a standards movement translated into an accountability and testing movement and served to consolidate more power in the hands of the federal government at the expense of the state and local governments. Proponents of the standards movement will normally cite higher student achievement and economic growth as the need for high stakes accountability of schools and teachers (Cuban, 2004; Tienken, 2016). Although there is no evidence that the standards movement has improved student achievement, it continues to be the dominant force driving education policy (Ravitch, 2013).

Leadership Role on Student Achievement

With the increasing demands and mandates from federal and state governments, many principals today have found the traditional leadership structure consisting of a

singular leader on top is no longer effective (Sun & Xia, 2018). This has led to increasing research on how distributed, collective, and transformational leadership methods can be effective measures to improve student outcomes (Sun & Xia, 2018; Keiser, Kincaid, & Servais, 2011). Through working collaboratively with teachers and staff, distributed leadership has the potential to link leadership practices more closely to teaching and learning (Tashi, 2015). Research shows that principals who take a distributed leadership approach facilitate a school culture that values collaboration and sharing. This culture has a direct association with a teacher's self-efficacy and satisfaction (Sun & Xia, 2018). Student outcomes are more likely to improve when teacher self-efficacy is high and leadership sources are distributed throughout the school (Bandura, 1993; Sun & Xia, 2018; Muijs, 2011). Distributed leadership promotes a "flatter" organizational structure of leadership and incorporates the notion that leading and managing is more important than the position associated with leading and managing (Gurr & Drysdale, 2013).

Marzano et al. (2005) conducted a meta-analysis study, which showed a considerably higher impact for leaders on student achievement. This is supported by Karadağ et al. (2015), that found distributed and transformational leadership had a comprehensive effect on student achievement. If a leader is interested in improving student achievement, he or she may benefit from utilizing a distributed perspective to collaboratively develop organizational tools and routines (Castro, 2009). Distributed leadership is more than the distribution of different leadership roles to teachers in schools; it draws a frame of how leadership practices are implemented (Karadağ et al., 2015).

In order for leaders to have a direct impact on student achievement they must include teachers and staff members in the decision-making process. School leaders are generally held responsible for the achievement of students (Robinson, Lloyd, & Rowe, 2008; Ross & Gray, 2006). A teacher's knowledge of students in his or her classes has a significant effect on student achievement. Haittee (2009) rated teacher efficacy of student achievement as the number one factor on raising student achievement. Therefore, school leaders must bring teachers into the equation in determining policies and curriculum.

Recent attention has been paid to the link between leadership and student outcomes to influence policymakers in determining ways to close the achievement gap (Robinson et al., 2008). There is evidence linking distributed leadership to organizational growth and achievement, but it remains the case that empirical studies of distributed leadership are relatively limited (Muijs, 2011). Qualitative research lends support to the impact of leadership on school effectiveness and improvement (Murphy, 2005; Robinson et al., 2008). This is supported by literature on sustainability that cites strong leadership on continued organizational learning and improvement (Collins, 2001; Hargreaves & Fullan, 2013).

School leaders may have a significant impact on student learning (Branch, Hanushek& Rivkin, 2012; Brewer, 1993; Grisom, Kalogrides, & Loeb, 2015; Grissom, Loeb, & Master, 2013; Hallinger & Heck, 1998; Waters, Marzano, & McNulty, 2003). Leaders increase student learning by improving the condition of the rational, emotions, organizational, and family pathways (Leithwood et al., 2010). This literature lends support to the idea that teachers and administrators make some schools significantly more effective than others (Leithwood et al., 2010; Murphy, 2015a). The 1966 US Report on

Equality of Educational Opportunity countered long-held beliefs about the factors that most influence student achievement (Coleman, 1973). A school leader's effectiveness is based on how well students achieve (York-Barr & Duke, 2004). As a result, "instructional leadership" is seen as the linchpin between principal practices and student achievement (Menon, 2013; Robinson et al., 2008). This led to the concept of value methodology for evaluating a leader's effectiveness (Murphy, 2013). Effective leaders focus on building the capacity of their teachers through professional development, allocation of resources, and providing time for collaboration. These in turn provide more favorable conditions for student achievement (Hargreaves & Fullan, 2013; Harris & Lambert, 2004). In addition to building the capacity of their staff members, leaders in such schools must also build bridges to their community and form relationships with parents and families (Potter, Reynolds, & Chapman, 2002). Leithwood et al. (2010) determined that there exists a set of core leadership practices that are necessary for improved student achievement.

Summary

This literature review utilized a conceptual framework of communities of practice, learning organizations, and professional learning communities to link the research between student achievement and distributed leadership. Communities of practice, learning organizations, and professional learning communities have a symbiotic relationship which each other. Each promote developing leadership capacity in the organization to increase learning. Distributed leadership shows promise for improving student achievement through utilizing the collective knowledge of administrators, teachers, and staff. Although there are differences between qualitative and quantitative

research in regard to the effectiveness of leadership on student achievement, recent research has looked to break apart leadership into different leadership theories and analyzed their parts on student achievement. This research will quantify the effect of distributed leadership on student achievement.

Chapter 3

Methods

The purpose of this quantitative study is to examine the properties of the distributed leadership scores and to investigate whether the scores predict student test scores. The study may help principals determine if utilizing a distributed leadership approach can improve student achievement. This research study was designed to analyze survey results from principals in New Jersey to ascertain their readiness and perceptions of distributed leadership and link these results to student achievement data. The effective methods for this paper are drawn from Elmore's five dimensions: mission, vision and goals, leadership practices, school culture, decision-making, evaluation and professional development (Elmore, 2000). Gordon (2005) conducted a factor analysis that condensed these dimensions into four: mission, vision and goals; school culture; shared responsibility; and leadership practices. The dimension of shared responsibility was developed when Gordon merged evaluation and professional development with decision-making (Gordon, 2005). These four dimensions are used to determine a principal's readiness to implement distributed leadership. This study attempted to answer the following research questions:

1. What is the level of New Jersey public school principals' perceptions about their distributed leadership readiness?
2. What characteristics predict a New Jersey principal's readiness score?
3. What is the relationship between principals' distributed leadership readiness score and student test scores?

This study utilized a quantitative research design to answer the research questions.

Quantitative methods allow study results to be generalized and applied to other studies on the topic (Creswell & David Creswell, 2017). In order to address the research questions, principals working at public schools in New Jersey were asked to complete a survey with two parts: a pre-survey and the Distributed Leadership Readiness Scale survey. Student achievement for this research was looked at through the lens of the percentage of students meeting or exceeding expectations on the NJSLA from Grade 4 Math and English, Grade 8 Math and English, Algebra I, and English 10.

Connection to Theory

The topic of distributed leadership has been studied qualitatively. The research findings of Leithwood et al. (2009) suggest that leadership practice should be explored further and more quantitative information needs to be collected to build a foundation of research on the topic. Leithwood and Mascall (2008), along with many other researchers, have stated that expanding the scope of leadership outside of the principal benefits the entire school.

The logic model shows the need for principals to empower teachers to take on leadership responsibilities in the school. In order to meet this goal, principals must seek professional development opportunities to develop their distributed leadership readiness. Figure 2 shows how implementing professional learning communities and communities of practice can include multiple stakeholders in planning and implementing programs in the school. Short- and long-term goals show improving the school climate and culture by training and retaining quality teachers. By keeping the best teachers, schools can leverage their talents in and out of the classroom to enhance the student experience. This process also helps principals build and establish a culture of trust in the school. When there is a

climate and culture in which distributed leadership is encouraged, principals will be willing to take risks in sharing responsibilities and decision-making with others (Maltempi et al, 2019). Figure 2 shows the impact of achieving the short and long-term goals and how they impact student success in the areas of improved attendance, test scores, behavior, graduation rate, and college and career readiness.

			Outcomes		
Inputs	Strategies & activities	Outputs	Short-term	Long-term	Impact
Encourage principals to empower teachers to take a leadership role in the school Provide principals with professional development on distributed leadership	Develop professional learning communities and communities of practice Include all stakeholders in the decision-making process to facilitate learning organizations and build trust	Program content and structure is aligned with evidence of distributed leadership High quality professional learning designed for the principal and staff	Improved leadership capacity and trust in the following competencies: • Sets directions, vision, and goals • Develops professional learning of staff • Manages school environment	Improved schools in the following areas: • Instructional quality • School culture/climate/ environment • Retention of high-quality staff • Enriching the student experience	Increased student success in the following areas: • Student attendance • Student behavior • Student achievement • Graduation • College and career success

Figure 2. Logic model.

Participants

The sample for this study was selected from principals of public school districts in New Jersey. The state of New Jersey has both public and private schools, however, this study used only public school districts. In addition, charter schools were not included in

the study in order to maintain consistency of the results. Elementary, middle, and high schools are included in the study.

Of the 2,533 public schools in New Jersey, 306 schools do not have grades lower than fourth. These schools were eliminated from the survey distribution because there is no standardized NJSLA below 4th grade. This means that 2,227 New Jersey school principals were emailed the survey. Although 201 principals responded to the survey with a response rate of 9%, only 103 principals responded to every question in the survey for use in analyses. Therefore, any analyses performed on this small sample will have weaker statistical power. In addition, because principals chose whether or not to respond to the survey, this may have led to non-response bias.

Data Sources, Measurements, and Tools

The design of the research study included the collection of distributed leadership survey information, which measured the level of distributed leadership in each school according to the principals. In order to maintain anonymity, principals were asked to provide personal and professional characteristics, school characteristics, and student achievement data.

Data collection. The survey was distributed through the New Jersey Supervisors and Principals Association (NJPSA) database. In October of 2019, NJPSA endorsed this research study and agreed to send out the survey to its membership. Data was collected using one instrument with two parts: a pre-survey and Distributed Leadership Readiness Scale (DLRS) survey. The pre-survey contained principal demographic questions as well as school characteristic questions. The demographic questions asked principals to identify gender; race/ethnicity; number of years of principal experience; and highest level of

education. The school characteristic questions include percent of chronic absenteeism; student enrollment size; number of school staff; percent of students with free or reduced lunch; school locality (city, suburb, rural, or town), and applicable English and Math NJSLA scores from the previous year.

Distributed Leadership Readiness Survey. The Distributed Leadership Readiness Scale (DLRS) was developed by the Connecticut State Department of Education to determine the readiness of schools to use distributed leadership (Gordon, 2005). The survey can be used to determine if a school's distributed leadership readiness has a relationship with student achievement. Each item will use a five-point scale from "Rarely/Never" (1) to "Continually" (4). Principals will be instructed to select "N/A" if they do not have sufficient information to respond to the statement. The items on the DLRS were reviewed by a team of educators in order to match the items to one of the original five distributed leadership dimensions (Gordon, 2005). As a result, it was concluded that the DLRS has face validity since the committee determined that the items measure the intended constructs.

The Distributed Leadership Readiness Scale (DLRS) is organized into four key dimensions of instructional leadership: Mission, Vision, and Goals; School Culture; Decision-Making; Evaluation and Professional Development; and Leadership Practices. Sample items from each of the dimensions are listed below:

Mission, vision, and goals.

1. Teachers and administrators understand and support a common mission for the school and can describe it clearly.

2. If students are asked to describe the school's mission, most would be able to describe the mission generally.

School culture.

1. Teachers and administrators have high expectations for students' academic performance.
2. The school is a learning community that continually improves its effectiveness, learning from both successes and failures.

Shared responsibility.

1. There is a high level of mutual respect and trust among the teachers and other professional staff in the school.
2. The school administrator(s) welcome professional staff members input on issues related to curriculum, instruction and improving student performance.

Leadership practices.

1. New teachers are provided opportunities to fill some school leadership roles.
2. Teachers are interested in participating in school leadership roles.

The construct validity and reliability of the DLRS were evaluated by Gordon (2005) with a study that examined the psychometric properties of the DLRS. Two samples were used for this study, a pilot sample and the proposed sample. Thirty-six schools, 26 elementary and 10 middle and high schools, were used containing a total of 1,257 educators in Connecticut. Gordon used factor analysis in order to determine the construct validity and reliability of the survey. When using the factor analysis on Elmore's five dimensions: mission, vision and goals, leadership practices, school culture, decision-making, evaluation and professional development, the factor analysis produced

four dimensions of mission, vision and goals; school culture; shared responsibility; and leadership practices. The dimension of shared responsibility was developed when Gordon merged evaluation and professional development with decision-making. "All the items loaded above .35, indicating reasonably strong construct validity (p.61). The four dimensions were found to be internally consistent (Cronbach's alpha .84 to .92), reliable and well defined by the items. Inter-item correlation for each item within each dimension ranged from .35 to .77" (Gordon, 2005, p. 61). As a result, it was determined that schools can use the DLRS to measure the extent to which distributed leadership is implemented as a way to expose deficiencies in order to make enhancements.

An internal consistency method was used to ensure reliability (Gordon, 2005). It is important to establish reliability to know that there is overall consistency of a measure. Gordon (2005) used the item-total correlation test to determine if any of the items had responses that varied from the responses to the rest of the items in that dimension. The results indicated that the DLRS is a reliable instrument that can be used in future studies (Gordon, 2005).

Data Analysis

SPSS software was used to generate the descriptive statistics as well as the multiple linear regression models. Multiple linear regression analysis helps us understand how much a dependent variable changes when we change the independent variable controlling for other factors. In this study, it tells us how much Student Achievement scores are expected to increase or decrease for every one point increase or decrease of a school characteristic controlling for other principal and school characteristics (Creswell & Creswell, 2017; Kutner, et al., 2004; Lyman & Longnecker, 2008; Montgomery,

2012). This means that the method removes any possible influence on the relationship that come from these other characteristics. Although it cannot control for all important factors, as some of them are unobservable to the researcher (e.g., school culture, contractual obligations, or teacher efficacy), the method is superior to simple bivariate analysis. An estimated relationship through a bivariate analysis is confounded with these influential factors, which tends to be misleading.

To answer the first research question, responses to all forty questions were used to calculate the mean and the standard deviation to show the distribution of the responses. In order to determine what predicts the distributed leadership readiness, I model a principal's readiness as a function of principal and school characteristics.

The model for a principal's readiness takes the following form:

$$y_{is} = \beta_0 + P_i\beta_1 + S_{is}\beta_2 + \varepsilon_{is}$$

The readiness of a principal i at school s is a function of principal characteristics P_i (race/ethnicity; gender; number of years of principal experience; and highest degree obtained), school characteristics S_{is} (percent of chronic absenteeism; school enrollment size; number of school staff; percent of students with free or reduced lunch; school locality; and the percent of students meeting or exceeding expectations on the applicable English and Math NJSLA from the previous year), and a random error term ε_{is}.

The last research question was answered using the percent of students meeting or exceeding expectations on the NJSLA from Grade 4 Math and English, Grade 8 Math and English, Algebra I, and English 10 to represent student achievement. The grade 4 and 8 NJSLA tests were used because they are universally reported on the New Jersey School Report Card. The Algebra I and English 10 NJSLA exams were the state test graduation

requirement in New Jersey at the time of the surveys development, which is why they are being used to represent student achievement.

Descriptive statistics were generated for each of the variables that are believed to have a relationship with students' NJSLA scores in order to gain an understanding of the range of values, mean, and standard deviation before continuing with analyses.

After learning about the variables from the descriptive statistics, a series of multiple linear regression models were used to estimate the relationship between the distributed leadership readiness and student outcomes. The models included the school characteristics that may also contribute to student achievement in addition to the Distributed Leadership Readiness Scale survey score. The models did not include the principal characteristics because the DLRS score reflects part of the principal characteristics. Models were also estimated to detect a possible non-linear relationship between DLRS and student achievement as well as a potential interaction effect between DLRS and the number of staff members.

A multiple linear regression is used to predict the value of a variable based on the value of two or more other variables (Kutner, Nachsheim, & Neter, 2004). The variable we want to predict is student achievement. The model for student achievement takes the following form:

$$y_{is} = \beta_0 + P_i\beta_1 + S_{is}\beta_2 + DLRS\beta_3 + \varepsilon_{is}$$

The student achievement at school s with principal i is a function of principal characteristics P_i (race/ethnicity; gender; number of years of principal experience; and highest degree obtained), school characteristics S_{is} (percent of chronic absenteeism; school enrollment size; number of school staff; percent of students with free or reduced

lunch; school locality; and the percent of students meeting or exceeding expectations on the applicable English and Math NJSLA from the previous year), the Distributed Leadership Readiness Scale survey score, and a random error term ε_{is}.

The estimated coefficient, β_3, is a point of interest and is interpreted as the association between distributed leadership readiness and student achievement, holding other factors constant.

Limitations

Responding to the survey is voluntary so the respondents' demographics were not representative of the overall New Jersey principal population. Moreover, this survey depends on a self-report of the perceptions of the principals' implementation of distributed leadership. Because of the anonymous nature of this study, it was not possible to triangulate the principals' espoused perceptions of distributed leadership readiness with his/her teachers' perceptions.

In addition to limitations surrounding the self-selected nature of responding to the survey, there may be additional influencing factors that could not be included in the model because of the difficulty in collecting measures on them. For example, if a superintendent advocates for distributed leadership with targeted professional development, principals reporting to this superintendent are more likely to implement distributed leadership. If this is associated with student achievement and distributed leadership readiness scores, the model will be biased because the estimate on distributed leadership readiness will also include the effect of the superintendent.

Ethical Considerations

Ethical considerations are an important part of any research proposal. In order to maintain anonymity, principals were asked to provide the demographics, school characteristics, and student achievement data. However, it is possible that the variables collected from each principal could be unique to certain schools, and therefore, potentially identifiable. In order to prevent any exposure, all information is kept confidential and only the researcher and his chair have access to the data.

Chapter 4

Results of Study

The purpose of this quantitative study is to determine the relationship, if any, between distributed leadership and student achievement. The study examines if the distributed leadership readiness of the principal is associated with student achievement. This study uses quantitative data to answer the following three research questions:

1. What is the level of New Jersey public school principals' perceptions about their distributed leadership readiness?
2. What are the main predictors of a New Jersey principal's readiness score?
3. What is relationship between principals' distributed leadership readiness score and student test scores?

Results

The analysis starts with descriptive statistics. As described in Chapter 3, the target population is all principals of public-school districts in New Jersey. A total of 2,227 principals were e-mailed the survey through the New Jersey Supervisors and Principals Association (NJPSA) between October, 2019, and January, 2020. At the close of the survey, 201 principals responded to the survey with a response rate of 9%, and only 103 principals responded to every question in the survey for use in analyses. Table 1 presents descriptive statistics of these principals and their schools. Some of the descriptive statistics can be compared to the entire population of New Jersey public school principals as well as some national statistics. The National Center for Education Statistics: National Teacher and Principal Survey (NTPS) has data on the percent of principals by race/ethnicity by state for the 2017-2018 school year.

Table 1

Descriptive Statistics

	N	Mean	SD	Minimum	Maximum
Principal characteristics					
Gender					
Female	103	0.42		0	1
Male	103	0.58		0	1
Race/ethnicity					
Black/African American	103	0.06		0	1
Hispanic	103	0.05		0	1
White	103	0.87		0	1
AI/AN	103	0.01		0	1
Two or more races	103	0.01		0	1
Educational attainment					
Master's degree	103	0.72		0	1
Doctorate	103	0.28		0	1
Years of principal experience					
< 2 years	103	0.08		0	1
2-4 years	103	0.14		0	1
5-7 years	103	0.22		0	1
> 7 years	103	0.56		0	1
School characteristics					
Percent of chronic absenteeism	103	7.71	5.55	1.00	26.20
Student enrollment	103	530.83	284.28	91.00	1574.00
Number of school staff	103	68.82	33.62	15.00	217.00
Percent free/reduced lunch	103	34.30	30.85	0.00	100.00
School locality					
Suburb	103	0.58		0	1
City	103	0.17		0	1
Town	103	0.13		0	1
Rural	103	0.12		0	1

Note: Chronic absenteeism is the percentage of a school's students who are not present for 10 percent or more of school days. Number of school staff includes teachers, administrators, and instructional aides.

Of the principals that completely responded to the entire survey, 42% identified as female and 58% identified as male. The majority of principals identified as White, 87%;

6% as Black/African American; 5% as Hispanic; 1% as American Indian/Alaska Native; and 1% as two or more race. No principals identified as Asian or Native Hawaiian/Pacific Islander. While the majority of principals in New Jersey identify as White, it is 78% across the entire state, with 15% identifying as Black/African American, and 6% as Hispanic. The reporting standards were not met to publish the percentage of principals for all other races. Across the United States, 78% of principals identify as White, 11% as Black/African American, 9% as Hispanic and 3% as other races (National Center for Education Statistics, 2018). The race/ethnicity demographics of principals in this survey differ somewhat from that of the demographics of all principals in New Jersey. Principals identifying as Black/African American are underrepresented, while principals identifying as White are overrepresented. Consequently, the results cannot be generalized to all principals in New Jersey. Underrepresentation of Black/African American principals may bias the estimates if their responses are systematically different from those of other race/ethnicity and they affect student performance in a different way.

The highest degree obtained by these principals is a master's degree for 72% of the sample and a Doctorate for 28%. The last demographic question asked principals to report the number of years as the principal of the school. This sample of principals has 8% of respondents with less than 2 years as the principal, 14% with 2-4 years, 22% with 5-7 years, and 56% with more than 7 years.

Table 1 also includes the school characteristics for the principals that respondent to the survey. The average student enrollment is about 531 students and the average number of school staff is 69. The average chronic absenteeism rate for principals responding to this survey is 7.70%. Across the state of New Jersey, the average chronic

absenteeism rate is 10% for the 2015-2016 school year. The principals responding to this survey have a lower rate of chronic absenteeism than principals across the state of New Jersey in 2015-2016. It is important to note that chronic absenteeism was added as a measure on the school report card in the 2016-2017 school year. As a result, schools have been working to lower this rate so it is expected that the rate of the principals in this survey are lower than the statistic in 2015-2016.

The average free/reduced lunch rate for principals responding to this survey is about 34%. In comparison, across the state of New Jersey, the average percent of students approved for free/reduced lunch is 42% for the 2017-2018 school year (New Jersey Department of Education, n.d.). The principals responding to this survey have a lower free/reduced lunch rate and chronic absenteeism than principals across the state of New Jersey in 2017-2018. The percent of students approved for free/reduced lunch across the country is 55% for the 2017-2018 school year.

Reliability Analysis

The Distributed Leadership Readiness Scale survey comprised 40 questions, each addressing one of four dimensions; Mission, Vision, and Goals; School Culture; Shared Responsibilities; and Leadership Practices. The reliability of responses was evaluated using the internal consistency measure, Cronbach's alpha. Table 2 reports item means and alphas. Responses to each item were "Rarely/Never" (1), Sometimes (2), "Frequently" (3), or "Continually" (4).

Table 2

Survey Item Means and Cronbach's alphas

	Item mean	*alpha*
Overall	3.29	0.95
By Dimension		
(1) Mission, Vision, and Goals	3.13	0.86
DLRS Item 1	3.48	
DLRS Item 2	3.26	
DLRS Item 3	2.41	
DLRS Item 4	2.34	
DLRS Item 5	3.36	
DLRS Item 6	3.17	
DLRS Item 7	3.26	
DLRS Item 8	3.71	
(2) School Culture	3.35	0.87
DLRS Item 9	3.64	
DLRS Item 10	3.51	
DLRS Item 11	3.24	
DLRS Item 12	3.38	
DLRS Item 17	3.35	
DLRS Item 18	2.87	
DLRS Item 19	3.38	
DLRS Item 20	3.56	
DLRS Item 21	3.16	
DLRS Item 22	3.40	
(3) Shared Responsibilities	3.50	0.89
DLRS Item 13	3.50	
DLRS Item 14	3.54	
DLRS Item 15	3.66	
DLRS Item 16	3.59	
DLRS Item 23	3.62	
DLRS Item 24	3.35	
DLRS Item 26	3.47	
DLRS Item 27	3.56	
DLRS Item 28	2.94	
DLRS Item 29	3.36	
DLRS Item 30	3.47	
DLRS Item 32	3.65	

Table 2 (continued)

	Item mean	*alpha*
DLRS Item 33	3.74	
(4) Leadership Practices	3.06	0.86
DLRS Item 25	3.48	
DLRS Item 31	3.06	
DLRS Item 34	3.35	
DLRS Item 35	3.26	
DLRS Item 36	2.99	
DLRS Item 37	3.08	
DLRS Item 38	2.54	
DLRS Item 39	2.94	
DLRS Item 40	2.83	

The Mission, Vision, and Goals construct was measured with 8 items. For these 8 items, Cronbach's alpha was 0.86. The closer the alpha is to 1, the greater the internal consistency. As a result, there is high internal consistency with the Mission, Vision, and Goals items. The School Culture dimension was measured with 10 items. For these 10 items, Cronbach's alpha was 0.87, which shows strong internal consistency. The Shared Responsibilities construct was measured with 13 items. For these 13 items, Cronbach's alpha was 0.89, which shows excellent internal consistency. Lastly, the Leadership Practices dimension was measured with 9 items. For these 9 items, Cronbach's alpha was 0.86, which shows very good internal consistency. These four tests demonstrate that the items within each dimension measures the same construct. Lastly, the overall DLRS construct was measured with all 40 items. For these 40 items, Cronbach's alpha was 0.95, which shows excellent internal consistency across all four dimensions in the overall DLRS.

Figure 3 shows the distribution of scores for the overall DLRS and the four dimensions.

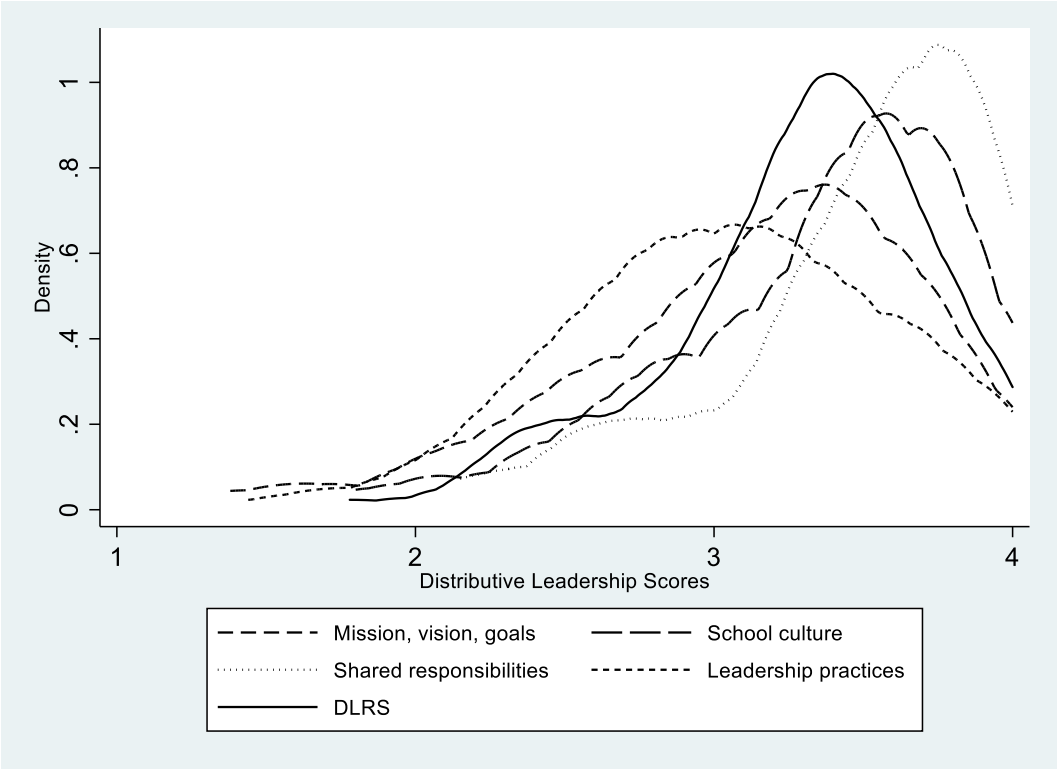

Figure 3. Distribution of scores for DLRS.

This shows distributions that are all skewed left because principals have high perceptions of their implementation of distributed leadership across all four dimensions, and consequently, the overall DLRS. The distributions for Mission, Vision, and Goals and Leadership Practices are similar with peaks around a score of 3. The distributions for School Culture and Shared Responsibilities have peaks approaching a score of 4.

Next, correlations among these four dimension scores as well as the overall score were examined. Table 3 reports the results.

Table 3

Correlations among Four Dimension Scores and Overall Score

	DLRS	Mission, Vision, and Goals	School Culture	Shared Responsibilities	Leadership Practices
DLRS	1.00				
Mission, Vision, and Goals	0.83***	1.00			
School Culture	0.90***	0.67***	1.00		
Shared Responsibilities	0.93***	0.69***	0.81***	1.00	
Leadership Practices	0.84***	0.58***	0.67***	0.71***	1.00

Notes: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

It shows significant strong relationships between the overall DLRS and all four dimensions. There is also a significant strong relationship between School Culture and Shared Responsibilities. There are significant moderate relationships between all remaining dimensions.

Because all the domains are highly correlated, exploratory factor analysis was performed to examine whether the instrument measures each dimension distinctively or a single latent distributed leadership factor. The exploratory factor analysis revealed a single latent factor and suggests that one factor underlies all the Distributed Leadership Readiness Survey questions. The developer of the survey instrument also found a single underlying factor (Gordon, 2005). For this reason, as well as for ease of interpretability, the mean of the all survey items is used as a distributed leadership variable for analyses moving forward. That is, the mean of responses to all items for each principal.

Principals' Perceptions About Distributed Leadership Readiness

To understand the level of New Jersey public school principals' perceptions about their distributed leadership readiness (Research Question 1), I calculate the mean of survey items for each dimension as well as the mean of all survey items. Table 4 shows the overall mean was 3.29, which is between frequently (3) and continually (4).

Table 4

Distributed Leadership Dimension Scores

	N	Mean	Std. Deviation	Minimum	Maximum
DLRS (mean of all items)	103	3.29	0.45	1.78	4.00
Mission, Vision, and Goals	103	3.13	0.58	1.38	4.00
School Culture	103	3.35	0.51	1.80	4.00
Shared Responsibilities	103	3.50	0.45	2.15	4.00
Leadership Practices	103	3.06	0.55	1.44	4.00

Principals believed that they are practicing distributed leadership often. The average scores for each dimension showed that principal practice shared responsibilities most often, followed by school culture, then mission, vision, and goals, and lastly leadership practices. The low standard deviations show that most values are close to the mean for the DLRS survey score as well as each of the four dimensions. These findings are consistent with other dissertations that have used the DLRS instrument in Connecticut, Mississippi, and Missouri (Christy, 2008; Gordon, 2005; Zinke, 2013). For example, in Connecticut, Gordon (2005) found that the average mean score was between frequently and continually. Gordon's sample consisted of certified school-level staff members including administrators from 36 Connecticut schools that participated in a

distributed leadership demonstration. Approximately 1,391 certified education practitioners completed the survey.

Predictors of Distributed Leadership Readiness Dimension Scores

In order to determine what predicts the distributed leadership readiness (Research Question 2), I estimate a series of multiple regression models described in Chapter 3 for the overall score. Table 5 reports the estimated coefficients.

Table 5

Predictors of Distributed Leadership Dimension Scores

	Overall DLRS				
	Model 1	Model 2	Model 3	Model 4	Model 5
Principal characteristics					
Black/African American	-0.43**	-0.48***	-0.42**	-0.44**	-0.46***
	(0.18)	(0.18)	(0.18)	(0.18)	(0.17)
Hispanic	-0.11	-0.08	-0.05	-0.12	-0.06
	(0.20)	(0.20)	(0.20)	(0.20)	(0.19)
Other race/ethnicity	0.64**	0.56*	0.64**	0.60*	0.59*
	(0.30)	(0.30)	(0.31)	(0.31)	(0.3)
Female	0.04	0.05	0.04	0.03	0.02
	(0.08)	(0.08)	(0.09)	(0.09)	(0.08)
Doctorate	0.18*	0.18*	0.19**	0.17*	0.19**
	(0.10)	(0.09)	(0.10)	(0.10)	(0.09)
Years of principal experience					
Two to four years	0.14	0.15	0.12	0.15	0.20
	(0.18)	(0.18)	(0.19)	(0.19)	(0.18)
Five to seven years	0.44**	0.40**	0.43**	0.45**	0.50***
	(0.17)	(0.17)	(0.18)	(0.17)	(0.17)
Greater than 7 years	0.29*	0.24	0.29*	0.30*	0.31**
	(0.15)	(0.15)	(0.16)	(0.16)	(0.15)
School characteristics					
Percent of chronic absenteeism	0.01	0.01	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Student enrollment (in 100s)	0.01	-0.01	-0.03	0.01	-0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)

Table 5 (continued)

	Overall DLRS				
	Model 1	Model 2	Model 3	Model 4	Model 5
Number of staff (in 10s)	-0.03*	0.07		-0.03	-0.03*
	(0.02)	(0.04)		(0.02)	(0.02)
(Number of staff)^2 (in 10s)		-0.01**			
		(0.00)			
Number of staff quartile 2 (in 10s)			0.05		
			(0.12)		
Number of staff quartile 3 (in 10s)			0.02		
			(0.14)		
Number of staff quartile 4 (in 10s)			0.10		
			(0.17)		
Percent free/reduced lunch	-0.01***	-0.01***	-0.01***	-0.01**	
	(0.00)	(0.00)	(0.00)	(0.00)	
(Percent free/reduced lunch)^2				0.00	
				(0.00)	
Percent free/red. lunch quartile 2					-0.33***
					(0.11)
Percent free/red. lunch quartile 3					-0.29**
					(0.11)
Percent free/red lunch quartile 4					-0.79***
					(0.17)
School locality					
City	0.48***	0.39**	0.46**	0.42**	0.51***
	(0.17)	(0.17)	(0.18)	(0.20)	(0.18)
Town	0.05	0.04	0.07	0.05	0.14
	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)
Rural	0.11	0.15	0.06	0.10	0.15
	(0.14)	(0.13)	(0.14)	(0.14)	(0.13)
Constant	3.24***	2.94***	3.19***	3.25***	3.30***
	(0.18)	(0.21)	(0.18)	(0.18)	(0.18)
Adjusted R-squared	0.22	0.26	0.18	0.21	0.27
N	103	103	103	103	103

Notes: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Model 1 shows some significant coefficients. The White principals were excluded from the model so that each race/ethnicity is compared to the principals that identify as White in terms of means controlling for other variables in the model. Among principal

characteristics, Black/African American is found negatively associated with the overall distributed leadership scores. On average, Black/African American principals' score is lower than that of White principals by 0.43.

The Other race/ethnicity is also significant with a positive coefficient (0.64). Principals who identify as other races besides Black/African American and Hispanic have a DLRS score higher than White principals by 0.64. The number of years of principal experience is non-linearly associated with the score. The longer the experience is, the higher the score is.

Although less precisely estimated due to the small sample size, the degree is also positively associated with the score. On average, principals who have a doctorate have a DLRS score higher than principals with a Master's degree by 0.18.

Among school characteristics, the percent of students with free/reduced lunch is significant with a negative beta coefficient (-0.01). Principals serving a higher percentage of students receiving free/reduced lunch tend to have lower DLRS scores.

In addition, the variable "City" is significant in the regression with a positive beta coefficient (0.48). Principals of city schools have a DLRS score higher than principals of suburban schools. The number of staff (in 10s) is also significant at the 0.10 level with a negative beta coefficient (-0.03). Principals with more staff members have a lower DLRS score lower.

The overall DLRS Model 1 has an Adjusted R Square value of 0.22. This indicates that 22% of the variance in the Distributed Leadership Readiness Survey score is explained by the model.

Non-linearity. With a principal overseeing everything from instructional practice to transportation to facility maintenance, it may become increasingly difficult to install distributed leadership strategies for a very large staff. Models 2 and 3 were estimated in order to check if the relationship between the number of staff (in 10s) and the DLRS score is non-linear.

Model 2 includes a square of the number of staff (in 10s). The square of the number of staff (in 10s) is significant with a negative beta coefficient (-0.01). The relationship between the number of staff members and the DLRS score varies as you increase the number of staff members. As a result of this significant coefficient, this model shows evidence of a non-linear relationship.

Model 3 replaces the number of staff (in 10s) with a set of dummy variables. The four quartiles were calculated for the number of staff (in 10s). The first quartile was not coded so we can determine if the second, third, or fourth quartiles predict a different DLRS score than being in the first quartile. None of these dummy variables are significant in the model. Consequently, there is not strong evidence that there is nonlinearity between the number of staff (in 10s) and the perceived distributed leadership readiness.

In addition, schools with a large percentage of students receiving free/reduced lunch pose a challenge to leadership. Principals of schools with large free/reduced lunch populations may need to contend with competing priorities to limited community resources. Models 5 and 6 were estimated in order to check if the relationship between the percent free/reduced lunch and the DLRS score is non-linear.

Model 4 includes a square of the percent free/reduced lunch. The square of the percent free/reduced lunch is not significant in the regression. The percent free/reduced lunch is still significant in Model 4 As a result of the square term not being significant, it cannot be concluded that there is a non-linear relationship between the percent free/reduced lunch and the DLRS score.

Model 5 replaces the percent free/reduced lunch with a set of dummy variables. The four quartiles were calculated for the percent free/reduced lunch. The first quartile was not coded so we can determine if the second, third, or fourth quartiles predict a different DLRS score than being in the first quartile. All of these dummy variables are significant in the model. Quartiles 2 and 4 are significant at the 0.01 level and quartile 3 is significant at the 0.05 level. Although this model shows significance for the three dummy variables, the square term in the previous model was not significant.

Figure 4 shows the scatterplot of DLRS by percent free/reduced lunch with a fitted curve.

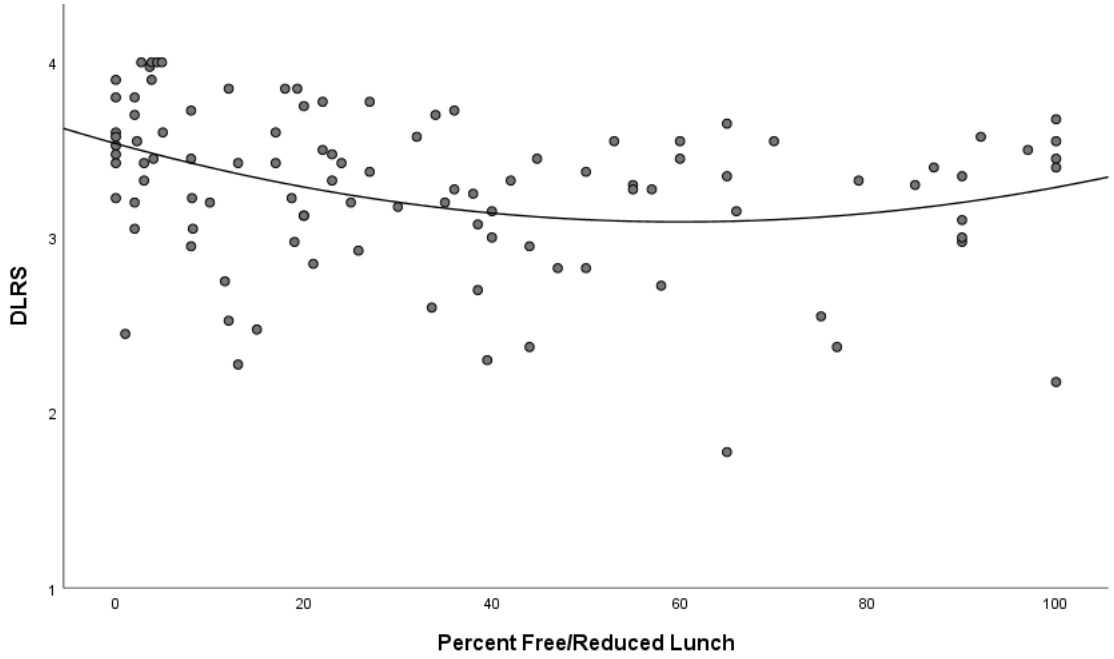

Figure 4. Scatterplot of DLRS by percent free/reduced lunch.

The fitted curve shows a convex relationship between the DLRS and Percent Free/Reduced Lunch variables. The perceived distributed leadership readiness is highest when the percent free/reduced lunch is the lowest. Principals' perceptions drop as the percent free/reduced lunch increases, however, the principals' perceptions start to increase again with the higher percent free/reduced lunch. Principals with high levels of free/reduced lunch may begin to work with various groups in and out of the school to support students. Mobilizing state and community resources to assist students in poverty may have principals sharing decision-making with community leaders.

Principals' Distributed Leadership Readiness and Student Test Scores

Figure 5 shows a boxplot of the percent of students meeting or exceeding expectations on the English and Math NJSLA.

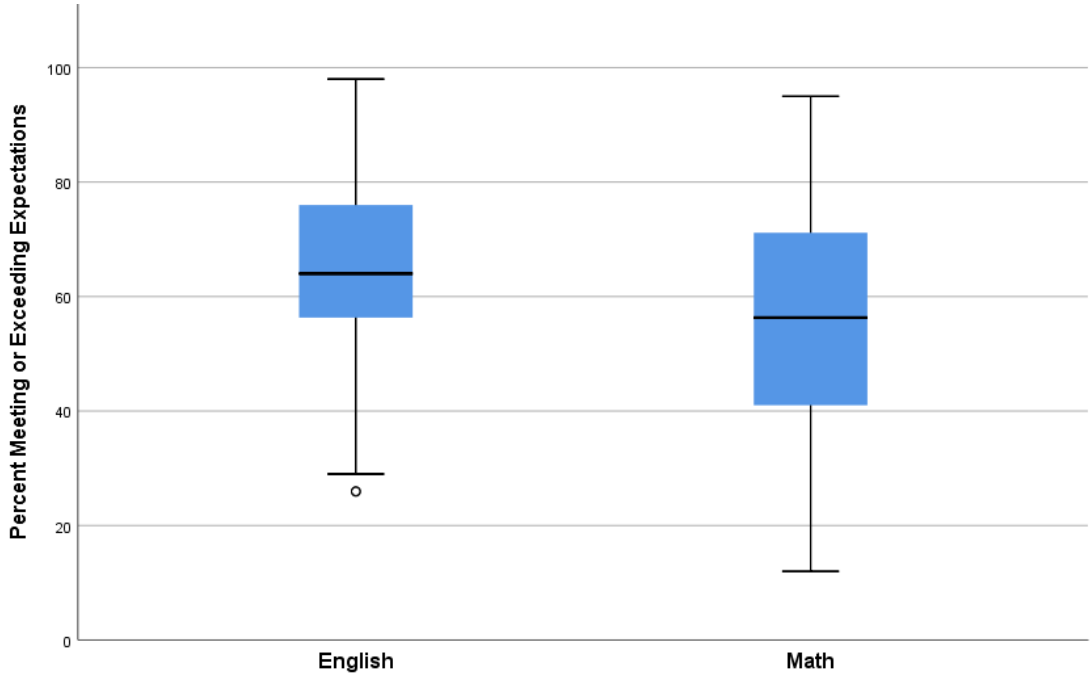

Figure 5. Boxplot of English and Math.

The English boxplot shows a wide range of 72%, with the minimum value of 26% considered an outlier. The Math boxplot shows a range of 83%, which is a wider spread than the English distribution. The Math boxplot appears to be fairly symmetrical, while the median in the English boxplot is closer to the 25th percentile than the 75th percentile. However, the median for the English NJSLA is 64% of students meeting or exceeding expectations, while the median for the Math NJSLA is 56% of students meeting or exceeding expectations. The percent of students meeting or exceeding expectations on the English NJSLA has a standard deviation of 17.9 while the standard deviation for the Math NJSLA is 20.7.

English student test scores. The average percent of students meeting or exceeding expectations on the English NJSLA is 64% for the responding principals with a minimum of 26% and maximum of 98%.

In order to determine the relationship between principals' distributed leadership readiness score and student test scores, I model the percent of students meeting or exceeding expectations on the English NJSLA as a function of the DLRS score and school characteristics. Table 6 reports the estimated coefficients for all English NJSLA models.[2]

Table 6

Predictors of English NJSLA Scores

	English NJSLA				
	Model 1	Model 2	Model 3	Model 4	Model 5
DLRS scores	7.76**	0.92	-29.60		3.22
	(3.88)	(3.25)	(31.69)		(5.68)
DLRS scores- squared			4.91		
			(5.08)		
DLRS scores - 2nd quartile				5.18	
				(3.85)	
DLRS scores - 3rd quartile				6.75	
				(3.82)	
DLRS scores - 4th quartile				3.08	
				(4.07)	
DLRS scores * number of staff (in 10s)					-0.31
					(0.62)
Constant	38.50***	84.57***	131.08***	83.82***	77.54***
	(12.87)	(12.10)	(49.55)	(4.75)	(18.70)
School characteristics	X	X	X	X	X
N	102	102	102	102	102
Adjusted R-square	0.03	0.43	0.43	0.44	0.42

Notes: * p<0.10, ** p<0.05, *** p<0.01.

[2]I estimated a series of models with principal characteristics and found similar results.

Model 1 is a baseline bivariate regression model with the DLRS scores as the independent variable. The coefficient for DLRS is 7.76, which is significant in this model. For every one unit increase in the DLRS score, the percent of students meeting or exceeding expectations on the English NJSLA increases by 7.76%.

Figure 6 shows the scatterplot of DLRS by English NJSLA with a fitted curve.

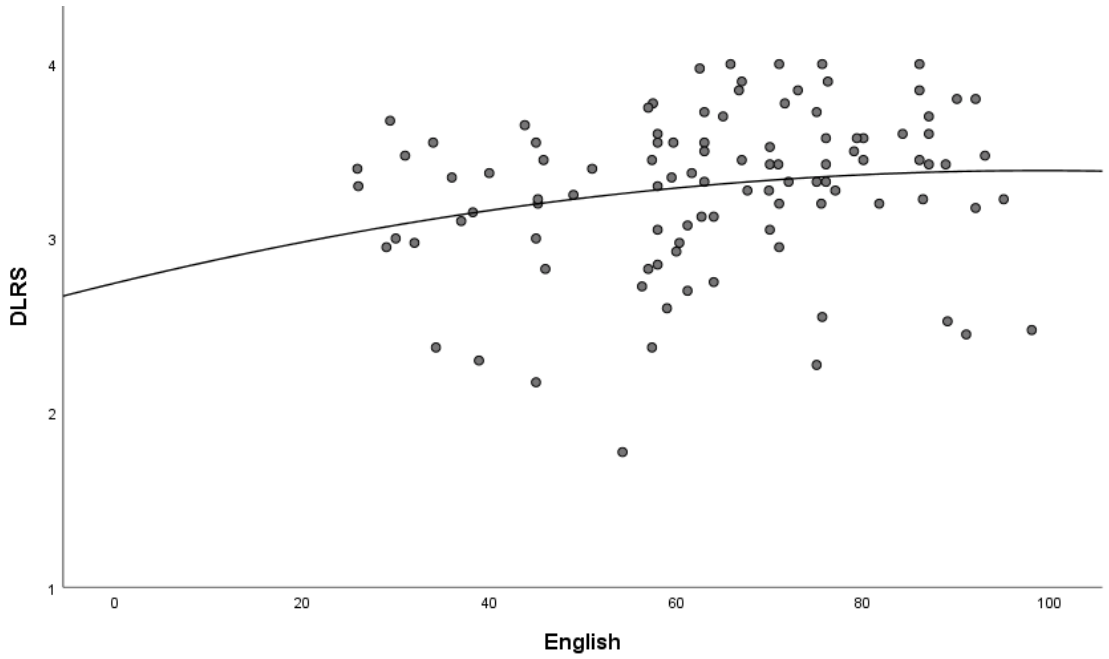

Figure 6. Scatterplot of DLRS by English.

The fitted curve shows a slightly concave relationship between the DLRS and English variables. The perceived distributed leadership readiness is highest when the percent of students meeting or exceeding expectations on English NJSLA is the highest. Principals' perceptions increase as the percent of students meeting or exceeding expectations on English NJSLA increases, although not a constant increase.

Model 2 adds school characteristics to Model 1. The DLRS scores become insignificant and are indistinguishable from zero. This suggests that DLRS scores are positively correlated with school characteristics, which are also positively correlated with English achievement, making the coefficient in Model 1 biased upward. The model does not include principal characteristics because the DLRS score reflects part of the principal characteristics.

Non-linearity. It is possible that distributed leadership may have a non-linear relationship with English achievement. Schools that practice distributed leadership may be more likely to have structures in place to support professional learning communities (PLCs). Schools with PLCs may have a relationship with English achievement that increases scores at a non-constant rate. I added a square term of the DLRS scores and dummy variables for quartiles with the first quartile being a reference group in Models 3 and 4, respectively, to test the existence of non-linearity. I find no evidence that the relationship is non-linear. All coefficients on these terms are insignificant.

Interactions. The value of the coefficient and significance may change if the number of staff is very large or very small because schools with these extreme sizes could lead to a different management experience for principals. To determine if the relationship between DLRS scores and English NJSLA depends on the value of the number of staff members (in 10s), an interaction term was added for Model 5. It shows no evidence on the interaction effect. The number of staff members does not moderate the relationship.

Principals' Distributed Leadership Readiness and Math Student Test Scores

The average percent of students meeting or exceeding expectations on the Math NJSLA is 55% for the responding principals with a minimum of 12% and maximum of 95%.

I perform the same set of analyses for math test scores. I model the percent of students meeting or exceeding expectations on the Math NJSLA as a function of the DLRS score and school characteristics. Table 7 reports the estimated coefficients for all Math NJSLA models.[3]

[3]I also estimated a series of models with principal characteristics and found similar results.

Table 7

Predictors of Math NJSLA Scores

	Math NJSLA				
	Model 1	Model 2	Model 3	Model 4	Model 5
DLRS scores	9.39**	2.37	-13.98		-0.07
	(4.49)	(3.89)	(40.07)		(6.79)
DLRS scores- squared			2.19		
			(6.42)		
DLRS scores - 2nd quartile				2.29	
				(4.64)	
DLRS scores - 3rd quartile				5.92*	
				(4.89)	
DLRS scores - 4th quartile				1.26	
				(5.17)	
DLRS scores * number of staff (in 10s)					0.33
					(0.75)
Constant	24.14	75.15***	108.13*	79.61***	82.59***
	(14.90)	(14.45)	(58.99)	(5.64)	(22.35)
School characteristics	X	X	X	X	X
Adjusted R-Square	0.03	0.39	0.39	0.40	0.39
N	103	103	103	103	103

Notes: * p<0.10, ** p<0.05, *** p<0.01.

Model 1 is a baseline bivariate regression model with the DLRS scores as the independent variable. The coefficient for DLRS is 9.39, which is significant in this model. For every one unit increase in the DLRS score, the percent of students meeting or exceeding expectations on the Math NJSLA increases by 9.39%.

Figure 7 shows the scatterplot of DLRS by Math NJSLA with a fitted curve.

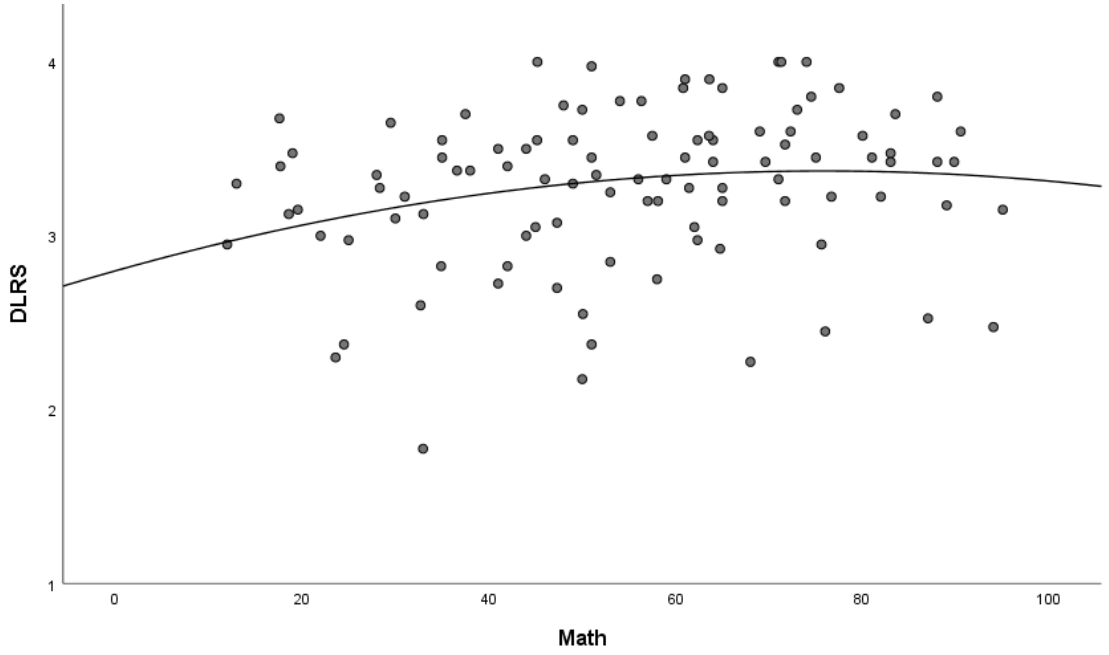

Figure 7. Scatterplot of DLRS by Math.

As with English, the fitted curve shows a concave relationship between the DLRS and Math variables. Principals' perceptions increase as the percent of students meeting or exceeding expectations on Math NJSLA increases at a non-constant rate. However, the DLRS scores do start to decrease for the higher percentages of students meeting or exceeding expectations on the Math NJSLA.

Model 2 adds school characteristics to Model 1. The DLRS scores become insignificant and are indistinguishable from zero. This suggests that DLRS scores are positively correlated with school characteristics, which are also positively correlated with math achievement, making the coefficient in Model 1 biased upward. The model does not include principal characteristics because the DLRS score reflects part of the principal characteristics.

Non-linearity. It is possible that distributed leadership may have a non-linear relationship with Math achievement. Schools that practice distributed leadership may be more likely to have structures in place to support professional learning communities (PLCs). Schools that incorporate PLCs may have a relationship with Math achievement that increases scores at a non-constant rate. I added a square term of the DLRS scores and dummy variables for quartiles with the first quartile being a reference group in Models 3 and 4, respectively, to test the existence of non-linearity. In Model 3, I find no evidence that the relationship is non-linear. Model 4 shows a significant coefficient for the third quartile at the 0.10 significance level. The coefficients for the second and fourth quartiles are insignificant. Model 4 shows minimal evidence that the relationship is non-linear.

Interactions. To determine if the relationship between DLRS scores and Math NJSLA depends on the value of the number of staff members (in 10s), an interaction term was added for Model 5. It shows no evidence on the interaction effect. The number of staff members does not moderate the relationship.

Summary of Results

This study sought to determine if there is a relationship between distributed leadership and student achievement. The first research question found that New Jersey principals have a high perception of their distributed readiness with a mean DLRS score of 3.29. The study also looked at characteristics that are associated with high levels of distributed leadership. Principals who identify as Black/African American were found to have a lower perceived distributed leadership readiness. In addition, principals of city schools have a DLRS score higher than principals of suburban schools. Principals with a smaller staff have a higher DLRS perception level. Lastly, principals with a higher

percentage of students with free/reduced lunch have a lower perceived distributed leadership readiness.

In order to determine if principals' perceived Distributed Leadership Readiness has a relationship with student achievement, I estimated models between the DLRS scores and the percent of students meeting or exceed expectations on the English and Math NJSLA. When the DLRS score was the only independent variable in the model, it was a significant predictor for the English and Math NJSLA. However, after including school characteristics in the models, the DLRS score was no longer a significant predictor for English nor Math NJSLA. Ultimately, the significant predictors of student achievement are two school characteristics, the percent of chronic absenteeism and the percent of students with free/reduced lunch. As a result, the perceived distributed leadership readiness of the responding principals does not have a significant relationship with the percent of students meeting or exceeding expectations on the English nor Math NJSLA.

Chapter 5

Conclusions and Discussion

This chapter includes the summary, discussion, implications, and limitations of this research study. The purpose of this quantitative study was to examine the properties of the distributed leadership readiness survey scores and to investigate whether the scores have a relationship with student test scores. The design of this research was to analyze survey data from principals in New Jersey to attempt to answer each of the proposed research questions.

Research Questions

1. What is the level of New Jersey public school principals' perceptions about their distributed leadership readiness?
2. What are the main predictors of a New Jersey principal's readiness score?
3. What is the relationship between principals' distributed leadership readiness score and student test scores?

The sample for this study was principals from public school districts in New Jersey. There were 2,227 public school principals in New Jersey that met the requirements of the study. Although 201 principals responded to the survey with a response rate of 9%, only 103 principals responded to every question in the survey for use in analyses. The sample size does not have strong statistical power to detect a relationship that may exist in the population.

The design of the research study included the collection of data using one instrument with two parts: a pre-survey and the Distributed Leadership Readiness Scale (DLRS) survey. The pre-survey contained demographic questions as well as school

characteristic questions. The DLRS survey was used to measure the perceived distributed leadership readiness of the responding principals. The DLRS survey contained 40 items and used a four-point Likert scale, asking principals if the action occurred continually to rarely/never in the school. The DRLS survey grouped the items into four dimensions of distributed leadership.

In education there is a growing consensus among educators that distributed leadership is a characteristic of high-achieving schools (Heck & Hallinger, 2010; Paulsen et al., 2016). The principal is forced to play many roles in schools from instructional leader to disciplinarian to facilities director (Fink, 2018). In order to successfully implement distributed leadership in schools, principals can expand their capacity by providing his/her staff with opportunities to participate in the decision-making and implementation of school management and procedures building leadership capacity for the entire staff (Elmore, 2000; Gronn, 2000; Spillane et al., 2008).

In the race to raise student achievement through test scores, new ways of thinking about leadership and leadership practice in our schools are needed. Leadership in schools has been a topic in the education literature for over 30 years (Harris, 2002; Leithwood & Mascall, 2008; Leithwood et al., 2009). Leadership is an important component of school performance because school leaders set the school's culture, mission, vision, and goals (Menon, 2013).

Summary of the Results

This study sought to determine the relationship, if any, between distributed leadership and student achievement test scores. The first research question found that New Jersey principals have a high perception of their distributed leadership readiness

with a mean DLRS score of 3.29. The average scores of each dimension of the DLRS showed that Shared Responsibilities is the dimension that principals believe they practice most often. This was followed sequentially by School Culture; Mission, Vision, and Goals; and finally Leadership Practices.

The study also looked at characteristics that are associated with high levels of distributed leadership. Principals who identify as Black/African American were found to have a lower perceived distributed leadership readiness. In addition, principals of city schools have a DLRS score higher than principals of suburban schools. Principals with a smaller staff have a higher DLRS perception level. Lastly, principals with a higher percentage of students with free or reduced lunch have a lower perceived distributed leadership readiness.

For the third research question, the study found that the perceived distributed leadership readiness of the responding principals does not have a relationship with NJSLA scores for English nor Math.

Discussions

In this study, distributed leadership was measured using the distributed leadership readiness survey. This was a self-evaluation survey to provide a profile of New Jersey principals' readiness to apply distributed leadership practices. This survey measured four dimensions of distributed leadership: Mission, Vision, and Goals; School Culture; Shared Responsibility; and Leadership Practices. These dimensions were derived from *Building a Structure for School Leadership* (Elmore, 2000). This distributed leadership readiness score in conjunction with principal and school characteristics were used to address the research questions.

Properties of the DLRS Scores

In an era of accountability, the role of the principal has changed, and principals must adapt to this new reality. There are many advocates of distributed leadership, but ultimately it is the principal who needs to establish the framework and procedures for distributed leadership in schools. However, there have been few studies regarding the perceptions of principals on distributed leadership (Maltempi et al., 2019). In this study, New Jersey principals rate themselves highly for practicing distributed leadership across all four dimensions, and consequently, the overall DLRS. Three other dissertation studies from Missouri, Mississippi, and Connecticut found that principals from their respective states rated themselves highly for distributed leadership practice (Christy, 2008; Gordon, 2005; Zinke, 2013). Although all surveys reported high scores for practicing DLRS there was a difference in how they ranked the different dimensions. This study found that New Jersey ranked Shared Responsibilities as the dimension practiced the most, followed by School Culture; Mission, Vision, and Goals; and lastly Leadership Practices. In Connecticut, Missouri, and Mississippi, principals saw School Culture as the area where distributed leadership was practiced the most followed by Mission, Vision, and Goals, Shared Leadership, and lastly Leadership Practices. It is interesting that all four states ranked Leadership Practices last among the dimensions.

The Leadership Practices questions on the survey dealt with the implementation of distributed leadership by providing others with leadership roles. For example, the Leadership Practices dimension asks the questions:

1. Does the school expand its capacity by providing professional staff formal opportunities to take on leadership roles?

2. Do teachers who assume leadership roles in the school have sufficient school time to permit them to make meaningful contributions to the school?

These examples get at the heart of distributed leadership practice. While all four dimensions are important to the implementation of distributed leadership, Leadership Practices may be one of the best indicators if the practice is actually happening. It is also not surprising that Missouri, Mississippi, and Connecticut rank School Culture highly because distributed leadership has been linked to improving culture and climate in schools (Angelle, 2010).

The high perceived distributed leadership scores could be supported by the idea that distributed leadership can be found in a growing body of literature and more schools and districts are attempting to implement distributed leadership (Harris, 2009; Leithwood et al., 2009; Spillane et al, 2008). In addition, many states have begun to add dimensions of distributed and shared leadership to their principal evaluation instruments (Stronge et al., 2013). This high perceived level of distributed leadership readiness can be viewed as a positive result for increasing the use of distributed leadership in schools. The strong perceived distributed leadership of New Jersey principals indicates that New Jersey principals' actions involve incorporating others in decision-making process. This acknowledgement of sharing and distributing leadership among formal and informal leaders demonstrates a commitment to democratic principles.

The finding of a high level of perceived distributed leadership readiness in New Jersey is not surprising. In New Jersey, the concept of distributed leadership and shared leadership are included in policies and statutes (New Jersey Department of Education, n.d.). This could be because New Jersey has a strong teacher association which helps

drive policy. The New Jersey Education Association (NJEA) actively lobbies the state legislature on education initiatives. One of their primary goals has been to give teachers more of a voice in how schools operate. New Jersey uses a multitude of teacher evaluation systems. Teachers and NJEA officers had a voice in choosing the evaluation systems (Paxton, 2016). The five most used evaluation systems account for 95% of school districts in New Jersey (Comparison of Teacher Evaluation Models, n.d.). The top five most frequently used evaluation systems in order are Charlotte Danielson Framework for Teachers, Stronge Teacher and Leader Effectiveness Performance System, Mid-Continent Research for Education and Learning (McREL) Teacher Evaluation Standards, Marzano's Causal Teacher Evaluation Model, and The Marshall Rubrics (NJ Spotlight, 2013). All of these models incorporate shared leadership and decision-making in their rubrics. This corresponds with high level of perceived practice by New Jersey principals.

Predictors of DLRS Scores

While the study found that Black/African American have a lower perceived distributed leadership readiness, it is important to recognize that Black/African Americans were underrepresented in participation. This means that the results cannot be generalized to the population. Yet, this finding does imply that other factors may be more important to Black principals than shared leadership. Tillman (2008) discusses how Black principal leadership focuses more on social justice issues for marginalized groups. In order to ensure that marginalized students' needs are met, Black principals may feel the need to be more directive in their decision-making to stay true to that vision and goal (Byron & Brown, 2007).

The results also found that schools with smaller staff sizes have higher perceived distributed leadership scores. This may be possible because it can be easier for principals to organize a smaller staff than to include all members of a very large staff. Higher degrees of organizational skills may be needed to develop structures and frameworks to maximize the collective intelligence of a larger staff.

Experience and education were factors identified to have a relationship with distributed leadership readiness. These findings were not surprising as principals who have the benefit of a number of years of experience may have developed trust and relationships with their staff. They may also recognize the benefit of incorporating other leaders to lessen the burden of leadership. In addition, principals with terminal degrees are more likely to be well-versed in the literature of leadership. Distributed leadership has growing support in education literature (Leithwood et al., 2009; Spillane et al., 2008). In fact, these two factors showed a non-linear relationship between a principal's years of experience, suggesting that the more experience and education principals have, the better they may be at implementing distributed leadership.

New Jersey public schools located in a city have a higher perceived score while principals with a higher percentage of students with free or reduced lunch have a lower perceived distributed leadership readiness score. This is an unexpected and interesting finding because the majority of city schools in New Jersey are Title I schools (nj.gov, n.d.). A Title I school is a school receiving federal funds because they have a large concentration of low-income students (Givens, 2013). One may expect the city DLRS to work in parallel with the free or reduced lunch scores, but that was not the result of this study. Klar (2012) studied three urban principals practicing distributed leadership and

found the Smart City Initiative Design (SCID) Framework to be influential in encouraging schools to build organizational capacity to meet accountability demands. Other city school leaders may be influenced by this framework to promote distributed leadership practices.

The two variables that have the greatest relationship with student test scores are the percent of chronic absenteeism and the percent of students with free or reduced lunch. An overwhelming amount of chronically absent students must deal with impoverished conditions (Cutillo, 2013). These students encounter issues ranging from stresses such as childcare, higher rates of illness, violence, and are more likely to be transient students. These findings confirm what many social justice advocates have stated; there are a tremendous number of out-of-school factors that affect student achievement (Ravitch, 2013; Tienken, 2012). Despite this evidence, policymakers continue to use state-mandated tests as the basis for teacher and principal evaluations. These test results are then used to measure the effectiveness of the principal and can be the basis for decisions about the principal's compensation, retention, promotion, tenure, and certification (Tienken, 2012). The existing research on using test scores to measure principal effectiveness is tenuous (Grissom et al., 2015). Chiang et al. (2016) measured principals' performance based on student achievement data and determined that that test scores do not accurately predict the impact of the principal on student achievement. These findings further speak to the idea that schools and communities need to work together to address student and family trauma by providing things like health care, employment training, and funding to impoverished areas.

Null Relationship Between the DLRS Scores and Test Scores

The study found that the perceived distributed leadership readiness of the responding principals does not have a relationship with NJSLA scores for English nor Math. While discussing the findings of this research, it is important to mention that several research studies predict a correlation between leadership and student achievement (Harris, 2008; Leithwood et al., 2009). These studies discuss the proposed benefits of distributed leadership on student achievement (Danielson, 2006; Heck & Hallinger, 2010; Leithwood et al., 2010; Murphy, 2005; Spillane et al., 2008). There is a body of literature that suggests that increasing teachers' input in the decision-making process improves schools (Danielson, 2006; Heck & Hallinger, 2010; Leithwood et al., 2010; Murphy, 2005; Spillane et al., 2008). Much of the research on distributed leadership has been qualitative in nature. More quantitative studies are needed to build the foundation of literature on distributed leadership (Leithwood et al., 2009). This study was designed to add more quantitative research to the body of literature on distributed leadership. Although this research did not find a correlation between perceived distributed leadership readiness and student achievement test scores, this may not necessarily indicate that distributed leadership does not contribute to student achievement. There are several reasons, including principal perceptions compared to actual behaviors, mediators of implementing the conceptual framework, appropriateness of distributed leadership for student achievement, and methodological issues.

Perception and actual behaviors. Research in psychology finds that perceptions deviate from actual behaviors. Argyris and Schon (1974) discuss the need for examining a person's espoused theory for their theory-in-action. In this study, distributed leadership

readiness scores are measured through principals' perceptions, not necessarily based on their actual behaviors observed by third parties. Although many principals espouse the practice of distributed leadership, many teachers may not feel that it is practiced to the degree in which the principal professes. A principal may meet resistance while trying to meet the needs of a diverse faculty with competing interests. This disconnect is an important one to examine because principals are asked to remember the degree to which they implemented distributed leadership in 2018-2019 school year. This could cause measurement error, in particular recall bias. Recall bias can occur whenever an attempt is made to collect data retrospectively, as human memory is imperfect (Sackett, 1979). A rise in such measurement error can cause attenuation bias, which shifts estimated coefficients towards zero and lowers the value of the t-statistic, leading to insignificant results.

The best way to examine this relationship is through soliciting 360-degree feedback. Future studies may include responses from the principal's supervisor, peers, and staff to ascertain if their perceptions match their practice (Goleman et al., 2001). This will give researchers better ability to analyze whether a principal's perceptions match his or her actions.

Possible problems in theory of action. One of the key mediators linking leadership to teachers and ultimately student achievement is trust (Bryk & Schneider, 2002). School policies have the power to influence the ways in which principals lead. When there is a climate and culture in which distributed leadership is encouraged, principals will be willing to take risks in sharing responsibilities and decision-making with others (Maltempi et al, 2019). Relationship-building is at the heart of leadership, and

principals need to make sure they have a cohesive vision and implementation plan to make distributed leadership fruitful. Otherwise, it could lead to a tangled mess with limited accountability over who is responsible (Yadav & Agarwal, 2016). If trust is not established, it is highly unlikely that teachers will take on leadership roles. Leadership involves taking risks and teachers who do not feel supported will not take on the extra workload or burden of decision-making if they do not trust that they will be supported (Smylie, et al., 2005). Teacher-leadership positions may indirectly influence student achievement through their effect on teacher motivation and work conditions (Sun & Xia, 2018).

The conceptual framework of this paper provides a link for distributed leadership's influence on student achievement test scores, however, there are several potential barriers to implementing the conceptual framework. While the literature describes distributed leadership as granting decision-making authority to various roles and committees within the school, and moving away from a singular leader, what that looks like in practice can vary from school to school and issue to issue (Hallinger & Heck, 1996).

Distributed leadership may be viewed more as a spectrum rather than a checkbox. Some proponents of distributed leadership advocate for a holacracy where leadership is totally decentralized, while others on the opposite end of the spectrum may insist a council that advises the principal is appropriate (Holloway & Sgambelluri, 2019; Robertson, 2015). These various definitions, while all representing similarity in theme, can lead to confusion and inconsistency during practice. These various definitions, while

all degrees of distributed leadership, help to clarify possible inconsistencies in defining the concept and implementing it with consistency.

There are also times when leaders may not feel that distributed leadership is appropriate to practice. During a crisis, some principals may feel that the schools need a strong central leader to take charge and coordinate efforts, although this viewpoint is not shared by all (Maltempi et al, 2019). During the spring of 2020, New Jersey schools were forced to close due to the COVID-19 pandemic. A directive was issued from the state to initiate remote-learning with little notice or resources provided. In situations such as this it can be beneficial to have a hierarchical structure to disseminate information and improve coordination. Distributed leadership may lead to having "too many chefs in the kitchen." Distributed leadership's strength comes from taking in multiple viewpoints and reaching consensus, but this could take a lot of time, time that may not be available during a crisis.

Another issue that may arise from the teacher-leaders is dual roles and responsibilities. The expectations for a teacher to not only plan lessons, manage classroom behaviors, communicate with parents, track data, and develop social-emotional skills while balancing new expectations for leadership may be unrealistic. It is possible that increased distributed leadership demands on teachers can put a demand on their time while limiting their effectiveness in the classroom (Holloway et al, 2018).

Appropriateness of student test scores as DL outcomes. For over twenty years, education reformers and researchers have searched for instructional and leadership strategies that impact student outcomes (Jacob et al., 2019). This study did not uncover a relationship between distributed leadership and student achievement test scores. These

findings were unexpected because previous studies found a correlation between distributed leadership and student achievement (Spillane, 2006). In addition, these findings are contradictory of the study that the DLRS survey is based on. Gordon's (2005) findings in his dissertation showed a direct relationship between the distributed leadership dimensions and higher student performance. This study also only looked at test scores from 4th, 8th, and 10th grade. It is possible that there is a positive relationship if you were to look at other grade level assessments.

Although this study did not find a direct relationship between distributed leadership and student achievement test scores, an indirect effect on student achievement is supported in the current distributed leadership literature (Gronn, 2002; Harris & Lambert, 2004; Spillane et al., 2008). This indirect effect could be at the heart of the importance of distributed leadership. By building capacity and making sure that voices are heard from all stakeholders, it gives staff a sense of value and importance in the school. When people feel valued and connected to the organization, they will work harder and put more effort into their endeavors (Ganz, 2010). This trickle-down effect benefits the student experience from social experiences to academics.

With these ideas in mind, it may be important for future researchers to find better outcome indicators for distributed leadership than test scores. As test scores were used in this research study to measure student achievement, it can be argued that other factors are more important to educating the whole child (Millman, 1997; Schneider, 2017). Instead of test scores, concepts like student involvement in extracurricular activities or students attending post-secondary education may be better indicators of a lasting leadership effect on achievement. Woods et al. (2016), argues that leaders who focus on developing the

whole child believe that leadership is all about relationship-building. Another avenue that could be explored is a connection to teacher involvement and turnover rate. The byproduct of this could be increased achievement for students. This idea of teacher empowerment may lead to greater job satisfaction and a more collaborative school culture (Sun & Xia, 2018). This can build teacher efficacy and effect student achievement.

Endogeneity of DLRS scores. There are also other variables that may positively influence DLRS scores, but negatively influence student achievement that were not able to be collected for this research. Conversely, there may be factors that negatively influence DLRS scores, but positively influence student achievement. Omitting these factors leads to a downward bias on the estimate, leading to a lower p-value and hence statistical insignificance.

One variable that could influence distributed leadership and student achievement is the principal's philosophy on state testing. In the spring of 2019, New Jersey changed their state test from PARCC to NJSLA. This change was in response to political pressure from government officials, parents, and teacher unions who did not support the test. Some principals put a great deal of emphasis on the state test, scheduling classes for practicing test-taking strategies. This directive initiated by the principal without teacher support may hurt distributed leadership. Studies have found that students who take preparatory classes for standardized tests show an increase in scores (Roszkowski & Spreat, 2016). Principal directed initiatives that promote explicit test preparation without teacher support may hurt the school's ability to implement distributed leadership, and

because preparatory test practice is positively correlated with student achievement, the model may be bias downwards.

In addition, because principals chose whether or not to respond to the survey, this may have led to selection bias, more specifically non-response bias. The people who respond to the survey will normally be different from those who choose to ignore the survey (Sackett, 1979). For example, since the research study involves distributed leadership, you may have more responses from people who care deeply about distributed leadership and practice it regularly.

While distributed leadership has been promoted by many educational reformers as an important component of school improvement, we must be careful in making these claims without empirical evidence. Policymakers are notoriously fond of new theories or labels for leadership that are often enacted without any backing of empirical inquiry (Harris, 2008). New leadership theories are regularly packaged as the next big thing, and successfully sold to schools without adequate scrutiny. These leadership theories are offered as "silver bullet" practices. Unfortunately, more empirical research is needed on distributed leadership before it should be instituted in educational policy.

The fact that distributed leadership was not found to have a direct significant impact on student achievement test scores does not dismiss its potential benefits. A lot of qualitative evidence has been collected about its benefit, although concrete quantitative proof still eludes researchers. Recent policy discussions including NJPSA, NJEA, and ASCD have suggested broad support for expanding teacher leadership opportunities including a teacher-leader certification track (NJPSA, n.d.). In 2019, NJPSA announced their teacher-leader certification. This can be viewed as a step to promote distributed

leadership and supports the notion that another job of a principal is to work to develop teacher-leaders.

Reliability of results. The confidence intervals for the estimated regression coefficients can provide additional information about the results that did not show a significant relationship between DLRS and student achievement test scores. We can be 95% confident that a one-point increase in the DLRS score is associated with -5.54% to 7.38% increase in students meeting or exceeding expectations on the English NJSLA. Because the confidence interval includes 0, there is no evidence that DLRS and English NJSLA are related. In addition, we can be 95% confident that a one-point increase in the DLRS score is associated with -5.35% to 10.09% increase in students meeting or exceeding expectations on the Math NJSLA. Similarly, because the confidence interval includes 0, there is no evidence that DLRS and Math NJSLA are related. These wide intervals indicate that we have limited knowledge about the effect due to the small sample size. It is recommended that conclusions drawn from this research would be replicated with larger sample sizes.

Most research on null findings has focused on the limitations of a study, but it is important for researchers to look beyond this and ask questions about interpretation of terms, implementation issues, and other competing issues. While researchers plan their research to test whether a concept works, they should also consider "how to make things work better" (Landis et al., 2014). Researchers must also examine other useful information that has been gleaned from the study. Discovering interventions that directly impact student achievement has been the holy grail of education research. Most of these studies, including this one, measured achievement by standardized test scores. These

studies are likely to yield null findings and may suffer from publication bias (Hubbard & Armstrong, 1997). Jacob et al. (2019) states that this is because we must ask several questions about what constitutes a null finding. Is the impact precisely zero, was it not statistically significant, or was it significant, but too small to have meaning? Jacob et al. (2019) reviewed studies from the What Works Clearinghouse and found about half the results that met the organization's standards had null results.

Limitations

The results of this study contribute to the educational research literature on distributed leadership. Any interpretation of these findings must be made in the context of the limitations of the research. Specifically, the self-reporting nature of the survey data relied on the participants' level of self-awareness of his/her distributed leadership readiness, and the honesty and accuracy of responses in describing principal and school characteristics and test scores. Survey estimates of behavior deemed to be prosocial often include higher rates of these behaviors (Brenner & DeLamater, 2016). Although self-report ratings were consistent, studies show that participants' perceptions may not match the individual's actual behaviors (Fisher et al., 2014; Huffman, 2014). Because of the anonymous nature of this study, it was not possible to triangulate the principals' espoused perceptions of distributed leadership readiness with his/her teachers' perceptions. Another limitation of the study is the relatively low response rate. Although the sample size of just over 100 is not too small and does not necessarily increase Type II error, any statistical tests performed on this sample still have weak statistical power to detect a relationship that may actually exist in the population.

An additional limitation of the study is that the sample is not representative of the population of New Jersey principals. The race/ethnicity demographics of principals in this survey differ somewhat from that of the demographics of all principals in New Jersey. Principals identifying as Black/African American are underrepresented, while principals identifying as White are overrepresented. Consequently, the results cannot be generalized to all principals in New Jersey.

Implication of the Results for Practice

Using the DLRS and school data, this quantitative study was unable to find a relationship between distributed leadership and NJSLA test scores. This has implication for principals and school leaders about the benefit that distributed leadership may have in regard to student achievement test scores. Distributed leadership may serve as a way to build relationships and trust in schools and be part of a comprehensive strategy to raise student test scores, but distributed leadership in isolation will likely not improve test scores.

Principals need to strongly communicate the mission, vision, and goals of the school along with the expectations for school culture; shared responsibility; and leadership practices. Leadership practices was lowest scored dimension for New Jersey principals who replied to the survey. This area focuses on providing opportunities for staff members to participate in leadership roles. In addition to the opportunity to lead, the leadership practice dimension tasks principals with providing time and resources to enact this leadership role. This is an important area of development for implementing distributed leadership in schools. It involves building trust and relationships with staff members to enact the school's mission.

The DLRS is a self-evaluation scale intended to provide a profile of a school's willingness to engage in shared leadership practices. The DLRS was developed by the Connecticut State Department of Education (CSDE) to measure a school's readiness to share leadership. It was based on research on school leadership designed to improve public schools' ability to increase student academic achievement (Gordon, 2005).

These claims for distributed leadership are not insubstantial or insignificant. In the age of accountability, principals are encouraged to create a school environment that allows individuals the opportunity to make a significant contribution to the organization (Spillane et al., 2008). If a few of the benefit claims of distributed leadership were to come to fruition, the effects on a school's culture and student achievement could be significant.

The results of this study may also speak to the need to further clarify and instruct policymakers, superintendents, principals, and school personnel on distributed leadership practices. The survey results relied on principals' perceptions and interpretations of distributed leadership, which may vary from individual to individual. Ideas of distributed leadership can run the gamut from a principal encouraging staff to take on leadership roles, to a school-wide decision-making structure. It may entail professional learning communities (PLCs) making instructional decisions on how to best approach a lesson, to a committee of students and staff planning a school dance. More uniform professional language may result in closer interpretation of leadership practices.

Although there is increasing literature to move away from a singular leadership, it does not negate the idea that schools need a strong and democratic leader to implement these practices. It is important to concentrate on the development of the school principal

because he/she is charged with implementing the school's leadership strategy (Harris & Lambert, 2004). Distributed leadership requires strong coordination and leadership from the principal. This concept leads some scholars to determine that distributed leadership may not lower the workload of the school principal (Louis et al., 2010).

While distributed leadership among teachers may be desirable, some caution needs to be expressed about the potential difficulties involved. Distributed leadership implemented haphazardly can result in conflicting priorities, targets, and timescales, therefore having the opposite effect it was intended to achieve. To avoid this pitfall, principals need to lead together and collaboratively with teachers and the community (Hargreaves & Fullan, 2013). Leadership and achievement are collective endeavors, not individual pursuits.

Recommendations

Researchers.

1. Conduct more studies to understand the relationship between distributed leadership and student achievement in New Jersey and other states because results from one study should not be considered in isolation (Jacob et al., 2019).

2. Conduct additional quantitative studies with a larger sample response and quantitative data.

3. Conduct mix method studies that triangulation of findings with observations, interviews and/or teacher surveys.

Policymakers.

1. Implement policies at the state and local levels that support the expansion of teacher leadership opportunities.

2. Encourage professional organizations to create teacher-leader certification.

Conclusion

The contemporary quantitative literature on distributed leadership effectiveness is mixed (Harris, 2008). Karadağ et al. (2015) conducted a meta-analysis that revealed that educational leadership had a medium-level positive effect on student achievement. However, there are debates in the literature whether this is a direct or indirect effect. Gronn, whose work was seminal in cementing distributed leadership in the literature, has indicated that despite the potential benefits that distributed leadership may have, proponents need to take caution in that observed leadership may be unremarkable or inconsistent (Harris, 2009). In the literature, examples of distributed leadership encompass principals encouraging the faculty to take on leadership roles, to district-wide implementation of structures that support shared decision-making. It could also be applied to grade-level or department-level decision-making on budget or instructional decisions. These varying interpretations can cause difficulty with determining the effect of distributed leadership.

As schools become more complex organizations, this high perception of distributed leadership may help reduce principal and teacher burnout and turnover (Leithwood, Mascall, & Strauss, 2009; Murphy, 2005; Spillane, Camburn, Pustejovsky, Pareja, & Lewis, 2008). In addition to being instructional leaders, principals are managing operations in the school, engaging with parents and community members, accountable for school finances, performing teacher evaluations, and enacting all state mandates, policies, and laws. Distributed leadership offers a vehicle for principals to address these responsibilities.

The assertion that distributed leadership is the cure to closing the achievement gap or improving student achievement, at the moment, seems like a leap. More quantitative evidence still needs to be collected before distributed leadership can be considered a solution for educational woes. Policymakers have been ahead of the evidence in their endorsement of distributed leadership as a means to bring about effective schools. While the benefits of distributed leadership may be limited to indirect effects, educators should still be cautiously optimistic about its promise for schools. The literature does support enacting shared leadership through promoting schools as learning organizations, professional learning communities, and communities of practice to harness the collective talents of the staff for student benefit. For schools to learn and grow, principals need to expand the circle of leadership to incorporate the knowledge and motivation of the entire organization (Fullan, 2011). Distributed leadership may offer a place to start to improve student outcomes, but without more research, any discussion regarding distributed leadership's effect on student learning will remain one of positioning rather than evidence (Harris, 2008). Distributed leadership theory recognizes that many people have the potential to exercise leadership in a school, but the key to success will be the way that the principal develops, organizes, and supports his/her staff to benefit students.

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Appendix A

Pre-Survey Questionnaire

Consent Form

You are invited to participate in this online research survey entitled, "Using Distributed Leadership to Impact Student Achievement." You are included in this survey because you are a public school principal in New Jersey. The number of subjects to be enrolled in the study will be 2,227.

The survey may take approximately 25 minutes to complete. Your participation is voluntary. If you do not wish to participate in this survey, please do not respond. Completing this survey indicates that you are voluntarily giving consent to participate in the survey. The purpose of this research study is to determine the relationship, if any, between distributed leadership and student achievement.

There are no risks or discomforts associated with this survey. There may be no direct benefit to you, however, by participating in this study, you may help us understand the relationship between distributed leadership and student achievement.

Your response will be kept confidential. We will store the data in a secure computer file and the file will be destroyed once the research study has been published. Any part of the research that is published as part of this study will not include your individual information. If you have any questions about the survey, you can contact Dr. Mitani (Dissertation Chair) at mitani@rowan.edu or me at pierroj8@students.rowan.edu. You do not have to give your personal identification.

Completing this survey indicates that you are voluntarily giving consent to participate in the survey.

DIRECTIONS: Please answer each question as accurately as possible by selecting the correct answer or filling in the space provided.

1. What best describes your ethnicity?
    a. White
    b. Black or African American
    c. Hispanic
    d. Asian
    e. American Indian or Alaskan Native
    f. Native Hawaiian or other Pacific Islander
2. What is your gender?
    a. Female
    b. Male
3. What is your highest degree attained?
    a. Master's Degree
    b. Doctorate Degree
    c. Other
4. What is your total time in education?
    a. Less than 2 years
    b. 2-4 years
    c. 5-7 years
    d. More than 7 years

5. Years of administrative experience
    a. Less than 2 years
    b. 2-4 years
    c. 5-7 years
    d. More than 7 years
6. Programmatic Level Please Select grade levels in your building

Pre-K	K
1	2
3	4
5	6
7	8
9	10
11	12

7. Percentage of Chronic Absenteeism
8. Total Student Enrollment
9. Number of School Staff
10. Percentage of Students with Free or Reduced Lunch
11. School Locality
    a. City
    b. Suburb
    c. Town
    d. Rural

a. District Factor Group (Rated A through I)

12. Previous Year's English PARCC Scores NJSLA/PARCC Scores (Percent Meeting or Exceeding Expectation)

13. Previous Year's Math NJSLA/PARCC Scores (Percent Meeting or Exceeding Expectation)

Appendix B

Distributed Leadership Readiness Scale (DLRS)

The following self-evaluation scale has been designed to provide a profile of your district/school's readiness in shared leadership practices. The scale is based on current research on school leadership designed to improve public school capacity to increase student academic achievement (i.e. *Building a Structure for School Leadership*, Richard Elmore, 2000).

The Distributed Leadership Readiness Scale (DLRS) is organized into five key dimensions of instructional leadership: Mission, Vision, and Goals; School Culture; Decision-Making; Evaluation and Professional Development; and Leadership Practices.

Directions:

Participants are encouraged to be as candid as possible when completing the scale. All individual responses will remain strictly confidential. Use the five-point scale from **'Continually' (4)** to **'Rarely/Never' (1)** to indicate how regularly the following statements apply to you and your school. Select 'N/A' if you do not have sufficient information to respond to the statement.

Response Options:

4 = Continually - the particular practice is well-established as a "standard operating procedure" in the school.
3 = Frequently - this practice is often observed in the school.
2 = Sometimes - this practice is intermittently observed in the school.

1 = Rarely/Never - this practice is rarely or never observed in school.

N/A = Insufficient Information - insufficient information to respond to the statement.

	Continually	Frequently	Sometime	Rarely/Never	Insufficient Information
1. The school has clearly written vision and mission statements.	**4**	**3**	**2**	**1**	**N/A**
2. Teachers and administrators understand and support a common mission for the school and can describe it clearly.	**4**	**3**	**2**	**1**	**N/A**
3. If parents are asked to describe the school's mission, most would be able to describe the mission clearly.	**4**	**3**	**2**	**1**	**N/A**
4. If students are asked to describe the school's mission, most would be able to describe the mission generally.	**4**	**3**	**2**	**1**	**N/A**
5. School goals are aligned with its mission statement.	**4**	**3**	**2**	**1**	**N/A**
6. The school uses a school improvement plan as a basis to evaluate the progress it is making in attaining its goals.	**4**	**3**	**2**	**1**	**N/A**
7. Teachers and administrators collectively establish school goals and revise goals annually.	**4**	**3**	**2**	**1**	**N/A**
8. The school's curriculum is aligned with the state's academic standards.	**4**	**3**	**2**	**1**	**N/A**
9. Teachers and administrators have high expectations for students' academic performance.	**4**	**3**	**2**	**1**	**N/A**
10. Teachers and administrators share accountability for students' academic performance.	**4**	**3**	**2**	**1**	**N/A**
11. School and district resources are directed to those areas in which student learning needs to improve most.	**4**	**3**	**2**	**1**	**N/A**

12. The school is a learning community that continually improves its effectiveness, learning from both successes and failures.	**4**	**3**	**2**	**1**	**N/A**
13. There is a high level of mutual respect and trust among the teachers and other professional staff in the school.	**4**	**3**	**2**	**1**	**N/A**
14. There is mutual respect and trust between the school administration and the professional staff.	**4**	**3**	**2**	**1**	**N/A**
15. The school administrator(s) welcome professional staff members input on issues related to curriculum, instruction, and improving student performance.	**4**	**3**	**2**	**1**	**N/A**
16. The school supports using new instructional ideas and innovations.	**4**	**3**	**2**	**1**	**N/A**
17. The school's daily and weekly schedules provide time for teachers to collaborate on instructional issues.	**4**	**3**	**2**	**1**	**N/A**
18. School professionals and parents agree on the most effective roles parents can play as partners in their child's education.	**4**	**3**	**2**	**1**	**N/A**
19. The school clearly communicates the 'chain of contact' between home and school so parents know who to contact when they have questions and concerns.	**4**	**3**	**2**	**1**	**N/A**
20. The school makes available a variety of data (e.g. student performance) for teachers to use to improve student achievement.	**4**	**3**	**2**	**1**	**N/A**
21. Decisions to change curriculum and instructional programs are based on assessment data.	**4**	**3**	**2**	**1**	**N/A**
22. There is a formal structure in place in the school (e.g. curriculum committee) to provide teachers and professional staff opportunities to participate in school-level instructional decision- making.	**4**	**3**	**2**	**1**	**N/A**
23. The principal actively encourages teachers and other staff members to participate in instructional decision-making.	**4**	**3**	**2**	**1**	**N/A**
24. Professional staff members in the school have the responsibility to make decisions that affect meeting school goals.	**4**	**3**	**2**	**1**	**N/A**
25. The school provides teachers with professional development aligned with school's mission and goals.	**4**	**3**	**2**	**1**	**N/A**

26. Administrators participate alongside teachers in the school's professional development activities.	**4**	**3**	**2**	**1**	**N/A**
27. The principal actively participates in his/her own professional development activities to improve leadership in the school.	**4**	**3**	**2**	**1**	**N/A**
28. My supervisor and I jointly develop my annual professional development plan.	**4**	**3**	**2**	**1**	**N/A**
29. My professional development plan includes activities that are based on my individual professional needs and school needs.	**4**	**3**	**2**	**1**	**N/A**
30. Teachers actively participate in instructional decision-making.	**4**	**3**	**2**	**1**	**N/A**
31. Central office and school administrators work together to determine the professional development activities.	**4**	**3**	**2**	**1**	**N/A**
32. The principal is knowledgeable about current instructional issues.	**4**	**3**	**2**	**1**	**N/A**
33. The principal's practices are consistent with his/her words.	**4**	**3**	**2**	**1**	**N/A**
34. Informal school leaders play an important role in the school in improving the performance of professionals and the achievement of students.	**4**	**3**	**2**	**1**	**N/A**
35. The school has expanded its capacity by providing professional staff formal opportunities to take on leadership roles.	**4**	**3**	**2**	**1**	**N/A**
36. Teachers who assume leadership roles in the school have sufficient school time to permit them to make meaningful contributions to the school.	**4**	**3**	**2**	**1**	**N/A**
37. Teachers who assume leadership roles in the school have sufficient resources to be able to make meaningful contributions to the school.	**4**	**3**	**2**	**1**	**N/A**
38. Veteran teachers fill most leadership roles in the school.	**4**	**3**	**2**	**1**	**N/A**
39. New teachers are provided opportunities to fill some school leadership roles.	**4**	**3**	**2**	**1**	**N/A**
40. Teachers are interested in participating in school leadership roles.	**4**	**3**	**2**	**1**	**N/A**