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The Relationship Between Principal Leadership Behavior and Student Achievement in Low Performing Schools

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THE RELATIONSHIP BETWEEN PRINCIPAL LEADERSHIP AND STUDENT ACHIEVEMENT IN LOW PERFORMING SCHOOLS

BY

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Submitted in partial fulfillment of the requirement for the degree of Doctor of Education
Department of Educational Leadership Management and Policy
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submit a copy with your final dissertation to be bound as page number two.
Abstract

This study examined the relationship between principal instructional leadership behaviors and student achievement in the context of low-performing Title I-eligible schools. The intent was to identify specific leadership behaviors that evidenced a relationship to improved student academic achievement in Virginia’s identified priority schools. Results of teacher surveys regarding principal tenure and experience and school size and level were analyzed through the use of descriptive statistics and simple regression models.

While results revealed no significant correlation between principal leadership behaviors and student achievement in English/Reading, a significant positive relationship was found between principal leadership behaviors and mathematics. The strongest relationship between leadership and mathematics achievement appeared to be associated with the principal’s high visibility, which supports the building of relationships among teachers and students. For example, principals would frequently be seen visiting classrooms and attending extra- and co-curricular activities. Additionally, this set of measured leadership behavior included complimenting teachers privately on their efforts or performance.

With regard to predictor variables, schools with smaller numbers of students tended to have greater student achievement in English/Reading and mathematics; schools in which principals had more experience as a principal tended to have greater student achievement in mathematics; schools in which principals were tenured longer tended to have lower student achievement in English/Reading and mathematics; and schools with higher grade levels tended to have greater student performance.
Keywords: Instructional leadership, Principal Leadership, Educational Leadership, Principal
Tenure, Principal Experience, School Size, School Level
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To Dr. Kathleen Smith, your determination and dedication to improving schools in the interest of the Commonwealth’s children inspired me to dedicate the past 20 years of my career to supporting low performing schools in need of improvement.

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To Dr. Wendy Ellis, my professional colleague and friend, your support in the completion of this journey has been a blessing.
Dedication

This dissertation is dedicated to my family, Tracy, Laura, Hannah and McKenzie, for without their tolerance and support I could not have persevered. Although this journey has been diverted numerous times by professional opportunities and callings, the final chapter is complete. All my love to you!

To my late mother and late father, I am forever grateful for the work ethic you modeled and unwavering faith you had in my capabilities. The completion of this doctorate fulfills a promise made to you.
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Chapter 1
INTRODUCTION

Background

The central role principals play at the school level, coupled with federally-imposed national accountability for turning around low-performing schools in the United States, supports further research into identifying specific principal leadership behaviors that influence improved student achievement within the context of low-performing schools. In addition, the evolution of a competitive global economy has brought about an unprecedented focus on educational accountability measured in terms of student achievement. A growing body of research ties educational results to economic growth in developed, as well as developing countries (International Institute for Applied Systems Analysis [IIASA], 2008; Organisation of Economic Co-operation and Development [OECD], 2013). At the turn of the millennium global competitiveness served as the impetus for the United States to implement a system of accountability for educational outcomes based on measures of student achievement. Although the drive for accountability originated at the federal level with revisions to the Elementary and Secondary Education Act of 1965 (ESEA), as amended by No Child Left Behind (NCLB), accountability for student achievement ultimately rests on the shoulders of school principals (No Child Left Behind Act [NCLB], Pub. L. No. 107-110, § 115, Stat. 1425, (2002)).

As noted in recent research, “Ten years ago, school leadership was noticeably absent from most major school reform agendas . . . (Wallace Foundation, 2013, p. 5).” Key studies from the turn of the millennium confirm the direct and indirect impact of leadership on student achievement (Cotton, 2003; Leithwood, Louis, Anderson & Wahlstrom, 2004; Marks & Printy, 2003; Marzano, Waters, & McNulty, 2005). However, research is limited on specific leadership
practices impacting student achievement. While the effects of successful leadership have proven to be greater in the most challenged schools, there has been limited research on the specific behaviors displayed by principals in the context of low-performing schools (Leithwood et al., 2004; Robinson et al., 2008; Hallinger & Chen, 2015).

The United States has long maintained its record as a leading global competitor; however, recent comparisons of educational outcomes tied to economic growth have challenged the ranking of the United States among other emerging economies. Results from the 2012 Programme for International Student Assessment (PISA) from 34 participating countries rank the United States at 27th in mathematics and 17th in reading, far behind Shanghai-China, Singapore, Hong Kong-China, Korea and Japan (OECD, 2013). Education is identified as a fundamental determinant of a country’s aggregate level of economic growth as evidenced by the link of primary and secondary education to employability and income (IIASA, 2008). Whereas a secondary education supports economic growth in developing countries, a tertiary education is a determinant of economic growth in industrialized countries (IIASA, 2008). Evidence of the impact of enhanced workers’ skills on employability is demonstrated by the 2009 OECD countries reporting a 74% employment rate for secondary school graduates in comparison to a 54% employment rate for secondary school dropouts (OECD, 2012, p. 25). Global competition has woven a web of complexities and accountability throughout the world’s educational systems which has manifested itself in increased involvement of the federal government in K-12 education in the United States.

“Turning around the ‘bottom five’ percent of schools is the crucible of education reform. They [the bottom 5% of schools] represent our greatest, clearest need - and therefore a great opportunity to bring about fundamental change,” (Calkins., Guenther, Belfiore & Lash, 2007, p.
In an effort to revitalize its educational system and ensure a quality education that prepares college-and career-ready students, the United States initiated a federally-imposed school-level accountability system, the Elementary and Secondary Education Act (ESEA) of 1965. This program, initiated by Lyndon B. Johnson, has targeted funding for high poverty schools to ensure equal access to a high quality education and to assist in bridging the achievement gap between high poverty and more affluent school populations (ESEA, P.L. 89-10. 79 Stat. 27, (1965)). President George W. Bush signed the No Child Left Behind Act of 2002 (NCLB, 2002), which established federally imposed accountability at the school level to address the achievement gaps that have continued to plague the nation and expand upon the educational services provided to students under ESEA. Under NCLB, states have been required to develop systems to measure the academic progress of all students in meeting challenging state standards. Annual proficiency benchmarks for all students and selected subgroups were set to rise to the goal of 100% proficiency. School-level accountability was manifested in the requirement for annual testing of students in reading and mathematics in grades 3-8 and once in grades 10-12, as well as the requirement for 95 percent student participation rate. Schools and districts were required to make “adequate yearly progress” (AYP) towards the established benchmarks, and to publicly report results for the “all students” group as well as the subgroups: economically disadvantaged students, students with disabilities, English language learners, and major racial and ethnic subgroups.

Schools continue to struggle with meeting federally-imposed NCLB accountability measures. A 2010 study of 2,025 chronically low-performing elementary and middle schools across 10 states revealed only 1 percent had improved enough to exceed the state’s average academic performance after five years of “intervention” by state agencies (Stuit, 2010). Table 1
presents the estimated percentage of Virginia schools not making AYP as compared to the percentage of schools nationwide not making AYP annually over five years (2009-2011). Data from the 2010-2011 school year estimated that 48 percent of schools nationwide had failed to make AYP under NCLB, reflecting an approximate 20 percentile point increase in schools not meeting AYP since 2005-06 (Usher, 2012, p. 6-8). According to then U.S. Secretary of Education, Arne Duncan, 5% of the nation’s schools, or more than 5000 schools, were chronically low-performing and improving low-performing schools have become a national concern with approximately 50 percent of failing schools located in urban areas, one third in rural areas, and the remaining schools in medium-sized towns and suburbs (United States Education Department [USED], speech, June 22, 2009). In 2011, then Secretary of Education Duncan predicted that more than 80% of America’s schools could fail to meet the benchmarks set under NCLB based on 2010-11 assessment benchmarks (USED, speech, March 9, 2011). Usher’s (2012) trend data, as shown in Table 1, supports the rise in concern over the ever increasing number of schools failing to meet the federal benchmarks under NCLB (See Table 1). Based on this trend, state and local educational agencies across the nation were besieged with the task of identifying strategies to recover “failing” schools by increasing student achievement. Although the percentage of Virginia schools not making AYP in 2010 paralleled national results, the number of Virginia schools not making AYP in 2011 (61%) demonstrated a significant increase in comparison to the 2011 national percentage (48%).
Table 1

<table>
<thead>
<tr>
<th>Year</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>29%</td>
<td>28%</td>
<td>35%</td>
<td>33%</td>
<td>39%</td>
<td>48%</td>
</tr>
<tr>
<td>Virginia</td>
<td>23%</td>
<td>26%</td>
<td>25%</td>
<td>28%</td>
<td>39%</td>
<td>61%</td>
</tr>
</tbody>
</table>

Note. Adapted from “AYP Results for 2010-11-November 2012 Update,” by A. Usher, 2012, Center on Education Policy, p. 6-8.

Recognition of and accountability for the school level principal’s impact on student achievement was reflected in the legislative action taken at the state level in Virginia. To comply with the NCLB requirement to implement principal and teacher evaluation systems, Virginia enacted legislation that required 40% of a principal’s evaluation to be based on multiple measures of student performance. The legislation placed a layer of state-level accountability for the school’s student performance on principals and further compelled research that supports principals in understanding the relationship of specific principal leadership behaviors in the context of low-performing schools to improved student achievement. As indicated in the Virginia Board of Education meeting minutes from February 23, 2012 (VDOE, 2012), the board approved the document, Guidelines for Uniform Performance Standards and Evaluation Criteria for Principals, to become effective on July 1, 2013 (Va Code § 22.1-253.13:5, 2013). Virginia State Code reflects the requirement for local division-level adoption of the performance standards for administrators as follows:

B. Each local school board shall adopt for use by the division superintendent clearly defined criteria for a performance evaluation process for principals, assistant principals, and supervisors that are consistent with the performance objectives set forth in the Guidelines for Uniform Performance Standards and Evaluation Criteria for Teachers, Administrators, and Superintendents as provided in
§ 22.1-253.13:5 and that includes, among other things, an assessment of such administrators' skills and knowledge; student academic progress and school gains in student learning; and effectiveness in addressing school safety and enforcing student discipline. The division superintendent shall implement such performance evaluation process in making employment recommendations to the school board pursuant to § 22.1-293.


As Adequate Yearly Progress (AYP) benchmarks approached 100% proficiency for the “All Students” group in 2012, Virginia took advantage of the federal offer for a waiver from certain requirements of NCLB. By 2011-2012, Virginia’s AYP benchmark had risen to 86% proficiency in reading and 85% in mathematics. According to the Virginia Department of Education ESEA Flexibility Request (Virginia Department of Education [VDOE], 2013, p.14), “[o]f Virginia’s 1,839 schools, only 38 percent, or 697 of Virginia’s 1,839 schools, made Adequate Yearly Progress (AYP) based on results from the 2010-2011 assessments, compared to 61 percent of schools that made AYP in the previous year.” Virginia’s ESEA Flexibility Request also provided that the state’s 2011-12 federal accountability benchmarks of 86% in reading and 85% in mathematics surpassed the state’s preexisting state-level accountability system’s benchmarks by 11 percentile points in reading and 15 percentile points in mathematics (VDOE, 2013).
Virginia’s ESEA Flexibility Request (VDOE, 2013) outlines the identification and interventions required for the state’s lowest performing schools. Thirty-six schools ranked in the lowest-performing 5% of Title I schools based on the “All Students” group in reading and mathematics (and graduation rate, if applicable) are identified as priority schools. As evidenced in Figure 1, the priority schools were required to implement a 3-year intervention using one of four intervention models. Based on the model chosen, the school must be closed or the principal must be replaced. Virginia’s early interpretation of this requirement was if a principal has led the school for two years when the school is initially identified as a priority school, he/she may remain as principal on the condition that it is agreed there is evidence of the present principal’s record of success in turnaround.

**Intervention Models**

- **Turnaround Model:** Replace the principal, screen existing school staff, and rehire no more than half the teachers; adopt a new governance structure; and improve the school through curriculum reform, professional development, extending learning time, and other strategies.

- **Restart Model:** Convert a school or close it and re-open it as a charter school or under an education management organization.

- **School Closure:** Close the school and send the students to higher-achieving schools in the division.

- **Transformation Model:** Replace the principal and improve the school through comprehensive curriculum reform, professional development, extending learning time, and other strategies.

*Figure 1. “NCLB Required Intervention Models,” ESEA Flexibility Request: Virginia Department of Education, 2013, p. 73.*

At the turn of the millennium, interest broadened beyond teacher impact on student achievement to include a closer examination of the influence of leadership (Marzano et al., 2005; Hallinger & Heck, 2010; Leithwood and Seashore-Louis, 2012; Robinson et al., 2008) and contextual elements (Fink & Brayman, 2006; Beteille, Kalogrides & Loeb, 2011; Branch,
Hanushek & Rivkin, 2013) on student achievement. Although leadership is identified as a key to improving student achievement, there are contextual variables that also bear consideration, especially in the case of the increasing number of low-performing schools. Principal demographics and school structures have been linked to student achievement, specifically in high poverty and low-performing schools. Principal demographics linked to student achievement include tenure in the building and principal experience. School size (enrollment) and level (elementary, middle, high) are structural variables that have been identified as variables that influence student achievement (Leithwood & Jantzi, 2009; Louis, Leithwood, Wahlstrom & Anderson, 2010; Voight et al., 2013).

While the devastating effects of rapid principal turnover (Fink & Brayman, 2006) are documented, the effects of principal turnover in low-performing schools is markedly greater in comparison to the turnover in higher-performing schools, frequently resulting in the hiring of inexperienced principals. Approximately 25,000 principals leave annually and 50% of new principals quit during their third year (School Leaders Network, 2014, p. 1). A study of the principalship in Miami-Dade County Public Schools from 2003-2009 found that the turnover rate in principals of low performing schools was approximately one third higher when compared to the turnover rate of principals in high performing schools (Beteille et al., 2011, p. 21). Principal tenure is essential when implementing the change required for turning around low-performing schools, as research provides that it takes a principal on average five years to fully implement procedures and policies across the school that will support sustainable improvement (Louis et al., 2010 p. 167). Longer principal tenure relates to higher learning gains in mathematics and reading (Beteille et al., 2011, p. 17-19).
Additionally, while research demonstrates that principals become more effective with experience, less experienced principals more frequently lead in low performing schools (Branch et al., 2013). Not only do principals of high poverty schools have half the years of principal experience as principals in low poverty schools, but principal inexperience also results in lower achievement in mathematics and reading, especially in high poverty low-performing schools (Beteille et al., 2011, p. 17-19; Clark, Martorell & Rockoff, 2009, p. 28). In Miami-Dade County and Texas, low performing schools are more likely to have first-year principal (Horng, Kalogrides & Loeb, 2009; Branch et al., 2013).

School structural variables, level (elementary, middle, high) and size (enrollment), have been found to significantly influence student achievement, especially in low-performing schools (Louis et al., 2010; Gershenson & Langbein, 2015; Lee & Loeb, 2000). In terms of school level, student gaps in knowledge and skills from elementary school grow greater through middle and high school, causing remediation at higher levels to become more complicated and challenging (Kutash, Nico, Gorin, Rahmatullah & Tallant, 2010). As students transition between elementary and middle, rather than continuing in a K-8 school, student achievement decreases in reading and mathematics (Rockoff & Lockwood, 2010). Alspaugh (1998, p. 22) found that double transitions (elementary to middle and middle to high) resulted in greater achievement loss and higher dropout rates than did a single transition (from a K-to-eight school to high school).

School size has been shown to have a significant impact on low socioeconomically disadvantaged students (Gershenson & Langbein, 2015; Lee & Loeb, 2000; Lee & Burkam, 2003). Evidence of the overall impact of school size on student achievement in elementary schools favors smaller schools and smaller to midsize schools at the secondary level (Leithwood
Additionally, a meta-analysis of 57 empirical studies provided that smaller to midsize middle and high schools provided an advantage (Leithwood & Jantzi, 2009).

**Statement of the Problem**

Increased accountability for school performance driven by polices at the national, state and division level has exerted unprecedented pressure on principals, especially in low-performing schools. While research has established the link between principal leadership and learning, a number of variables that impact student achievement and influence the relationship between leadership and student achievement have also been identified. The average effect size between leadership and student achievement of 0.25 equates to a 10 percent increase in student test scores for an average principal who improves across all 21 principal leadership responsibilities by one standard deviation point (Waters, Marzano & McNulty, 2003, p.3). Principal demographics (tenure and experience) and school structures (level and size) have been found to impact student achievement, especially in low-performing schools (Fink & Brayman, 2006; Clark, Martorell & Rockoff, 2009; Leithwood & Jantzi, 2009; Louis et al., 2010).

Understanding the influence of principal leadership behaviors on student achievement, beyond the influence of principal demographics and school structures, will support school leaders in strategically targeting their energies for improved student achievement.

Existing research on the central role principals play in turning around low-performing schools (Leithwood & Jantzi, 2006; Fullan, Hill & Crevola, 2006), coupled with the research evidencing the indirect impact principals have on student achievement, raises the question as to whether there are specific behaviors exhibited by principals that correlate with greater gains in student achievement in the context of low-performing schools. Leadership has proven to be “second only to classroom instruction among all school-related factors that contribute to what
students learn at school," and the effect of successful leadership has been found to be considerably greater in struggling schools (Leithwood et al., 2004, p. 5). While numerous studies have identified a relationship between specific leadership skills and student learning (Hallinger & Heck, 2010, 2012; Marzano et al., 2005; Robinson et al., 2008; Wallace Foundation, 2013), there are limited studies which focus on identifying principal leadership behaviors specifically in the context of low-performing schools (Hallinger & Chen 2015). Based on the increasing number of low-performing schools and the evidence of principal effects on student achievement, there is a need for a deeper understanding of leadership behaviors exhibited by successful principals in low performing schools.

Additionally, the negative impact of principal turnover (Branch et al., 2013; Louis et al., 2010; Beteille et al., 2011) and principal inexperience (Clark, Martorell & Rockoff, 2009; Branch et al., 2013; Louis et al., 2010) on student achievement is well documented. The principal turnover rate was approximately 50% in this study’s population of Virginia’s lowest-performing schools from 2010 and 2013 with 12 of the 26 principals departing based on a review of school-level state report cards. Therefore, principal turnover and principal experience were considered as important variables to be examined.

Research provides that school level (Kutash et al., 2010; Louis et al., 2010; Rockoff & Lockwood, 2010) and school size (Leithwood & Jantzi, 2007; Louis et al., 2010; Voight et al., 2013) play a role in influencing student achievement, and their impact is compounded in low-performing schools. Middle and high schools present greater challenges for improvement in comparison to elementary schools (Louis et al., 2010; Kutash et al., 2010), and student achievement is negatively impacted by school transitions, with a greater impact realized in low socioeconomic populations (Rockoff & Lockwood, 2010, p. 2). This study’s population spread in
level and size supported examination of the influence of school structures on the relationship between leadership behaviors and student achievement.

**Purpose of the Study**

The purpose of this non-experimental quantitative cross-sectional study was to examine the influence of principal leadership behavior on student achievement in low-performing schools. The population for the study was identified as principals of the 36 Virginia schools determined to be the lowest performing 5% of schools under the ESEA, reauthorized by NCLB, 2001, that received School Improvement Grant funding in 2012-2013. The researcher sought to understand the relationship of principal instructional leadership behaviors and improved student achievement within the context of low-performing schools. As Hallinger & Heck (2010, p. 138) note, “[t]he next generation of research will need to focus on contextualizing the types of leadership strategies and practices.”

Additionally, this study sought to explore the influence of principal leadership behaviors on student achievement while controlling for research-based predictive characteristics (tenure and experience) and school structures (level and size).

**Theoretical Framework**

This study is premised on the assumption that the principal’s effect on student achievement is almost entirely indirect (Hallinger, 2008; Day, et al., 2010; Witziers, Bosker & Kurger, 2003). It is not the intent of this study to analyze a myriad of leadership behaviors, school and principal antecedent variables, and mediating factors related to improved student achievement, but rather to explore the influence leadership behaviors have on student achievement over and beyond the variables identified by research that may impact this relationship specifically in low-performing schools. Instructional leadership behaviors will be
measured by the school’s teacher perceptions of the frequency with which the principal exhibited specific instructional leadership behaviors identified by the Principal Instructional Management Rating Scale (PIMRS) measurement tool. Although a variety of measurement tools were used in related studies, the researcher chose to use the PIMRS based on the findings of Robinson et al. (2008) that instructional leadership has 3 to 4 times the impact on student achievement than that of the transformational leadership model and the PIMRS is the most widely used tool to measure instructional leadership. The PIMRS model attends to purposes, people and structure within the larger organization, thereby encompassing many components of distributed, transformational and collaborative leadership. PIMRS components include measures aligned with VDOE’s key trainings provided for the study’s population: climate, goal setting and instructional alignment. As instructional leadership is practice based, rather than theory driven, the PIMRS provided a tool to explore the patterns of instructional leadership in this study.

The central role that the school leader plays in initiating internal changes in schools, combined with the complexity of school turnaround, presents a number of possible confounding variables that potentially influence student achievement. Whereas all schools in this study are Title I or Title I-eligible, poverty is a common variable. The theoretical model depicted in Figure 2 demonstrates this study’s focus on examination of the relationship between the PIMRS 10 functions of principal leadership behavior and student achievement. The model depicts the control of research-based antecedent variables (principal tenure in the school, experience as a principal, school level and school size) while exploring the relationship between principal leadership behaviors and student achievement.
Research Questions

One overarching question and two research questions guided this study. The overarching question focused on the nature of the relationship between principal instructional leadership and student achievement in English/Reading and mathematics in the context of the 36 lowest-performing Title I schools in Virginia. The two research questions delved into the impact of instructional leadership behavior and antecedent variables (principal tenure, experience as a principal, school level and school size) on student achievement in English/Reading and mathematics. They asked how the various functions of principal’s instructional behaviors (Frame School Goals, Communicate School Goals, Supervise/Evaluate Instruction, Coordinate Curriculum, Monitor Student Progress, Protect Instructional Time, Maintain High Visibility,
Provide Teacher Incentives, Promote Professional Development, and Provide Learning Incentives) related to the academic achievement of students in low performing schools in the state of Virginia.

Research Question 1

How does principal leadership behavior influence academic achievement in English/Reading once principal characteristics (tenure and experience) and school structures (level and size) are taken into account in low performing schools in the state of Virginia?

Research Question 2

How does principal leadership behavior influence academic achievement in mathematics once principal characteristics (tenure and experience) and school structures (level and size) are taken into account in low performing schools in the state of Virginia?

Hypothesis

The study’s focus on understanding the relationship between principal leadership and student achievement, taking into account antecedent variables, led to the following null-hypotheses tested:

Null Hypothesis 1: There is no significant relationship between principals’ instructional leadership behaviors and student achievement in English/reading.

Null Hypothesis 2: Null Hypothesis 1: There is no significant relationship between principals’ instructional leadership behaviors and student achievement in mathematics.

Design of Study

This was a quantitative, non-experimental, cross-sectional study that used descriptive and regression statistics to understand the relationship between teacher perceptions of principal leadership behaviors and student achievement. The influence of covariate variables, principal
demographics and school structures on this relationship were examined using a linear hierarchical regression model. The population for this study included the 36 lowest performing schools identified by Virginia as priority schools under the ESEA Flexibility Waiver (2013) for the 2012-2013 school year.

Survey results from the Principal Instructional Management Rating Scale (PIMRS) Teacher Form and Principal Form were provided by the VDOE Office of School Improvement upon request. Part 2 of the PIMRS Teacher Form was used to collect data on teacher perceptions of principal instructional leadership behaviors. The PIMRS Principal Form, Part I, was used to collect a self-reported range of years for principal tenure and principal experience for each principal of the 36 schools. State and school level standards-based assessment results were obtained from the VDOE website.

Significance of Study

Principals in low-performing schools are under extensive pressure from the state, division and community to improve student performance in order to exit the school from federal sanctions in Virginia. Under Virginia’s ESEA Flexibility Waiver (VDOE, 2013), schools were required to meet annual benchmarks for all students and each subgroup that rise to meet the goal of 100% proficiency. Clear evidence on the influence of leadership on student achievement (Waters et al., 2003; Marzano et al., 2005; Leithwood et al., 2004), in combination with knowing the right thing to do (Elmore, 2003) and being specific about a few things are central to leading change (Fullan, 2008) and supporting school improvement. According to Waters et al. (2003), “effective leadership means more than knowing what to do—it’s knowing when, how, and why to do it” (p. 2). Extending research on principal leadership to identify specific leadership behaviors that
support improved student achievement in low-performing schools is essential to effectively and efficiently turning around schools.

With the growing number of low performing schools and increased external pressure for measured student performance accountability comes additional principal school-level responsibilities which include: focus on instructional leadership, data analysis, school improvement initiatives, and compliance monitoring. In the 6-year longitudinal study of the distribution of principal attributes in Miami Dade Schools, Horng et al. (2009) found that about 25% of principals preferred not to work in a failing school in need of improvement. With the demands of leading in low performing schools (increased accountability, additional meetings, time commitment, and reporting requirements), potential school leaders have demonstrated an increasing reluctance to take on the principalship (Darling-Hammond, LaPointe, Meyerson, Orr & Cohen, 2007; Fink & Brayman, 2006). The problem is global, with the increased stress from the expansion of roles and responsibilities (i.e., instructional leader) and the heightened accountability for student performance influencing decisions of aspiring principals to take on the principalship (Pont, Nusche & Moorman, 2008, p. 31). This exacerbates the need for knowledgeable and skilled school leaders that are willing to take on the challenges of low performing schools. A study of principals in the state of Virginia by Dipaolo & Tschannen-Moran (2003) mirrors the results of the international study’s findings - the principalship has become unappealing based on the disproportionality of the salary increase to the increased responsibility and accountability.

The inability to recruit and retain experienced principals for schools serving more poor, minority, and/or low-performing students (Branch et al., 2012; Horng et al., 2009) manifests itself in student achievement dips (Beteille et al., 2011, p. 17-19; Clark et al., 2009, p. 28) which
impedes school turnaround. While principal tenure and experience are positively related to
student learning gains in mathematics and reading (Louis et al., 2010; Beteille et al., 2011), the
greater principal turnover in low-performing schools frequently results in hiring of inexperienced
principals (Beteille et al., 2011; Branch et al., 2013). Research provides that smaller schools have
greater student achievement (Horng, et al., 2009) and provide that elementary schools and
secondary high schools serving diverse or disadvantaged students be limited in size to not more
than 300 and 600 students, respectively (Leithwood & Jantzi, 2007, p. 26). In regards to the
impact of school level on achievement, students transitioning from an elementary to a middle
school experience a sharp drop in achievement which continues to decline during their years
spent in the middle school (Rockoff & Lockwood, 2010) and students transitioning from a
traditional middle school structure to high school had higher dropout rates than those
transitioning from K-8 schools (Alspaugh, 1998).

First, this study furthers the research on the relationship between principal leadership
behavior and student achievement. Specifically, this relationship will be explored through the
context of the state’s lowest performing Title I and Title I eligible schools. Following a synthesis
of research on principal leadership and student achievement, instructional leadership behaviors,
the influence of principal demographics and school structures, the findings in this study will
provide additional data to clarify and support previous research on principal behaviors that
influence student achievement. The findings will provide a focus for practicing school principals,
inform training topics for current and aspiring principals, and identify a skill set for low-
performing school administrative candidates.

Secondly, this study seeks to understand the influence of principal leadership behavior on
student achievement in low-performing schools beyond the effects of principal demographics
(experience as a principal in the school and principal tenure at the school) and school characteristics (level and size). The findings may be used to inform decisions on the placement of principals to achieve a “best fit” between the school and a principal’s instructional leadership skills which will result in increased tenure and improved student achievement. Findings relative to school level and school size will inform district restructuring efforts and capital improvement projects. Identification of specific leadership behaviors, demographics of principals, and school structures that support improved student achievement in low-performing schools may inform state- and division-level professional development and support for principals as well as policy development at the state- and division-level. The results of this study may further define an area of focus, or a specific set of skills, that strengthens postsecondary administrative leadership programs. Findings may also be used as an area of focus by districts for ongoing observation and written feedback to improve instructional leadership skills.

**Limitations of Study**

One limitation of this study was that the PIMRS data collection rested with the school’s principal. Therefore, some principals may not have impressed upon teachers the importance of completing the surveys. Principals who had taken the initiative to implement plans of support for teachers in their buildings may have been concerned with the potential for negative responses. In addition, principals may not have adhered to the VDOE’s request to have surveys completed by those teachers who play an instructional role (i.e., core teachers, media center specialists, Title I interventionists). Teacher participation in completion of surveys may have been impacted.

Additionally, there were limited studies on the United States Department of Education’s implementation of the School Improvement Grant (SIG) program that found improved student achievement with the implementation of SIG-funding models (Dragoset, L., Thomas, J.,
Herrmann, M., Deke, J., James-Burdumy, S. …, 2017). Although the SIG grant program was implemented nationwide, this research study was focused solely on Virginia’s 36 SIG recipient schools. Schools receiving SIG grants included a mix of small and large, rural and urban, and elementary, middle and high school grade spans. The VDOE Office of School Improvement established expectations for and provided principal training outside of the leadership program implemented by the required school identified lead turnaround partners.

Virginia has maintained its own unique state standards and standards-based assessments. At the time of the study the state English/reading standards and related assessments were updated in 2013 to include more rigorous standards and standards-based assessments. Student achievement from the prior year and the current year’s English/reading assessments could not be compared. For consistency, and because mathematics’ standards and related assessments were updated the prior year (2012), predicted mean scale scores were also used as the measure for student achievement. Further study of the SIG grant program as implemented during this study will be precluded by the recent reauthorization of ESEA, the Every Student Succeeds Act (ESSA) of 2015, which extends flexibility and development of sanctions and measures to individual states (ESSA, 2015).

Finally, a number of schools in the population received funding for participation in a teacher pay for performance pilot as Virginia rolled out the teacher evaluation system. Although the PIMRS items associated with Function 7: Provide Teacher Incentives does not pertain solely to monetary rewards, participating teachers in the pay for performance pilot may have interpreted the associated items in relation to monetary incentives.
Delimitations

A delimitation of this study is that the population only included the 36 K-12 schools identified as the lowest-performing 5% schools in one state. Therefore, the results of this study may not be generalized to schools outside of this group. Also, the period of the study was limited to one year as it was the only year that all schools maintained the same principal for the entire school term within a 3-year span. Therefore, a cross-sectional basis for the initial correlation between instructional leadership behavior and student achievement was limited in scope. In addition, the state standards were revised in terms of content and rigor during the study. New English and reading standards were assessed for the first time in 2011-2012 and new mathematics standards were assessed for the first time in 2012-2013. A change in standards and assessments caused longitudinal comparison of scaled scores to be problematic.

Definition of Terms

This section explains the concepts and definitions that will be used in this research study. They are as follows.

1. **Title I** – Title I, Part A (Title I) of the Elementary and Secondary Education Act (ESEA), is federal funding provided to local educational agencies (LEAs) and schools with high numbers or high percentages of children from low-income families to help ensure that all children are supported to meet rigorous state academic standards.

2. **School Improvement Grant (SIG)** - grants awarded by the U.S. Department of Education to state education agencies (SEAs) under Section 1003(g) of the Elementary and Secondary Education Act of 1965, reauthorized by the No Child Left Behind Act of 2002.
3. **School Turnaround** – dramatic, transformative change in the most consistently underperforming schools. In the context of this study the term has been used interchangeably with **school improvement**, as the population for this study is a set of the consistently lowest-performing schools. (Calkins et al., 2007)

4. **Virginia’s ESEA Flexibility Waiver** - waiver from certain requirements of the Elementary and Secondary Education Act of 1965 (ESEA), as amended by the No Child Left Behind Act of 2001 (NCLB) that was granted in June, 2012 by the U.S. Department of Education. Virginia’s ESEA Flexibility Waiver provides detailed information, provided on the VDOE website:


5. **Priority School** – a school identified based on overall student performance in reading and mathematics, including graduation rates in the case of high schools. Five percent of Virginia’s Title I schools (36) are identified as priority schools, as listed on the VDOE website: [http://www.doe.virginia.gov/support/school_improvement/index.shtml](http://www.doe.virginia.gov/support/school_improvement/index.shtml).

6. **Instructional Leadership** – the expertise and influence of the principal that leads to a positive and lasting impact on staff motivation and behavior and student learning (Hallinger & Heck, 1996a). “Refers to those principals who have their major focus on creating a learning climate free of disruption: a system of clear teaching objectives, and higher teacher expectations for teachers and students” (Hattie, J. 2009, p. 83).

7. **Improved Low-performing School** – school that exceeded the predicted increase in reading or mathematics content area scale score in relation to the increase in state scale score for the content area.
Chapter 2

REVIEW OF THE LITERATURE

Introduction

In the current era of standards-based accountability, the pervasive question remains, “What actions can school leaders take that will lead to improved student outcomes?” The debate surrounding the quality of public school education lingers and the pressure on school leaders of low-performing schools to meet federal, state and local accountability benchmarks persists. Over the past 50 years school reform movements and theories of leadership have evolved. There is “[a] compelling, although still modest body of empirical evidence [that] now demonstrates the significant effects of such leadership on school conditions and student learning (Leithwood and Jantzi, 2006, p. 201). As noted by Louis et al., (2010), “we have not found a single case of a school improving its student achievement record in the absence of talented leadership” (p. 9). Consensus is that leadership matters, although both the principal behaviors and degree of the effect are unresolved.

This chapter describes current leadership theories and examines findings from key studies demonstrating a relationship between principal effectiveness and improved student achievement from 1995-2014. In addition, a historical review of school reform movements, including background on the contextual details relative to this study’s priority schools, is provided. The review of literature will provide a theoretical basis for interpretation of results and inform recommendations for policy and further study. The search methods included exploration of educational databases available from and linked to the Seton Hall University library. The search focused on articles pertaining to the emergency of school improvement and instructional leadership theory. Key studies from 2000 – 2015 were the focus for examining current literature on school leadership and student achievement. Database Searches included the following key
words: instructional leadership, school improvement, principal leadership and student achievement, principal effectiveness and leadership in low-performing schools, principal tenure in the building and principal experience, school size, and school transition. In addition, documents relative to the School Improvement Grant and Virginia-specific sanctions were retrieved from searches on the VDOE and United States Department of Education websites.

**Understanding Leadership’s Influence on Student Learning**

The importance of further understanding the influence of principal behaviors, or actions, on student achievement was renewed at the turn of the century. The continued emphasis on school accountability brought about a series of research studies by Hallinger, Hallinger and Heck, Leithwood, Leithwood and Jantzi, Seashore-Louis, Waters, and Marzano focused on identifying leadership actions that support improved student learning. Researchers began examining decades of past studies, many from the effective schools movement era in the 1970’s through 1980’s, with a focus on understanding the link between leadership and improved student achievement. This new era of school reform and school-level accountability impelled researchers to broaden their exploration of variables linked to student achievement, to include the indirect effects of leadership.

Interest in understanding the impact of principal leadership on student achievement evolved from findings identifying the substantial impact that effective classroom teachers have on student achievement. The longitudinal study of Tennessee schools examined the links between student achievement data, assigned teachers, and the school of enrollment which led to the identification of teacher effectiveness as the key determinant of student academic achievement (Sanders & Rivers, 1996). Findings from the study included differences of to 50 percentile points in student achievement resulting from a 3-year teacher sequence; an additive
and cumulative effect of teachers on student achievement; and benefit of lower achieving students first from teacher effectiveness (Sanders, W.L. & Rivers, J.C., 1996, p. 1). A study of New Jersey school districts provided that “moving up one standard deviation in the teacher fixed effect distribution raised both reading and mathematics test scores by approximately .1 standard deviations on a nationally standardized scale” (Rockoff, 2004). Additionally, a study of students in grades K-3 from 79 Tennessee elementary schools, Project STAR, supported the magnitude of teacher impact on achievement with a randomized assignment of teachers. Results indicated that “if teacher effects are normally distributed, the difference in achievement gains between having a 25th percentile teacher (a not so effective teacher) and a 75th percentile teacher (an effective teacher) is over one third of a standard deviation (0.35) in reading and almost half a standard deviation (0.48) in mathematics” (Nye, Konstatopoulos & Hedges (2004), p. 253). The STAR study also upheld prior findings that low SES students benefit the most from an effective teacher (Nye et al., 2004, p 254). Once the direct impact of teacher effectiveness on student achievement was confirmed, educational researchers broadened their scope in search of other variables that may influence student learning. These findings prompted deeper exploration of the potential indirect effects of principal on student achievement mediated through the teacher. A follow up study of 11,600 students randomly assigned to classes by Kreuger (1999) found that students in smaller classes experienced approximately 3 months more schooling than students in regular class sizes with the largest positive effects of class size being for black students, economically disadvantaged students, and boys.

**Theories of Leadership**

Studies during the Effective Schools Movement focused on what principals of effective schools attend to as compared to principals in ineffective schools, and the role of the principal
emerged as an instructional leader and organizational performance manager. In response to the increase in school level accountability to improve student learning at the turn of the century, numerous leadership theories were developed by researchers to provide a model of principal leadership through which the impact of leadership on student achievement could be understood. Four of the most commonly accepted leadership theories include transformational (Leithwood & Jantzi, 1999, 2000, 2006; Ross & Gray, 2006); distributed (Spillane, Halverson & Diamond, 2001, Spillane, Camburn & Pareja, 2004); collaborative (Hallinger & Heck, 2010; Rubin, 2009), and; instructional (Hallinger & Murphy, 1985; Cotton, 2003; Waters & Grubb, 2004; Hallinger & Heck, 1996a, 1996b, 1998).

Transformational Leadership

The transformational leadership model originated during the effective schools movement in the 1970’s and 1980’s. Transformational leadership addresses the social constructs (Yukl, 1999) in which principals are viewed as the primary source of educational expertise (Marks & Printy, 2003) and school restructuring initiatives are based on fostering capacity development and higher levels of personal commitment to organizational goals on the part of leaders’ colleagues (Leithwood & Jantzi, 2000, p. 113). The goal of transformational leadership is to improve organizational performance and affect school conditions by focusing on problem finding, problem solving, and collaboration with stakeholders (Hallinger, 1992, as cited in Marks & Printy, 2003). As noted by Hattie (2009), transformational leaders focus more on the teacher. Leithwood & Jantzi (2000, p. 114) developed a transformational model that includes six dimensions: (1) building school vision and goals; (2) providing intellectual stimulation; (3) offering individualized support; (4) symbolizing professional practices and values; (5) demonstrating high performance expectations; and: (6) developing structures to foster
participation in school decisions. A series of studies by Leithwood & Jantzi (1999, 2000) found small effects of leadership on student engagement were mediated through organizational conditions. The relationship between principal leadership and school conditions explained a total of 27% of variation in those school conditions and only goals and purposes explained a significant portion of variation in student engagement (Leithwood & Jantzi, 2000, p. 697-699).

A large longitudinal study examined the effects of a school-specific transformational leadership model on teachers, classroom practices and gains on student achievement (literacy and numeracy) and found significant effects on teacher’s classroom practices and a significant, but weak relationship between leadership and work setting in numeracy schools (Leithwood & Jantzi, 2006). Ross and Gray (2006) conducted a study of 205 Canadian elementary schools, confirming the small indirect influence of principal leadership on student achievement related to the increase in the transformational leadership practices of collective teacher efficacy and teacher commitment to professional values. According to Ross and Gray (2006), “The impact of indirect leadership on achievement was small: for every 1.0 standard deviation increase in transformational leadership there was a .222 standard deviation increase in student achievement” (p. 809).

**Distributed Leadership**

Distributed leadership was found to be nested within the school rather than only the principal as evidenced in a 4-year longitudinal study of elementary schools in Chicago (Spillane, 2001). Additional research confirmed the importance of examining how the work of managing and leading is distributed over multiple actors; some occupying formally designated leadership positions, others without such formal designations (Spillane et al., 2007). A significant relationship between the indirect effects of total leadership on student learning and achievement
through a path analysis, resulting in the claim that school leadership has a greater influence on schools and pupils when it is widely distributed (Leithwood & Mascall, 2008, p. 34). Total combined leadership (teachers, staff teams, parents, central office staff, students, vice principals and principals) accounted for 27% of the variation in student achievement across schools and high levels of leadership influence were associated with greater student achievement and head teachers were rated as having the greatest influence (both positive and negative) in all schools (Leithwood & Mascall, 2008). In a testing a conceptualization of school leadership as an organizational property and its effect on learning outcome growth models, Heck & Hallinger (2009) found the mutually reinforcing change in distributed leadership and change in academic capacity to have a moderate and significant relationship. A 0.2 effect size in academic capacity was associated with an increase in average school growth rate of 40% (Heck & Hallinger, 2009, p. 681).

**Collaborative Leadership**

Rubin (2002) defines collaborative as “a skillful and mission-oriented facilitation of relevant relationships” (p. 2-3). Rubin (2002) developed an 18-step process, the collaboration life cycle, grounded in of a process of mutual influence. According to Rubin (2002), collaboration is purposeful and a collective endeavor at the juncture of organizing and management. Hallinger and Heck (2010) extend the definition to include student learning as an outcome by defining collaborative leadership as, “… the use of governance structures and organisational processes that empowered staff and students, encouraged broad participation in decision-making, and fostered shared accountability for student learning” (p. 97). Hallinger and Heck’s (2010) findings from a study of U.S. primary schools over four years support the view that collaborative school leadership positively impacts students learning in reading and mathematics.
Instructional Leadership

According to the historical overview provided by Hallinger (2013), instructional leadership is a practice-based rather than theory-driven construct with roots dating back to Lipham (1961) and Bridges (1967). Lipham (1961, as cited in Hallinger, 2013, p. 4) provides that the principal is the school figurehead who most affects the quality of teacher and student performance. During the Effective Schools Movement, Edmonds’ (1982) work asserted the practice of strong instructional leadership through the substantial attention paid to instruction, a pervasive and broad focus on instruction, high expectations for students to meet mastery, and the use of student learning outcomes as a basis for program evaluation. Transformational leadership was found to be necessary but an insufficient condition for instructional leadership. When transformational and shared instructional leadership coexist in an integrated form of leadership, the influence on school performance, measured by the quality of its pedagogy and the achievement of its students, is substantial” (Marks & Printy, 2003). A meta-analysis study of leadership models and student achievement led Robinson et al. (2008) to assert that the greater effect of instructional leadership with average effect size of 0.42 in Dimension 3: Planning, Coordinating and Evaluating Teaching and the Curriculum and an average effect size of 0.84 in the Dimension Four: Promoting and Participating in Teacher Learning and Development, thus demonstrating the importance of leadership’s focus on teaching and learning for the greatest impact on student learning outcomes.

Two conceptual instructional leadership models emerged in the 1980’s. The first model (Figure 3), was presented by Bossert, Dwyer and Lee (1982). Personal characteristics and contextual characteristics influence the principal’s actions which in turn impact the context (school climate and instructional organization) in which student learning takes place.
Hallinger’s Principal Instructional Management Rating Scale (PIMRS) is the second instructional leadership model (Figure 4). The behaviors associated with three overarching dimensions (Defining the School Mission, Managing the Instructional Program and Developing the School Learning Climate) and the ten instructional leadership functions are concerned with the way in which principals shape the conditions that directly impact student learning outcomes (Hallinger and Chen, 2015). This model does not include personal or contextual variables as a component. The PIMRS is used most effectively to analyze the patterns in the instructional leadership of principals and is the most widely used survey instrument in research for assessing instructional leadership.
Based on the continued accountability for student learning and increasing expectations placed on school leaders, the search for a leadership model and effective practices continues. Instructional leadership is more concerned with the teachers’ and school’s impact on student learning and instructional issues, conducting classroom observations, ensuring professional development that enhances student learning, communicating high academic standards, and ensuring all school environments are conducive to learning (Hattie, 2014, p. 37). Although the conceptual framework of Hallinger’s PIMRS focuses on the principal’s role as the instructional leader, many of the activities in the model may be shared, delegated, or distributed (Hallinger, 2003; Marks & Printy, 2003).

**Key 21st Century Leadership Studies**

Research on school improvement has focused on identifying conditions for successfully raising student achievement, however, few studies have focused on specific practices of leaders that impact achievement (Leithwood et al., 2004; Robinson, 2008) in the context of low-performing schools. This is especially true in the case of high needs priority schools as Stuit
(2010) notes, “[b]ecause the successful turnarounds were statistical outliers, it is difficult to accurately determine what factors contributed most to their success” (p. 29). Leithwood & Jantzi (2006) note, “…[T]he potency of leadership for increasing student learning hinges on the specific classroom practices that leaders stimulate, encourage and promote” (p. 223). Leithwood and Louis (2012) state that “Hallinger and Heck (1999) conceptualize instructional leadership to include attention to ‘purposes, people and structure and social systems’” (p. 67). They also note that this theorizes that classroom teaching and learning occur within a larger organizational system. Although principal leadership has been identified as an important influence on improving student learning (Waters et al., 2003; Hallinger & Heck, 2011; Robinson et al., 2008; Leithwood & Louis, 2012), no causal link between improved student learning and specific leadership behaviors has been made. However, the documented connection between leadership and student achievement is a key finding in this era of high stakes accountability.

The millennium began with a flurry of research focused directly on identifying principal leadership’s impact on student achievement. Studies from the previous 40 years provided the basis for multiple meta-analyses. Over the next two decades research abandoned the pursuit for further evidence of a direct effect of leadership on student achievement in favor of understanding the indirect effects. Early studies provided evidence of leadership’s indirect effect on student achievement (Marzano, 2001; Waters et al., 2003; Leithwood et al., 2004). Leadership’s knowledge, support, monitoring and evaluation of the instructional program was recognized as an important practice linked to student achievement (Robinson et al., 2008; Leithwood & Louis, 2012).

Marzano (2001) conducted an analysis of the previous 40 years of research that included studies of school, teacher and student effects on student achievement. A quantitative review of
the research concluded that the effects of schooling accounts for approximately 20 percent of the variance in student achievement across three categories: student background (socioeconomic status (SES), prior knowledge, interest and aptitude) 80.00 percent; school level (opportunity to learn, time, monitoring, pressure to achieve, parental involvement, school climate, leadership and cooperation) 6.6 percent, and; teacher level (instruction, curriculum design and classroom management) 13.34 percent (Marzano, 2001). Witziers’ (2003) early meta-analysis of 37 multinational studies from 1986 – 1996 found negligible (.02) direct effects of principal leadership on student achievement; however, later studies identified a small but significant relationship using models that investigated indirect influences on student achievement (Waters et al., 2003; Marzano et al., 2005; Hallinger, 2008; Hallinger, 2011b; Robinson et al., 2008; Leithwood et al., 2004).

Waters, Marzano and McNulty (2003) analyzed a large sample of quantitative data in an effort to describe a set of knowledge, skills, strategies and tools that practitioners could employ to positively impact student achievement. The meta-analysis of research from the 1970’s through the turn of the millennium that yielded 70 studies involving 2,894 schools, 14,000 teachers and approximately 1.1 million students. The 70 studies identified for the final analysis examined the effects of leadership on student achievement using teacher perceptions as the independent variable and student achievement as the dependent variable. Twenty-one specific leadership responsibilities were identified that correlated with student achievement (See Table 2). Results from the study indicated that improvement in all 21 responsibilities by one standard deviation was found to have an effect size of .25 on student achievement (Waters et al., 2003, p. 3). Marzano, Waters and McNulty (2005) published a school leadership book that expounds upon
the 21 identified leadership responsibilities, delineating responsibilities enacted in first- and second-order change that reiterates the importance of focusing on the right work.
Table 2

**Balanced Leadership: Principal Leadership Responsibilities**

<table>
<thead>
<tr>
<th>Responsibilities</th>
<th>The extent to which the principal . . .</th>
<th>Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culture</td>
<td>Fosters shared beliefs and a sense of community and cooperation</td>
<td>0.29</td>
</tr>
<tr>
<td>Order</td>
<td>Establishes a set of standard operating procedures and routines</td>
<td>0.26</td>
</tr>
<tr>
<td>Discipline</td>
<td>Protects teachers from issues and influences that would detract from their teaching time and focus</td>
<td>0.24</td>
</tr>
<tr>
<td>Resources</td>
<td>Provides teachers with materials and professional development necessary for the successful execution of their jobs</td>
<td>0.26</td>
</tr>
<tr>
<td>Curriculum, instruction and assessment</td>
<td>Is directly involved in the design and implementation of curriculum, instruction and assessment practices</td>
<td>0.16</td>
</tr>
<tr>
<td>Focus</td>
<td>Establishes clear goals and keeps goals in the forefront of the school’s attention</td>
<td>0.24</td>
</tr>
<tr>
<td>Knowledge of curriculum, instruction and assessment</td>
<td>Is knowledgeable about current curriculum, instruction and assessment practices</td>
<td>0.24</td>
</tr>
<tr>
<td>Visibility</td>
<td>Has quality contact and interactions with teachers and students</td>
<td>0.16</td>
</tr>
<tr>
<td>Contingent rewards</td>
<td>Recognizes and rewards individual accomplishments</td>
<td>0.15</td>
</tr>
<tr>
<td>Communication</td>
<td>Establishes strong lines of communication with teachers and among students</td>
<td>0.23</td>
</tr>
<tr>
<td>Outreach</td>
<td>Is an advocate and spokesperson for the school to all stakeholders</td>
<td>0.28</td>
</tr>
<tr>
<td>Input</td>
<td>Involves teachers in the design and implementation of important decisions and policies</td>
<td>0.30</td>
</tr>
<tr>
<td>Affirmation</td>
<td>Recognizes and celebrates school accomplishments and acknowledges failure</td>
<td>0.25</td>
</tr>
<tr>
<td>Relationship</td>
<td>Demonstrates an awareness of the personal aspects of teachers and staff</td>
<td>0.19</td>
</tr>
<tr>
<td>Change agent</td>
<td>Is willing to and actively challenges the status quo</td>
<td>0.30</td>
</tr>
<tr>
<td>Optimizer</td>
<td>Inspires and leads new and challenging innovations</td>
<td>0.20</td>
</tr>
<tr>
<td>Ideals/beliefs</td>
<td>Communicates and operates from strong ideals and beliefs about schooling</td>
<td>0.25</td>
</tr>
<tr>
<td>Monitors/evaluates</td>
<td>Monitors the effectiveness of school practices and their impact on student learning</td>
<td>0.28</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Adapts his or her leadership behavior to the needs of the current situation and is comfortable with dissent</td>
<td>0.22</td>
</tr>
<tr>
<td>Situational awareness</td>
<td>Is aware of the details and undercurrents in the running of the school and uses this information to address current and potential problems</td>
<td>0.33</td>
</tr>
<tr>
<td>Intellectual stimulation</td>
<td>Ensures that faculty and staff are aware of the most current theories and practices and makes the discussion of these a regular aspect of the school’s culture</td>
<td>0.32</td>
</tr>
</tbody>
</table>

Balanced Leadership: What 30 Years of Research Tells Us About the Effect of Leadership on Student Achievement. (Waters et al, 2003, p. 4)

In 2004, The Wallace Foundation published the first in a series of more than 70 published reports investigating effective principal leadership practices through the examination of detailed
case studies and large-scale quantitative analysis conducted by researchers at the University of Minnesota and Toronto. The research focused on furthering the understanding of the impact that effective leaders have on improving student learning. The study’s review of research was aligned with an “organic management” framework based on decades of work on contingency theory by Brian Rowan and various colleagues beginning in the 1990’s.

As a general theory of organizational effectiveness, contingency theory revolves around two basic assumptions: (a) that organizations develop managerial configurations in response to the technical and environmental circumstances they face and (b) that specific managerial configurations are effective only to the extent that they are appropriately matched to these technical and environmental circumstances. (Miller & Rowan, 2006, p 221)

Miller and Rowan (2006, p. 221-222) note that organic forms of management (participatory forms of decision making, supportive forms of leadership, and networks of collegial control) “are more likely to be emerge within, and be effective for, organizations that operate in dynamic environments.” The organic nature of internal and external forces that contribute to the complexity and dynamics researchers encounter when attempting to discern the impact of effective leadership behaviors that impact student achievement in each school’s unique context is evident in Leithwood’s model as seen in Figure 5. Leithwood et al. (2004) note that “[school] leaders play critical roles in identifying and supporting learning, structuring the school settings and mediating the external demands” (p. 18). The study supports the earlier findings in the McREL study that leadership has a small but significant impact on student achievement (Waters et al., 2003).
Leithwood et al. (2004) confirmed the influence of leadership as second only to classroom instruction among all school-related factors that contribute to what students learn at school with the total direct and indirect effects of leadership accounting for about a quarter of total school effects (Hallinger & Heck, 1996; Leithwood & Jantzi, 2000, as cited in Leithwood et al., 2004, p. 5). The review of evidence also found that “effects of leadership are considerably greater in schools that are in more difficult circumstances” (Leithwood et al., 2004, p. 5). The studies identified three sets of basic practices that were found to be at the core of successful
leadership: setting directions, developing people, and redesigning the organization. Setting direction involves identification and articulation of a vision that supports a shared sense of purpose, setting high expectations, monitoring of performance, and effective communication. The practice of setting directions accounted for the largest proportion of a leaders’ impact. Practices associated with developing people deal with building capacity, leaders’ influence of workers’ experiences through their leadership roles, and support for best practices. Redesigning the organization practices include strengthening of the school culture, modification of organization structures and building of collaborative processes. Three conclusions were made from a review of leadership studies linking successful leadership to student achievement (Leithwood et al. 2004, p. 13-14). First, most leaders contribute to student learning indirectly through their influence on other people or features of their organization and their contribution to learning depends on what parts of their organization they choose to spend time and attention on. Secondly, educational leaders need to determine the priorities for attention in their organization. This includes knowing the ideal condition of features associated with the following: teachers’ pedagogical content knowledge and their professional community; class size, student-grouping practices, teachers’ instructional practices and student progress monitoring; school’s mission and goals, teachers’ participation in decision making and relationships with the parents and wider community. school mission, identified goals and pay attention to teachers’ content knowledge, professional community, instructional practices, monitoring of student progress, and participation in decision making. Lastly, there is much more we need to know about the nature and influence of the practices to enable identification of selected features for systematic improvement.
Examination of a large 4-year evaluation of England’s National Literacy and Numeracy Strategies was used to test the effects of transformational leadership on teachers (motivation, capacities, and work settings), classroom practices, and gains in student achievement (Leithwood & Jantzi, 2006). Results indicated that transformational leadership had very strong direct effects on teachers’ work settings (.65 to .79) and motivation (.56 to .67) with weaker but still significant effects on teachers’ capacity (.41 to .58). Leithwood and Jantzi (2006) found school leadership to have an important influence on teachers change in classroom practices, however noted that "there is a significant gulf between changes in the classroom and changes that are ‘changed’ and practices that actually lead to greater pupil learning” (p. 223).

A comprehensive review by Leithwood, Harris and Hopkins (2008) led to a group of key main findings from empirical studies undertaken in the leadership field in international literature. The study identified seven strong claims about successful leadership that support and further elaborate on how leadership impacts student achievement. The claims include:

1. School leadership is second only to classroom teaching as an influence on pupil learning based on qualitative case studies, large scale quantitative studies of overall leadership effects, large scale quantitative studies of specific leadership practices, sources of evidence exploring leadership effects on student engagement, and leadership succession research.

2. Almost all successful leaders draw on the same repertoire of basic leadership practices that include: building vision, setting directions, understanding and developing people, redesigning the organization, and; managing the teaching and learning program.
3. The way in which leaders apply these basic leadership practices – not the practices themselves – demonstrate responsiveness to, rather than dictation by, the contexts in which they work. In early turnaround leaders impart a sense of urgency with clear short-term priorities, restructure communication processes, establish cultural norms, building capacity of people, and use afforded flexibility for staffing, etc. In later stages, successful leaders engage staff in more widespread ownership in revising the school’s direction and develop systems of distributed leadership.

4. School leaders improve teaching and learning indirectly and most powerfully through their influence on staff motivation, commitment and working conditions.

5. School leadership has a greater influence on schools and pupils when it is widely distributed. Overall leadership has significant relationships with staff capacity (.46), motivation and commitment (.25), and working conditions (.55). The indirect effects of total leadership on student achievement accounted for 27% of the variation in student achievement across schools. (Leithwood, et al. 2008, p. 34)

6. Some patterns of distribution are more effective than others. Schools with highest achievement attributed this to influence from all sources of leadership whereas lower performing schools reported low levels of influence from school teams, parents and students. Coordinated parallel
patterns of leadership theoretically are more beneficial (Spillane (2006), as cited in Leithwood, et al. (2008), p. 35).

7. A small handful of personal traits explains a high proportion of the variation in leadership effectiveness. Leaders’ sense of efficacy was supported by a clear focus on student learning and achievement coupled with a commitment to data-based decision-making. The most successful leaders in turnaround schools are open-minded, flexible and ready to learn from others.

Robinson et al. (2008) analyzed a total of 12 multinational published studies by disaggregating composite leadership variables and calculating measures for the effect of leadership practices on student outcomes. Five inductively derived leadership practices emerged from the 199 leadership survey items and constructs (See Table 3). The study concluded that “[t]he more leaders focus their influence, their learning, and their relationships with teachers on the core business of teaching and learning, the greater their likely influence on student outcomes” (Robinson, et al. p. 636). These findings address the lack of focus on instruction in the transformational leadership model.
### Table 3

*The Impact of Five Leadership Dimensions on Student Outcomes (n=199)*

<table>
<thead>
<tr>
<th>Leadership Dimension</th>
<th>Meaning of Dimension</th>
<th>Mean Effect Size</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishing goals and expectations</td>
<td>Includes the setting, communicating, and monitoring of learning goals, standards, and expectations, and the involvement of staff and others in the process so that there is clarity and consensus about goals.</td>
<td>0.42</td>
<td>0.007</td>
</tr>
<tr>
<td>Strategic resourcing</td>
<td>Involves aligning resource selection and allocation to priority teaching goals. Includes provision of appropriate expertise through staff recruitment.</td>
<td>0.31</td>
<td>0.10</td>
</tr>
<tr>
<td>Planning, coordinating, and evaluating teaching and the curriculum</td>
<td>Direct involvement in the support and evaluation of teaching through regular classroom visits and provision of formative and summative feedback to teachers. Direct oversight of curriculum through schoolwide coordination across classes and year levels and alignment to school goals.</td>
<td>0.42</td>
<td>0.06</td>
</tr>
<tr>
<td>Promoting and participating in teacher learning and development</td>
<td>Leadership that not only promotes but directly participates with teacher in formal or informal professional learning.</td>
<td>0.84</td>
<td>0.14</td>
</tr>
<tr>
<td>Ensuring an orderly and supportive environment</td>
<td>Protecting time for teaching and learning by reducing external pressures and interruptions and establishing an orderly and supportive environment both inside and outside classrooms</td>
<td>0.27</td>
<td>0.09</td>
</tr>
</tbody>
</table>


The focus on aspects of the instructional model (planning, coordinating, and evaluating teaching and the curriculum) address the shortcomings of the transformational model and by targeting classroom change for improved achievement. After a decade of study, the Wallace Foundation (2013) identified the five key practices of effective principals that emerged over their decade of study of principal leadership and instruction that emerged as important determinants:

- Shaping a vision of academic success for all students.
- Creating a climate hospitable to education.
- Cultivating leadership in others.
- Improving instruction.
- Managing people, data and processes to foster school improvement.

(Wallace Foundation, 2013, p. 4)

Hallinger and Heck’s (1996b) analysis of 40 studies conducted between 1980 and 1995 exploring the relationship between principal leadership behavior and school effectiveness revealed significant, but small, effects. The underlying theoretical models used in a study make a difference in findings. Model A and A-1 studies resulted in nonexistent, weak, conflict or suspect (validity) results (Figure 6). Studies using B and B-1 models employed stronger research designs and these studies yielded more frequent instances of positive findings. In relation to the B and B-1 findings, Hallinger & Heck (1996b, p. 38) note that context appears to influence the type of leadership that principals exercise. In general, he reported that these models provide that principal leadership that makes a difference is aimed toward influencing internal school processes directly linked to student learning (e.g., academic expectations, school mission, student opportunity to learn, instructional organization, academic learning time). Additionally, in a review of studies presenting positive findings, Hallinger & Heck (1996, p.38) found only one mediating variable that showed up with consistency as a significant factor interacting with principal leadership: school goals. Robinson et al. (2008, p. 639), notes that the indirect effect is depressed because Hallinger used a literature review and discussion of instructional leadership in lieu of calculating an effect size statistic for each of the studies. Finally, in the review of the literature on principal effects, Hallinger (2005) concludes that it is virtually meaningless to study principal leadership without reference to the school context because “the context of the school is a source of constraints, resources, and opportunities that the principal must understand and
address in order to lead” (p.14). Hallinger (2005) further contends that contextual variables of interest in the study of principal leadership include student background, community type, organizational structure, school culture, teacher experience and competence, fiscal resources, school size, and bureaucratic and labor features of the school organization (Bossert et al., 1982; Hallinger & Heck, 1996a, 1996b, as cited in Hallinger, 2005, p. 14).


In the quest to understand the link between leadership and student achievement, current research explores the interplay of leadership with classroom instruction. Heck and Hallinger (2014) conducted a longitudinal study across 60 elementary schools using cross-classification quantitative modeling to analyze the cross-level interactions characteristic of school- and classroom-level practices that contribute to school improvement and student learning. The
study’s key findings support a focus on the school’s instructional program: 1) leadership effects on student learning were fully mediated by the school’s instructional environment; 2) the classroom-related paths examined directly influenced measures of student mathematics achievement; 3) instructionally focused school leadership moderated the effect of individual teachers on student learning, and; 4) school leaders may be able to enhance student outcomes by creating conditions that lead to greater consistency in levels of effectiveness across teachers. The school-level effect size for the school’s instructional environment and mathematics achievement was found to be significant and moderately substantial (SD = 0.28). Students who had two consecutive teachers whose effectiveness was 1-SD above the grand mean increased 0.43 SD in mathematics achievement as compared to students who had successive teachers of average effectiveness. As research continues to explore the “paths” that link leadership to learning, school improvement efforts and principal leadership practices have the potential to become strategically targeted.

**PIMRS: Framing and Communicating School Goals**

The measurement tool, Philip Hallinger’s *Principal Instructional Management Rating Scale* (PIMRS), and related technical documents, including validation studies were reviewed. Relationships between principal behaviors and student achievement are discussed through the lens of the principal behavior measurement tool used for this study, Hallinger’s PIMRS (Hallinger, 1982, 1990). The PIMRS contains 3 dimensions which serve as an umbrella for 10 leadership functions used in this study: Defining the School Mission (Framing the School Goals, Communicating the School Goals), Managing the Instructional Program (Supervise and Evaluate Instruction, Coordinate Curriculum, Monitor Student Progress), and Developing the School Learning Climate (Protect Instructional Time, Maintain High Visibility, Provide Incentives for
Teachers, Promote Professional Development, Provide Incentives for Learning). PIMRS Function 1: Framing the School Goals and Function 2: Communicating the Goals are nested under Dimension 1: Defining the School Mission. In brief, these functions are concerned with the principal’s work with staff to ensure that: a clear mission is established that includes measurable goals; a focus on academic progress pervades; resources are aligned with the goals; and the goals are revisited frequently (Hallinger, 2008). Although establishing goals begins as a first as first order change, as leaders share their ideals and beliefs and align their actions accordingly it becomes a second order change (Waters, 2003). Second order change takes form as resources are strategically aligned to directly support learning of teachers and students (Knapp, Swinnerton, Copland & Monpas-Huber, 2006). With regards to establishing and communicating goals, Robinson (2007) further contends that these goals be specific and embedded in the school’s classroom routines and procedures through a purposeful vision with shared beliefs, thereby imbuing a sense of community that motivates others. The Wallace Foundation (2013) further clarifies that the shared vision for high expectations must be for all students.

The importance of framing and communicating school goals is supported by research. In the review of empirical leadership from 40 studies between 1980 and 1985, school goals showed up with consistency as a significant factor interacting with principal leadership (Hallinger & Heck, 1996b, p.38). Cotton (2003) asserted that principal behaviors associated with having a vision, clear learning goals and high expectations for all students have a significant impact on student achievement. Robinson et al. (2008, p. 659) found the setting, communication, and monitoring of goals and expectations to have an effect size of $r=.42$ on student achievement. Waters et al. (2003) the second order work by principals in relation to establishment of a shared
understanding and purpose with vision as a part of culture evidenced an effect size of $r = .24$ on student achievement.

In terms of Function 1: Framing the School Goals, Houston and Sokolow (2006) provide that it takes an underlying intention and attention that focuses leadership’s energy on the right things such as core values, priorities and alignment of actions. In this era of high stakes accountability tied to student performance standards, “… [I]t is not enough to know what is important, principals must know what is essential” (Waters & Grubb, 2004, p. 41). With regards to the meeting the challenges of turnaround leadership, an underlying desire for improvement and a focus on results and task-oriented actions is needed to accomplish this level of change (Public Impact, 2008). However, setting the goals is just the beginning. A strategic plan must support the goals as “[a]mbitious goals without a well-structured and well supported capacity-building strategy creates an ineffective low-performing school program” (Mintrop & Trujillo, 2005, p. 30; Wahlstrom, York-Barr, 2010).

Key findings associated with Function 1: Framing the School Goals provides evidence of its importance. As noted by Leithwood et al. (2004), setting direction accounts for the largest impact of leadership. In addition, Waters et al. (2003) found the following practices associated with defining the school goals to demonstrate a significant influence on student achievement: holding strong personal beliefs about school, teaching and learning ($r = .25$) and focus on goals and high expectations ($r = .24$). Robinson et al. (2008) identified strategic resourcing relative to the school and teacher’s goals as having a significant effect on student achievement ($r = .31$).

Function 2: Communicating the School Goals connects the stakeholders with the purpose. Although it is the principal’s responsibility to frame and communicate the school goals formally and informally with stakeholder groups, the goals are not created in isolation (Cotton, 2003;
Hallinger, 2008; Leithwood et al., 2004; Robinson et al., 2008; Waters et al., 2003). Cotton (2003) asserted that principal behaviors associated with creating a school culture with shared leadership, decision making, collaboration and risk taking have a significant impact on improving student achievement. Waters et al. (2003) found that communication of and about goals inspires others to push beyond, complying with mandates, and advocating on the school’s behalf to district, parents and community. Rubin (2009, p., 41) proposes that “[c]ollaborative leaders put their targeted goals at the center of their vision and then spend their energy building and managing the relationships they need in order to recruit, develop, and lead the right collection of people towards the goals. Fullan (2008) asserts, first and foremost, that leaders stand for a higher purpose and surround themselves with the right talent. Once the leader has the established the team, the team is empowered by the leader connecting peers with purpose (Fullan, 2008), thereby building a sense of efficacy and influence (Louis et al., 2010). Leithwood et al. (2010) found that turnaround schools must distribute leadership and develop capacity for school improvement beyond the principal to be successful. In terms of the team’s work, Fullan (2008) notes that teams are most effective when three conditions are met, the first being, “when the larger values of the organization and those of individual groups mesh” (p. 45). The first of six secrets, love your employees, is built on strategies that develop a symbolic and human resource frame around the workplace and the value of the employee. Fullan maintains that by building capacity in employees linked to results you will not only help them to find meaning in their work, but also, create conditions for employees and the organization to succeed. Participation and communication amongst all stakeholders is essential in keeping interests and needs in balance.
Research provides evidence of the measurable impact of practices associated with Function 2: Communicating the School Goals and student achievement. Waters et al. (2003) found a relationship with student achievement in open and effective communication ($r = .23$) and opportunities for teams and stakeholders to provide input in decision-making ($r = .30$). Although not addressed by the researcher’s description of the survey instrument’s measure in this function, Waters et al. (2003) found a significant relationship ($r = .28$) for embracing mandated federal/state/local compliance and advocating on behalf of the school to parents and community. The researcher included this leadership practice under the topic of Function 2: Communicating the School Goals based on the premise that the “why” would play a role in driving the school goals and ensuring stakeholder understanding of and buy in with the plan’s implementation. Finally, the researcher included in this function the leadership practice of inspiring others to push beyond (optimizer) as defined by Waters et al. (2003) which was found to have an effect size of $.20$ on student achievement.

**PIMRS: Managing the Instructional Program**

PIMRS Function 3: Supervise and Evaluate Instruction, Function 4: Coordinate the Curriculum and Function 5: Monitor Student Progress comprise the second dimension, Managing the Instructional Program. The work associated with these three functions is concerned with the principal’s role in management of the technical core. Hallinger’s (2008) description of principal behaviors associated with this dimension include direct involvement in: (1) support and evaluation of teaching through oversight of a coordinated curriculum; (2) regular classroom visits and provision of formative and summative feedback; and (3) review of evidence of student learning. Drawing on over a decade of research on school leadership, the Wallace Foundation (2012) identified improving instruction and managing people and data and processes
as two of the five key areas of principals’ responsibility characteristic of effective principals tied to improved student achievement. In lieu of a focus on management, high performing leaders noted that they focused more on instructional leadership by developing teachers and found their most important skill was the ability to support and coach others (Barber & Mourshed, 2007). When comparing Virginia’s low-performing urban high poverty schools with similar high-performing schools, the high-performing schools were able to sustain high levels of student achievement by incorporating the following strategies with the principal’s support: implementation of recommended instructional practices more consistently; use of data to analyze student performance (formative and summative); and adaptation of lesson plans and teaching methods based on data (JLARC, 2014).

Research supports the importance of curriculum coordination and evaluation coupled with the monitoring of student progress. Results of the survey conducted in the McKinsey and Company Report (Barber & Mourshed, 2007) found that the greatest challenge facing high performing leaders in improved schools was to improve teaching and learning. Although it is not the sole responsibility of the principal to manage the instructional program, the principal is responsible for coordinating and controlling the instructional program (Hallinger, Wang & Chen, 2013). When the principal is directly involved in the oversight of curriculum through planning and coordinating the curriculum, coupled with evaluating teaching, Robinson et al. (2008) found there is a .42 correlation with student achievement. Waters et al. (2003) identified a .24 correlation with student achievement and “the extent to which the principal is knowledge about effective curriculum, instruction and assessment practices” (p. 10).

Function 3: Supervise and Evaluate Instruction is associated with the supervision and evaluation of the curriculum. Monitoring of the implemented curriculum at the classroom level,
including supportive feedback to teachers, confirms delivery of the written curriculum. While top strong improvers of educational systems hired more talented teachers, they also developed these teachers and effectively ensured that the best instruction was consistently delivered to each and every student (Barber & Mourshed, 2007). A structure and process for alignment of the curriculum to standards-based assessments is a key leadership practice in relation to managing the technical core (Louis et al., 2010; O’Shea, 2005). In the discussion of the aligned curriculum, three components are included: the written, taught and assessed. Each component is defined by Glatthorn, Carr & Harris (2001):

- The **written** curriculum is found in the documents produced by the state, the school system, the school, and the classroom teacher, specifying what is to be taught. At the district level, the documents usually include a curriculum guide and a scope-and-sequence chart; many school systems make their curriculum documents available through their databases and the Internet. The written curriculum also includes materials developed by classroom teachers.

- The **taught** curriculum is the one that teachers actually deliver. Researchers have pointed out that there is enormous variation in the nature of what is actually taught, despite the superficial appearance of uniformity (Gehrke, Knapp, & Sirotnik, 1992).

- The **tested** curriculum is the one embodied in tests developed by the state, school system, and teachers. The term "test" is used broadly here to include standardized tests, competency tests, and performance assessments.

According to Hallinger (2008), a primary role of the principal is the enactment of behaviors relative to monitoring the delivery of instruction and provision of supportive feedback to teachers. The Teaching and Learning International Survey (TALIS) of teachers in 25 countries
found that “22% of teachers have never received feedback from their principal; over 50% have never received feedback from an external source; yet 79% would find constructive feedback helpful” (OECD, 2013, p. 76). Although all US teachers reported receiving principal feedback from classroom observations for evaluation purposes (OECD, 2013), the quality, or usefulness of the feedback was not addressed in the study. Meaningful and supportive feedback from administrators to teachers supports high quality teaching for successful student learning experiences, which leads to improved student achievement (Hargreaves & Fullan, 2012).

Observations should be focused on providing feedback on the alignment of the written and taught curriculum as reflected in the level of rigor at which students are engaged with the content to support students in constructing meaning (Hattie, 2009). It is of particular importance that feedback is provided to teachers on their efforts (Louis et al., 2010; Wallace, 2013). Developing people has a substantial effect on improved student learning through intellectual stimulation, individualized support and models of best practice (Leithwood, 2004; Louis et al., 2010; Hallinger, 2011a). Principal inspection of classrooms focused on delivery of a curriculum aligned with the assessed standards is essential for low performing schools as leadership focused on classroom practices through hands-on classroom practices and awareness of best practices has been proven to positively impact student achievement (Marzano et al., 2005).

Cotton (2003) asserted that principal behaviors associated with providing instructional leadership that includes discussion of instructional issues, classroom observation, providing feedback have a significant impact on student achievement. Heck (1992, as cited in Robinson et al., 2008) found the mean effect size of a principal’s oversight of teaching and learning in elementary schools to be 1.1 standard deviations, which is far greater than the effect size in high schools (.42). Additionally, a recent study found that giving secondary school teachers frequent
observational feedback based on a reliable observational scoring system resulted in students’ achievement that equated with moving from the 50th to the 59th percentile on Virginia’s state tests (Pianta, 2011). From a teacher’s efficacy perspective, principals spending time in classrooms demonstrates to teachers that the principal understands students and conditions under which they teach (Louis et al., 2010). Using a modified model of teacher efficacy developed by Tschannen-Moran, Hoy and Hoy (1998, as cited in Ebmeier, 2003), Ebmeier’s (2003) additional measures of the indirect effects of active supervision and variables measuring school organizational influences when taken together accounted 47% of the variance in teachers’ personal efficacy.

Function 4: Coordinate the Curriculum deals with the principal’s role in the coordination of the curriculum. Improved schools ensure that there are clear “connections between school learning goals and classroom activity” (Public Impact, 2008, p. 8). Management of the instructional program is a logical focus for principals who are intent on improving student achievement based on the significant direct impact that teacher quality has been found to have on student achievement (Nye et al., 2004; Sanders & Rivers, 1996). The impact of curriculum alignment on student achievement was found to outweigh the effects of student gender, socio-economic status and teacher effect as well as having a greater effect on low achievers than high achievers (Wishneck, 1989 as cited in Squires, 2005, p. 63). Leithwood et al. (2004) confirms the importance of principals’ intimate familiarity with the “technical core” for improving the quality of teaching and learning. Oversight and expectations for a horizontally and vertically aligned coordinated curriculum has been found to be a characteristic of instructionally effective school (Public Impact, 2008; Porter & Smithson, 2001). According to Frontier and Rickabaugh (2014), unless teachers work towards developing curriculum, instruction and assessments that are
explicitly designed to achieve a standard, there will be no translation of the change into classroom instruction. Therefore, “teachers need to be deeply immersed in the process of setting learning expectations for their own students” through identifying standards, analyzing standards, describing student performance, selecting learning activities and evaluating resulting student work (O’Shea, 2005, p. 26).

Instructional leadership is key to improving outcomes as demonstrated by the strong positive and significant correlation (r=.49) found between alignment of instructional content and student gains (Porter et al., 1994 as cited in Squires, 2012). Principal knowledge of curriculum, instruction and assessment is essential, evidenced by the .24 correlation found between principal curricular knowledge and student achievement (Waters et al., 2003). Principals’ direct involvement in the design and implementation of the curriculum through a managerial role (ensuring resources are available and addressing instructional and assessment issues in the classroom) evidenced a correlation of .16 with student achievement (Waters et al., 2003).

Function 5: Monitoring Student Progress is associated with the monitoring of student learning progress through diagnostic, formative, standardized and criterion-based assessments for purposes of program evaluation, modifications to the school’s instructional and design of intervention supports to ensure the school makes progress in established student achievement goals. Cotton (2003) asserted the importance of being accountable for continuous improvements through progress monitoring and use of student progress data to inform programs. The principal’s role in the monitoring of student progress not only supports student data being provided in a timely manner, but also includes support for the data to be analyzed and next steps identified (Leithwood et al., 2004; Knapp et al., 2006; WestEd, 2002). Managing the instructional program must include a process for monitoring progress towards the school’s goals
as well as the impact of the curriculum on student learning (Knapp et al., 2006; Leithwood et al., 2004; WestEd, 2002) and higher performing schools use teacher and student data to make informed decisions (Fullan et al., 2006; Public Impact, 2008). At the classroom level, the use of data is important for monitoring student progress, identifying struggling students, and providing intervention (Duke, 2010). Fullan (2008) notes that teams are most effective “when monitoring mechanisms are in place to detect and address ineffective actions while also identifying and consolidating effective practices” (p. 45). Liker and Meier (2007, as cited in Fullan, 2008, p. 78) describe the importance of delving into results to “identify critical knowledge; transfer knowledge using job instruction; and, verify learning and success,” provides employees a deeper knowledge and understanding of their job.

Research purports a strong correlation between the degree to which students are exposed to tested content and their performance outcomes on the tests of achievement (Winfield, 1993; Stevens, 1993abc as cited in Borman, Cookson, Sadovnik & Spade, 1996 p. 92). Although the direct involvement of the principal in the design of the curriculum and student achievement appears very weak (.16), the extent to which the principal monitors and evaluates the effectiveness of the curriculum, instruction and assessment and student achievement is .28 (Waters et al., 2003).

**PIMRS: School Learning Climate Program**

Five functions comprise the third PIMRS dimension, Developing the School Learning Climate Program: Function 6: Protecting Instructional Time; Function 7: Maintaining High Visibility; Function 8: Providing Teacher Incentives; Function 9: Promoting Professional Development, and; Function 10: Providing Learning Incentives. The functions are concerned with “the creation of an “academic press” through the development of high standards and
expectations and a culture of continuous improvement” (Hallinger, 2008, p. 7). The broader cultural practices associated with this dimension align with the transformational leadership model supported by Leithwood et al. (2004), Marks & Printy (2003) and builds upon relationships within the organization. Hallinger (2003) describes transformational leadership as having more of a focus on involving stakeholders in problem-finding and problem-solving with the ultimate purpose of improving organizational performance rather than on instruction. Principals seek to foster a transformational climate that supports academic success for all students, celebrates successes, and cultivates leadership in others. Hoy (2012) purports “academic optimism (a latent construct consisting of academic optimism, collective trust in parents and students, and collective efficacy) as strong a predictor of achievement as socio-economic status.” Principal behaviors associated with Functions 6-10 include:

- **Protecting Instructional Time**: Principal ensures school-wide policies provide uninterrupted blocks of classroom learning time.
- **Visibility**: Principal maintains high visibility around campus and in classrooms, ensuring ongoing interaction between principals and students, as well as teachers.
- **Incentives to Improve Teaching**: Principals use formal and informal ways to provide praise or public recognition to teachers when deserved.
- **Promoting Instructional Improvement and Professional Development**: Principal supports teachers in improving instruction by ensuring professional development opportunities are aligned with school goals or teacher needs.
- **Providing Incentives for Learning**: Principal creates a learning climate in which academic achievement is valued by students and there are frequent opportunities for recognition of student achievement and improvement through classroom and whole school events.
Research provides a solid foundation in support of principal actions related to the five Functions subsumed in Dimension 3. Hoy (2010) notes, academic optimism is a people-oriented endeavor requiring building administrators to establish a healthy school where instructional integrity, integrated leadership, high morale, and the general press for high academic standards are at the forefront. Leadership practices associated with strengthening the school culture by ensuring structures support collaborative processes is identified as one of five key principal responsibilities through the recent decade of studies (Wallace Foundation, 2012; Louis et al., 2010).

Relative to Function 6: Protecting Instructional Time, Robinson et al. (2008) found leadership practices associated with ensuring an orderly supportive environment to have an effect size of ($r=.27$) on student achievement. Waters et al. (2003) identified a .26 correlation between student achievement and the extent to which the principal provides and enforces clear structures, rules and procedures for student and staff. Additionally, Waters et al. (2003) found a .24 correlation between student achievement and the extent to which principals protected instructional time from interruptions and protected/sheltered teachers from distractions. The importance of a collaborative culture is evidenced by a .29 correlation found between student achievement and the extent to which the principal promotes cooperation and cohesion among staff (Waters et al., 2003). In terms of Function 7: Maintaining Visibility, the principal’s visibility, quality contact and interactions with teachers and students, was found to have a .16 correlation with student achievement (Waters et al., 2003). Research findings associated with Function 8: Promote Professional Development evidenced a correlation between student achievement and the intellectual stimulation that engages staff in study of effective practice,
current research and theory to be .32 (Waters et al., 2003). Additionally, Robinson et al. (2008) identified a .84 correlation between leadership that not only promotes, but directly participates in teacher informal and formal professional learning and student achievement. Additionally, principals in Virginia’s higher performing urban high poverty schools actively promoted recommended instructional strategies and provided ongoing professional development through a professional learning community model in contrast to principals of low-performing urban high poverty schools (JLARC, 2014). Finally, with regard to Functions 8 and 10, the systemic and fair recognition and celebration of accomplishments for teachers and students was found to have a .25 correlation with student achievement (Waters et al., 2003).

Emergence of School Improvement

School reform in the United States was initiated in the mid 1960’s by the passing of the ESEA Act of 1965 and the publishing of Coleman’s (1966) *Equality of Educational Opportunity* study (more commonly known as the Coleman Report). The Elementary and Secondary Education Act (ESEA) of 1965 provided targeted funding for high poverty schools to ensure equal access to a high quality education and to assist in bridging the achievement gap between high poverty and more affluent school populations (ESEA, P.L. 89-10. 79 Stat. 27, 1965). Commissioned by the United States Department of Health, Education, and Welfare in 1966 to assess the availability of equal educational opportunities to children of different race, color, religion, and national origin, the Coleman Report was conducted in response to provisions of the Civil Rights Act of 1964 that required a survey to be conducted within two years of the enactment of this title. The report examined data from over 600,000 students and 60,000 educators “concerning the lack of availability of equal educational opportunities for individuals by reason of race, color, religion, or national origin in public education at all levels” (Coleman,
Greater student achievement was found to be most influenced by 2 factors: teacher quality and educational aspirations of students in the school. The report also asserted that the average minority student is more affected by the quality of his school facilities, the curriculum, and the teachers than the average white student.

A stream of research and school improvement guidance was generated in response to the Coleman Report through the Effective Schools Movement of the 1970’s and 1980’s. An early study of four inner city schools performing at or above the national norm with reading achievement identified “strong leadership,” “high expectations” for students, and an intense focus on monitoring progress towards acquisition of early reading skills and achievement as key levers (Weber, 1971). Leadership was found to play an integral role in a longitudinal study of improving and declining elementary schools in Michigan. Brookover and Lezotte’s (1979) synthesis of the principal’s leadership role in the improving schools included: a) principal is more likely to be an instructional leader, be assertive in the instructional leadership role, more of a disciplinarian, and assumes responsibility for the evaluation of achievement basic objectives; b) principals and teachers place emphasis on and assume responsibility for reading and mathematics objectives and meeting goals; c) principals and teachers hold the belief that all students can master basic objectives; d) principals and teachers hold high expectations for students in mastery of reading and mathematics objectives, and e) staff devote greater time towards achieving reading and mathematics objectives. Their most pervasive finding was the one concerning teachers’ and principals’ attitudes toward student achievement.

The elusive search for characteristics that distinguish principals of effective schools from those in ineffective schools, regardless of family background, continued into the next decade. Edmonds (1982) expressed two concerns with the research that had been conducted: 1) research
was still unsure whether the identified leadership characteristics were causes of instructional 
effectives, and 2) the characteristics had yet to be ranked in terms of effectiveness.

Characteristics of effective schools that had emerged through school improvement research 
included: a) the leadership of the principal notable for substantial attention to the quality of 
instruction; b) a pervasive and broadly understood instructional focus; c) an orderly, safe climate 
conducive to teaching and learning; d) teacher behaviors that convey the expectation that all 
students are expected to obtain at least minimum mastery, and e) the use of measures of pupil 
achievement as the basis for program evaluation.

Lezotte (1991) revisited the correlates of effective schools and further elaborated the on 
seven correlates: 1) instructional leadership, 2) clear and focused mission, 3) safe and orderly 
environment, 4) climate of high expectations, 5) frequent monitoring of student expectations, 6) 
positive home-school relations, and 7) opportunity to learn and student time on task. This second 
generation of correlates expanded upon the first as follows. Leadership is distributed among 
teachers and the staff who model collaborative behaviors through teamwork. The principal’s role 
morphs into a “leader of leaders.” High expectations are broadened to include implementation of 
strategies (i.e., re-teaching and regrouping) to support students to achieve mastery. Leaders 
prioritize, deciding what is most important to dedicate time to. Student learning is monitored 
more frequently through “authentic assessments.” Parents and teachers will engage in an 
authentic partnership. In a report to the Institute of Education, University of London, a team of 
researchers summarized school effectiveness research and identified a list and descriptions of 11 
key characteristics of effective schools as shown in Table 4. Factors were derived from studies of 
the characteristics of small numbers of outlier schools and findings should not be applied without 
reference to context (Sammons, P., Hillman, J. and Mortimore, P., 1995). Research conducted
during the Effective Schools Movement provided the foundation that informed and guided school improvement efforts moving forward.

Table 4

*Eleven Factors for Effective Schools*

| Eleven Factors for Effective Schools |  
|-------------------------------------|---|
| 1. Professional leadership | Firm and purposeful; A participative approach; The leading professional |
| 2. Shared vision and goals | Unity of purpose; Consistency of practice; Collegiality and collaboration |
| 3. A learning environment | An orderly atmosphere; An attractive working environment |
| 4. Concentration on teaching and learning | Maximisation of learning time; Academic emphasis; Focus on achievement |
| 5. Purposeful teaching | Efficient organization; Clarity of purpose; Structured lessons; Adaptive practice |
| 6. High expectations | High expectations all round; Communicating expectations; Providing intellectual challenge |
| 7. Positive reinforcement | Clear and fair discipline; Feedback |
| 8. Monitoring progress | Monitoring pupil performance; Evaluating school performance |
| 9. Pupil rights and responsibilities | Raising pupil self-esteem; Positions of responsibility; Control of work |
| 10. Home-school partnership | Parental involvement in their children’s learning |
| 11. A learning organization | School-based professional development |


**Federal Policy Impacting Low-Performing Schools**

The United States’ intensified focus on global competition, coupled with the drop in international standings on student achievement (OECD, 2012; OECD, 2013), brought about an unprecedented stream of federal funding for the lowest-performing schools. The United States Education Department’s (USED) sizeable School Improvement Grant (SIG) program was paired with federally-imposed accountability to improve the nation’s low-performing schools (USED, 2010). Replacement of the principal was a required component of intervention models based on the current principal’s tenure and school’s performance. Additionally, the NCLB waiver Virginia
received required the use of academic progress as 40% of a principal's annual evaluation. Researchers turned their focus to the role of the building principal in an effort to understand the relationship between principal leadership and improved student achievement.

The specific context of this study is revealed through an examination of federal and state implementation of the School Improvement Grant program requirements which regulates the high stakes federal accountability under which principals of low-performing schools in this study labor. The United States Department of Education (USDE) and the VDOE documents relative to the Elementary and Secondary Education Act of 1965 (ESEA), as reauthorized by the No Child Left Behind Act of 2002 (NCLB); School Improvement Grants (SIG), authorized under section 1003(g) of ESEA (2009), and; Virginia’s Elementary and Secondary Act Flexibility Waiver (2013). Through the review of federally-imposed and state-implemented accountability, aspects of the accountability system under which principals in low-performing schools labor to improve student achievement and turnaround schools is described.

NCLB was the U.S. Department of Education's initial "initiative to turn around low-performing schools [and] to mobilize resources to improve the quality of school leadership and the teaching force and help low-performing schools implement coordinated, research-based reforms to improve student achievement" (U.S. Department of Education. (2001) Washington, DC: Office of Elementary and Secondary Education, 2001, p. 8. School Improvement report: Executive order on actions for turning around low-performing schools.). Under the NCLB accountability requirements, states were required to:

1. Serve the lowest-achieving schools;
2. Demonstrate the greatest need for such funds; and
(3) Demonstrate the strongest commitment to ensuring that such funds are used to enable the lowest-achieving schools to meet the progress goals in school improvement plans.
United States Department of Education. (2009)

In addition to the NCLB mandate for the implementation of an intervention model and competitive grants that secure substantial funding, the six components of the Elements of Reform, as provided in Figure 7, were to be addressed at the school level.
Virginia committed to identifying and providing support to the state’s lowest-performing schools. The state identified any school meeting one or more of the criteria in Figure 8 as a priority school. Based on the 723 schools identified as Title I in 2011-2012, Virginia identified the number of schools equal to five percent of the state’s Title I schools, or 36 schools, as priority schools for school year 2012-2013 (Figure 8).

Identification of Priority Schools

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Schools receiving School Improvement Grant (SIG) funds under Section 1003(g) of ESEA in Federal Fiscal Year 2009 (Cohort I) or 2010 (Cohort II) and identified and served as a Tier I or Tier II school</td>
</tr>
<tr>
<td>B</td>
<td>Title I high schools with a federal graduation indicator* of 60 percent or less for two or more of the most recent consecutive years</td>
</tr>
<tr>
<td>C</td>
<td>Title I schools based on the “all students” performance in reading and/or mathematics performance on federal AMOs (See additional notes below.)</td>
</tr>
<tr>
<td>D</td>
<td>Title I schools failing to meet the 95 percent participation rate in reading and/or mathematics for three consecutive years</td>
</tr>
</tbody>
</table>

Steps in Methodology

<table>
<thead>
<tr>
<th>Steps in Methodology</th>
<th>Number of Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identify the number of Title I schools in the state in 2011-2012.</td>
<td>732</td>
</tr>
<tr>
<td>2. Identify the number of schools that must be identified as priority schools (a number equal to five percent of Title I schools).</td>
<td>36</td>
</tr>
<tr>
<td>3. Identify the schools currently served as Cohort I and II Tier I or Tier II SIG schools. (Criterion A)</td>
<td>26</td>
</tr>
<tr>
<td>4. Identify the schools that are Title I-participating with an FGI of less than 60 percent over the past two consecutive years. (Criterion B)</td>
<td>1</td>
</tr>
<tr>
<td>5. Identify the number of schools that are among the lowest-achieving five percent of Title I schools based on the performance of all students in reading and/or mathematics on federal AMOs (Criterion C)</td>
<td>9</td>
</tr>
<tr>
<td>6. Identify the number of schools that are Title I schools failing to meet the 95 percent participation rate in reading and/or mathematics for three consecutive years (Criterion D)</td>
<td>0</td>
</tr>
<tr>
<td>Total Number of Priority Schools Identified</td>
<td>36</td>
</tr>
</tbody>
</table>

Figure 8. Identification of Priority Schools. *The ESEA federal graduation indicator Recognizes only Standard and Advanced Studies diplomas. ESEA Flexibility Request, Virginia Department of Education, February 23, 2012

Effects of NCLB School Improvement Policies

As federal Annual Measurable Objectives in reading and mathematics increased towards the required 100% proficiency rate for all subgroups of students, the struggle for schools nationwide to meet this objective became a challenge. According to a nationwide collection of data by the Center for Education Policy, the percent of schools nationwide that did not make AYP in 2005-06 increased from 23% to 48% by 2010-2011 (Usher et al., 2012, p. 7). In a study
of 1,768 low-performing school across 10 states in 2003-04, “only twenty-five (1.4 percent) raised their average 2007-08 and 2008-09 proficiency rates above their states’ 50th percentiles, while only one of the 257 (0.4 percent) originally low-performing charter schools met the turnaround criteria” (Stuit, 2010, p. 29). The percentage of schools that did not make AYP in Virginia more than doubled over a five-year span, increasing from 23% in 2005-06 to 61% in 2010-11 (Usher et al., 2012, p. 8). After almost a decade of NCLB implementation and accountability, Virginia’s progress in improving schools mirrored that of the nation. According to the VDOE (2009), 6 out of 10 schools made AYP under NCLB based 2009-10 accountability measures. Eighty-nine Virginia schools made AYP through “safe harbor,” a provision that allows a school to meet AYP by making a 10 percent reduction in the failure rate. For a Virginia school, or division, to have made AYP based on 2010-2011 performance measures on assessments, 86 percent of students must have demonstrated proficiency in reading, and 85 percent of students must have demonstrated proficiency in mathematics. According to Virginia’s ESEA Flexibility Waiver (Rev. 2013, p. 14), the number of schools that made Adequate Yearly Progress (AYP) based on 2010-2011 assessment results was 697, a decrease from 1,121 schools making AYP in the previous year (2009-2010).

Along with the unprecedented amounts of School Improvement Grant (SIG) funding came significant expectations for improvement of teaching and learning. These expectations were clearly defined in a June 2009 speech by the United States Secretary of Education, Arne Duncan, “States and districts have a legal obligation to hold administrators and teachers accountable, demand change and, where necessary, compel it. They have a moral obligation to do the right thing for those children—no matter how painful and unpleasant.” Virginia was awarded $59.8 million of the nation’s $3.5 billion in 2010 from the 2009 federal budget and
American Recovery and Reinvestment Act funding to support the turnaround of its persistently lowest achieving schools beginning in 2010-2011 (Ed.Gov website, accessed December 12, 2014). The funding targeted persistently lowest achieving schools through a competitive application process, earmarked for schools identified as “persistently low-achieving” under the Obama administration’s SIG 2009 initiative and provided a maximum of $2,000,000 in funding for an individual school (Federal Register/ Vol. 75, No. 208 / Thursday, October 28, 2010 / Notices).

In 2011, the number of schools failing to meet accountability measures continued to escalate contributing to only 128 of the 132 school districts in Virginia filing to make AYP (VDOE, 2011) and the need for a new federal accountability model was voiced by the State Superintendent. As the annual measurable objectives for AYP steadily approached 100 percent and more schools, as well as divisions potentially faced a status of “failing,” the United States Department of Education (USED) offered each state educational agency (SEA) the opportunity to request flexibility on behalf of the state educational agency (SEA), its local educational agencies (LEAs), and its schools, in order to strengthen focus on improving student learning and increasing the quality of instruction.

In 2012, Virginia took advantage of this voluntary opportunity to provide the SEA and LEAs with flexibility regarding specific requirements of the Elementary and Secondary (positive and negative) exchange for rigorous and comprehensive state-developed plans designed to improve educational outcomes for all students, close achievement gaps, increase equity, and improve the quality of instruction. The Elementary and Secondary Education Act of 1965 (ESEA) Flexibility Waiver is intended to waive, with certain exceptions, any statutory or regulatory requirement of the ESEA, however certain conditions must be met. Under this
flexibility, the USED granted a waiver to the VDOE through the 2013-2014 school year, which can be extended annually. Under Virginia’s ESEA Flexibility waiver, the provision is for all subgroups to meet 78 percent proficiency in reading and 73 percent proficiency in mathematics with 2016-2017 assessments. In order to receive a waiver under NCLB, Virginia had to ensure that 1) college- and career-ready standards and assessments were in place to measure student achievement and growth; 2) a differentiated accountability system was established that recognized high-achieving, high progress schools (reward schools) and provided supports to chronically low-achieving schools (priority and focus schools); and 3) divisions implemented a teacher and principal evaluation and support systems to improve instruction.

Accountability for student performance at the school level was amplified by Virginia’s adoption of a principal evaluation system as a requirement for the ESEA Flexibility waiver. Recognition of and accountability for the principal’s indirect influence on student achievement are reflected in action taken on the State level. As indicated in the Virginia State Board of Education meeting minutes from February 23, 2012, the board approved the document *Guidelines for Uniform Performance Standards and Evaluation Criteria for Principals*, to become effective on July 1, 2013. These guidelines set forth the requirement that 40% of the principal’s annual evaluation be based upon multiple measures of student performance. Virginia State Code reflects the requirement for local adoption of the performance standards for administrators.

Under the *ESEA* flexibility waiver (2013), a school ranked in the lowest-performing 5% of Virginia’s Title I schools based on the “All Students” group in reading and mathematics (and graduation rate, if applicable) is identified as priority school. A priority school is required to implement a 3-year intervention model. As evidenced in Section 2.D.iii of the *ESEA* Flexibility
Waiver request a local educational agency (LEA) with priority schools must implement one of four intervention models. All four models have a significant impact on the position of the principal. Either the school must be closed or the principal must be replaced if they have served as principal of the school for two previous years. Required implementation of a turnaround model and replacement of the principal include meaningful interventions designed to improve the academic achievement of students in priority schools that are aligned with all of the following “turnaround principles” and selected with family and community input: providing strong leadership by: (1) reviewing the performance of the current principal; (2) either replacing the principal if such a change is necessary to ensure strong and effective leadership, or demonstrating to the SEA that the current principal has a track record in improving achievement and has the ability to lead the turnaround effort; and (3) providing the principal with operational flexibility in the areas of scheduling, staff, curriculum, and budget; ensuring that teachers are effective and able (Virginia’s ESEA Flexibility Request, 2013, page 62).
**Federal School Improvement Model**

Mass Insight’s readiness model (Figure 9) provided a foundation for Virginia’s original School Improvement Application and the model has continued as a component of the ESEA Flexibility Waiver (2013). The model combines research on effective schools and an analysis of high-performing, high-poverty schools. Nine interlocking elements fall under three overarching dimensions: readiness to learn, readiness to act and readiness to teach. The principal’s role in the model is delineated in the readiness to act component, connected with resource authority, resource ingenuity and agility in the face of turbulence.

*Figure 9. High-Performance, High-Poverty Education: The HPHP Readiness Model. Mass Insight, 2007*

**Leadership and School Improvement**

Turnaround is a complex process as school improvement requires systems and processes that are aligned with a school improvement plan (Barber & Mourshed, 2007). Successful organizational change involves changes in the structure and culture of working conditions (Fullan, 2007). Not only is this work challenging, it results in some tough individual and
organizational learning. As Fullan (2008) notes, “learning is the work” and for school leaders it is job-embedded. Continuous reflection is required to discern the lessons to be learned and inform the change in order to create a better leader or organization (Heifitz, Grashow & Linsky, 2009). “[T]he essential problem in our schools isn’t children learning; it is adult learning” (Payne & Kaba, 2008, p. 179) that impedes leaders in the areas of social infrastructure, building-level politics, instructional capacity, environmental turbulence and structure for support. Development of cultural capacity must serve as the basis for turnaround work. The “…principal is crucial for success” and exhibits the following characteristics: an “inclusive, facilitative orientation”; an “institutional focus on student learning”; “efficient management”; and “combined pressure and support” (Bryk et al., 1998, as cited by Fullan, 2000, p. 17).

Leadership is second only to teaching in its impact on student achievement (Leithwood et al., 2004) and plays a central role in initiating internal changes in schools, providing direction and support (Fullan, 2001; Public Impact, 2008). Mintzberg (as cited in Fullan, 2008, p. 128) describes an effective leader as one who “…inspires more than empowers; connects more than controls; demonstrates more than decides.” Although the principles may seem intuitive and simple, the task of implementing them consciously and consistently becomes the real work. “Leadership is a largely uncontested linchpin, in both accounting for an organization’s failure and returning the organization to a stable state,” (Kowal & Hassel, 2005 as cited in Leithwood et al., 2010).

In this age of accountability and complexity, identification of school leadership components that have the greatest potential effect for raising student achievement has become essential. Not only are today’s leaders forced to grapple with accountability challenges on a personal level, but they also face accountability at the school, district, state and national level.
Principals who haven't been comfortable supervising traditional instruction are being asked to lead the implementation of a variety of new, often more complicated, instructional initiatives (Payne & Kaba, 2007). An examination of low-performing schools in the United States, Canada and England found turnaround transpire through three overlapping stages: 1) stopping decline and creating conditions for improvement early on, 2) ensuring survival and realizing early performance improvement and 3) reaching satisfactory performance, but aspiring to much more (Leithwood, Harris & Strauss, 2010). Successful turnaround principals set the turnaround agendas, lead teachers, involve the community and build general capacity of the organization (Murphy and Meyer, 2008). Fullan (2011) purports that the more effective drivers for leading reform are those that systemically change the culture: “capacity building, group work, instruction and systemic solutions” (p. 5).

Sokolow (2010) differentiates between enlightened leaders and leaders - “It [enlightened leadership] is doing the right things in the right way at the right time for the right reasons.” Additionally, Fullan (2011) maintains the importance of world class standards; teacher and leadership effectiveness; aligned assessments and accountability; and systemic solutions. Leaders today must not only develop basic skills of leadership that surround technical problem/solutions, but they must also become adept with a wide range of skills that inspire and engage themselves and the people of their organization within a state of disequilibrium and multiple layers of accountability. Managers know how to do things right (technical), but good leaders know how to do the right thing (adaptive) (Heifitz et al., 2009). In a longitudinal study of 200 elementary schools, Heck & Hallinger (2010) confirmed the need for principals to adapt leadership practices to the particular school.
Through building the capacity of teachers and leaders, promoting social capital through collective group work, and using formative assessment to inform instruction and provide for external accountability, Fullan (2011) believes a reform effort becomes a more systemic, and less fragmented, process. Successful implementation of this theoretical underpinning is reflected in North Carolina’s most improved turnaround schools. Tompson, Brown, Townsend, Henry & Fortner (2011) found that the most improved schools (20 points or more) had a new principal appointed that “sparked a series of changes in key areas of school operation, including (1) the commitment, climate, and culture affecting student learning, (2) the knowledge and skills that school leaders, teachers, and other staff bring to their jobs, (3) the structures and processes that support instruction within the school, and (4) the strength of linkages between the school and both the district central office and the community served by the school” (p. 79). The sense of trust, framing of measurable goals, focus on instruction and high expectations resulted in a systemic reform effort of capacity building and culture change that spilled over to students.

Principal Tenure and Experience

The impact of the principal on student achievement in the most challenging schools – specifically, high-poverty and high minority schools as well as low-performing schools – is greater than that in low-poverty schools (Branch et al., 2012; Beteille et al., 2011). While the average length of principal tenure in average schools is three to four years (Louis et al., 2010), principal turnover in low-performing schools in Miami-Dade County Public Schools between 2003-2009 was twice (30%) that of principal turnover in high performing schools (15%) (Horng et al., 2009). Principal turnover has a negative effect on initiatives related to improving student achievement (Fink & Brayman, 2006), accounting for up to 24% of the variance in student achievement (Louis et al., 2010). Stability of leadership for four or more years is critical to fully
developing school-level processes, as the stabilization of and improvement in teaching staff and the full implementation of policies and practices to increase student achievement are purported to take approximately five years (Louis et al., 2010). Heck & Hallinger (2009) equate greater capacity building and a significantly stronger perception of academic capacity which result in increased achievement with continued tenure (p. 681). The greatest impact of turnover occurs immediately after turnover with lower achievement in mathematics characteristic of schools with new principals (Beteille et al., 2011). Turnover in the principalship often results in teacher turnover, which has significant negative effects on student achievement in reading and math, especially in low performing schools (Ronfeldt, Loeb & Wyckoff, 2013). Virginia’s higher performing schools in urban areas of high poverty appeared to have a more stable group of effective, committed teachers and strong principals (JLARC, 2014) which supported higher student achievement.

In addition, research purports that principals become more effective as they gain experience (Beteille, et al., 2011), especially during their first 3 years (Clark et al., 2009). However, principal inexperience is prevalent in low performing schools. In Miami-Dade County Public Schools, low performing schools were found to more likely have a first-year principal (20% versus 11%), a principal with less experience on average (2.5 years versus 5.1 years), or a temporary or interim principal (17% of school year versus 5%) (Horng et al., 2009, p. 9). The proportion of first-year principals in the low-performing bottom quartile Texas schools was 40% greater than in higher performing schools in the top quartile (Branch et al., 2013, p. 8).

**School Level and School Size**

School level structural variables (elementary, middle and secondary) and school size (enrollment) have been found to have important implications on successful leadership
Elementary level and smaller size schools support an environment in which perceptions of leadership are more positive in comparison to larger schools (Louis et al., 2010). Overall, high schools tend to be larger and present more complex challenges to leadership’s direct oversight of the instructional program and ability to impact the connections among teachers and between teachers and students (Louis et al., 2010).

Principal impact is greatest at the elementary level, less at the middle school level, and least at the high school level, and evidenced by students in elementary schools performing better on state tests than students in upper grades (Louis et al. 2010). Evidence suggests that school improvement at the secondary level is far more complicated than at the elementary level due in part to the adult responsibilities faced by the students, the need to address diverse student postsecondary goals, and the academic departmentalization of teachers (Le Floch, K.C., O’Day, J., Birman, B., Hurlburt, S., Nayfack, M., Halloran, C. & Hulsey, L., 2016; Rennie Center, 2005). Student gaps in knowledge and skills accumulate from elementary through middle and into high school, complicating academic remediation (Kutash et al., 2010). “High schools tend to have larger numbers of students and lack the resources to intervene proactively with students on an individual level” (Kutash et al., 2010, p.47). High schools are typically the larger of schools and the leadership responsibilities are distributed through content coaches or department heads (Leithwood et al., 2004), restricting the development of direct relationships with teachers.

A traditional grade level configuration was a characteristic of 34 of 36 schools in the study and findings regarding the negative impact of transitions are discussed. Transitions from one school level to the next impact students and their achievement. A Florida study found large and statistically significant drops in achievement at both grade 6 and grade 7 with students entering middle school with estimates indicating that mathematics achievement falls by 0.12
(0.22) standard deviations and reading achievement falls by 0.09 (0.15) standard deviations for transitions at grade 6 (grade 7) (Schwerdt & West, 2012, p. 11). As students transition to high school in grade 9, small but statistically significant drops occur in achievement: mathematics achievement falls by 0.03 standard deviations and reading achievement falls by 0.05 standard deviations (Schwerdt & West, 2012, p. 13). Rockoff and Lockwood (2010) found that for students transitioning between elementary and middle, rather than continuing in a K-8 school, achievement drops dramatically in reading (.16) and mathematics (.18) and the impact on low socioeconomic populations is greater.

The optimal size for elementary schools seems to be 250 to 300 and 600 to 700 for secondary schools (Lee, Ready & Johnson, 2000, as cited by Leithwood et al., 2004, p. 51). Results from a recent study of California schools seeking to determine what makes successful schools different from other schools in “beating the odds,” identifies smaller school enrollment as a contributing factor to school success across elementary and secondary (Voight et al., 2013). In a study of 1997 of over 5,000 teachers in Chicago schools and student achievement, mathematics achievement was greater in smaller schools at the elementary and secondary level with total effects of school size on mathematics learning favoring “small schools on mathematics learning of .64 SD as compared with medium-sized schools, .and .45 SD as compared with large schools” (Lee & Loeb, 2000, p. 22). Leithwood and Jantzi’s (2009) review of 57 studies on school size found that students from disadvantaged social and high poverty homes benefit from smaller schools. Smaller schools provide an environment that is more conducive for relationship building between students and adults which supports increased accountability for attendance and schoolwork (Lee et al., 2001; as cited in Leithwood et al., 2004, p. 51). Leithwood and Jantzi (2009) identified a positive relationship between students’ connection with school in smaller
schools which was manifested in higher attendance and engagement, which supports higher achievement. Research on the indirect effects of leadership suggest that leadership behaviors significantly associated with achievement in mathematics (focused instruction, professional community and trust in the principal) support close relations with adults being an important factor in determining how students perform (Louis et al., 2010). Additionally, instructional leadership in smaller schools is frequently provided directly by the principal whereas in a larger school the leadership responsibilities may be distributed through content coaches or department heads, thereby being more indirect (Leithwood et al., 2004), thereby reducing the interaction between principals and teachers.

**Synthesis of Research**

Research on the influence of leadership on student achievement began with small qualitative case studies comparing schools which evidenced increased achievement with schools that evidenced declining achievement (Weber, 1971; Brookover & Lezotte, 1979). Qualitative data (e.g., questionnaires and interviews) led to identification of key levers or recommendations for improving achievement, however, results from such small numbers were unable to be generalized. Key levers identified in these earlier studies were explored in the next wave of research on leadership and student achievement, as well as by leadership theorists. At the turn of the century, researchers began exploration of the wealth of research studies from the previous 30-40 years by using meta-analysis to summarize quantitative data in an effort to explain the direct and indirect effect of leadership and student achievement (Hallinger and Heck, 1996b; Leithwood et al., 2004; Robinson et al., 2008; Waters et al., 2003; Witziers et al., 2003). Although initial studies exploring the direct effect of leadership on student achievement found negligible effects (Witziers et al., 2003), larger meta-analysis studies that examined the indirect
effects of leadership found small but significant effects (Waters et al., 2003; Leithwood et al., 2004; Robinson et al., 2008). One of the larger studies was conducted by Waters et al. (2003) using results from their meta-analysis of 70 studies (2,894 schools) to calculate an estimated effect of 21 leadership responsibilities on student test scores. Other research combined case studies and large scale quantitative analysis based on contingency theory to delve into the core of leadership (Leithwood, et al., 2004).

The 10 PIMRS functions were explored through the lens of existing research on the relationship of leadership and student achievement and the four major leadership theories on the basis that the PIMRS model attends to purposes, people and structures within the larger school organization, as this tool includes measures for the key leadership levers identified in research and explored in theory. Principals’ goal setting, or setting of direction, has surfaced as a consistent determinant in student achievement across previous studies (Hallinger & Heck, 1996; Leithwood et al., 2004; Robinson et al., 2008; Waters et al., 2003). Strong leadership was identified as having the greatest positive or negative influence on all schools (Hallinger & Heck, 1996; Leithwood & Jantzi, 2000), having the greatest impact in those schools needing it the most (Leithwood et al., 2004).

Hallinger (2005) proposed that it was meaningless to study principal leadership without reference to school context (i.e., organizational structure, school size) as the leadership principals exercise is influenced by the school’s contextual constraints. Therefore, details of the federal and state-imposed constraints under which the school leaders in this study labor, as well as the limited improvement of low-performing schools nationwide, were detailed in this chapter. Principal turnover negatively impacts leadership impact initiatives related to improving student achievement (Fink & Brayman, 2006; Hallinger & Heck, 2009) and stability of leadership for
four or more years is critical to fully developing school-level processes (Louis, et al., 2010). Smaller school enrollment has been found to be a contributing factor to improving student achievement across elementary and secondary (Voight et al., 2013) with even more benefits for disadvantaged students (Greshenson & Langbein, 2015; Leithwood & Jantzi, 2009). High schools tend to be larger and present more complex challenges to leadership, relationship building and the direct oversight of the instructional program and students (Louis et al., 2010).
Chapter 3

METHODOLOGY

Introduction

This study employed descriptive and hierarchical regression statistics to examine the relationship between principal instructional leadership behavior and student achievement in low performing schools. Based on research that purports the influence of principal demographics (tenure and principal experience) and school characteristics (level and size) on student achievement in low performing schools, hierarchical regression analysis was used to examine the relationship between principal instructional leadership behavior and student achievement in English/Reading and in mathematics while controlling for the influence of principal tenure and experience and school level and size. Substantial evidence exists for the impact of these antecedent variables on student achievement, especially in low performing schools.

Participants for the study included teachers and principals from the 36 schools identified by VDOE as priority schools in 2012-2013. The lowest-performing 5% of Title I schools based on the “All Students” group performance in English/reading and mathematics, or Title I high schools with a federal graduation rate of less than 60%, are identified as priority schools under Virginia’s ESEA Flexibility Waiver (2013). This study utilized results from the Principal Instructional Management Rating Scale Teacher Form (Hallinger, 1983) that were provided upon request of the researcher by the VDOE Office of School Improvement. Per agreement with VDOE, schools were coded, and statistical analysis and findings were treated in aggregate to ensure anonymity of the schools (see Appendix A). Additional data points were collected through VDOE archival and web-based reporting systems.
Setting of the Study

The relationship between principal instructional leadership behavior and student achievement was explored in the lowest performing 5% of schools in Virginia. The population included each of the 36 schools identified as priority schools by the state of Virginia with a focus on the 2012-2013 school term. The following variables were explored for each priority school: principal instructional leadership behavior as perceived by teachers; student achievement on Virginia Standards of Learning assessments in English/reading and mathematics, and; principal demographics (principal tenure in the building and experience as a principal); school structure (school level and size).

The 36 identified priority schools comprised three cohorts of grantees: Cohort I (n=17) 2010-2011, Cohort II (n=9) 2011-2012 and Cohort III (n=10) 2012-2013. Twenty-six schools in Cohort I (FY2009) and Cohort II (FY2010) were identified as low-performing prior to the ESEA Flexibility Waiver based on the requirements of the Elementary and Secondary Education Act of 1965 as amended by the No Child Left Behind Act of 2001. According to the Virginia’s ESEA Flexibility Waiver, the previously identified 26 low performing schools in Cohort I (n=17) and Cohort II (n=9) under NCLB were required to continue the required 3-year implementation of their chosen turnaround intervention model before being considered for exit in 2012-2013. Although 26 schools (Cohort I and Cohort II) were originally identified on the basis of Criterion A or Criterion B, they became priority schools under Criterion C under the 2012 waiver in order to complete their 3-year school improvement grant and NCLB intervention requirement. The United States Education Department’s acceptance of Virginia’s waiver request allowed the state flexibility in accountability for low-performing schools for the 2012-2013 year, yet held the state accountable for identifying 5% of the total number of Title I schools as priority schools. In 2012,
Virginia had 723 Title I identified schools and 5% of 723 totaled 36 schools. Therefore, 10 new schools were identified as priority schools under Criterion C for 2012-2013 based on the schools’ 2011-2012 state’s standards-based assessment results in reading and mathematics. With the addition of 10 schools, Virginia met the requirement of identifying 5% of the total number of Title I schools (n=36), as 26 schools were continuing to fulfill the required 3-year school improvement grant implementation cycle.

The VDOE Office of School Improvement (OSI) required all priority schools to participate in the Principal Instructional Management Rating Scale (PIMRS) survey. Administration comprised a pre- and post-survey to be completed by the principal’s supervisor(s), principal and building-level teachers annually. It was the VDOE Office of School Improvement’s belief that the 360° data gleaned from the PIMRS would support principals in goal-setting for the state required implementation of the new principal evaluation system. Teacher survey results captured the frequency with which teachers perceived their principal exhibiting instructional leadership behavior as measured by the 10 PIMRS Functions.

**Design of Study**

Although the purpose of this quantitative, non-experimental, explanatory, cross-sectional study was to explore the relationship between principal instructional leadership and student achievement in the context of a population of low-performing schools, the influence of principal demographics and school structures on student improvement is well documented. Principal tenure and experience and school level and size were explored as control variables on the relationship between leadership behavior and student achievement. Participants in this study included teachers and principals of the 36 schools identified as lowest-performing in one state. Philip Hallinger’s *Principal Instructional Management Rating Scale* (1984) survey results were
used to evaluate teacher perceptions of their principals’ instructional leadership behavior in the ten leadership functions as a basis for investigating a correlation with student performance results in English/Reading and mathematics.

Stemming from the positivist philosophy, the post-positivist viewpoint is based on determinism, reduces testing to a discrete set of ideas, relies on an empirical observation and collection of data, and culminates in theory verification (Phillips and Burbules, 2000; Creswell, 2009; Airyan, 2012). This viewpoint guided the researcher in selecting a quantitative correlational cross-sectional design to identify and assess the humanistic behaviors, or physical conditions, which may influence student achievement outcomes in this context. The inclusion of a hierarchical regression model allowed the researcher to understand the influences and relationships among the following variables: principal tenure in the building (range of principal of tenure – 1 Year; 2-4 Years, 5-9 Years, 10-14 Years, 15 or more Years); experience as a principal (range of experience as a principal - 1 Year, 2-4 Years, 5-9 Years, 10-14 Years, 15 or more Years); teacher perceptions of principals’ instructional leadership behaviors (PIMRS survey results); school level (elementary, middle or high school); school size (small, medium or large), and school-level student achievement. Ensuring the anonymity as required by the VDOE Office of School Improvement required grouping of the population and removal of all school codes for analysis (See Appendix A).

A descriptive study of data point characteristics served as the entry point to understand the population and its characteristics. Descriptive data for the teacher PIMRS survey responses (N=1210) was examined to identify any patterns and describe relationships in principal leadership behavior. Data points were analyzed across all schools, through unidentified school-
level frequency analysis, and by aggregate groups based on principal demographics (tenure and experience), school characteristics (level and size) and student achievement.

**Research Questions**

**Overarching Research Question**

One overarching question and two research questions guided this study. The overarching question sought the nature of the relationship between teacher perceptions of specific instructional leadership behaviors of the school principal as measured by the PIMRS and student achievement in English/Reading and mathematics in the context of the 36 lowest-performing Title I schools in Virginia. The two research questions delved into impact of instructional leadership behavior and research-based antecedent variables (principal tenure, experience as a principal, school level and school size) on student achievement in English/Reading and mathematics.

**Research Question 1**

How does principal leadership behavior influence academic achievement in English/Reading once principal characteristics (tenure and experience) and school structures (level and size) are taken into account in low performing schools in the state of Virginia?

**Research Question 2**

How does principal leadership behavior influence academic achievement in mathematics once principal characteristics (tenure and experience) and school structures (level and size) are taken into account in low performing schools in the state of Virginia?

To answer Research Question 1, English/Reading student achievement served as the dependent variable. For Research Question 2, mathematics achievement served as the dependent variable. For each research question, the relationship between principal leadership behavior in
the PIMRS 10 Functions (predictor variable) and student achievement (dependent variable) was examined while controlling for the covariates for principal demographics (tenure and experience) and school structures (level and size). Hierarchical linear regression was used to examine the amount of variance in the dependent variable and independent variable, while accounting for the covariate variables. This statistical analysis is used to determine whether newly added variables significantly improve R² (the proportion of explained variance) in the dependent variable by the model and is useful for disentangling the effects of between- and within-group variance. A hierarchical regression analysis with 3 models was conducted. In Model 1 the influence of principal tenure and experience (control variables) on achievement (dependent variable) was explored. In Model 2, principal tenure and experience were retained as variables and the covariates of school level and size were added to the model. In Model 3, the covariates for principal demographics and school structures were retained and teacher perceptions of instructional leadership on the PIMRS was added. The significance of the models and change in variance were analyzed.

**Instrumentation/Data Collection**

For the purposes of the study, the researcher used results obtained from a VDOE-required administration of the Principal Instructional Management Survey (PIMRS) instrument developed by Philip Hallinger in 1982 as the measure for principal leadership. A more recent version, the PIMRS Teacher Form 2.1, was used in this study as a measure principal leadership. The instrument measures teachers’ perceptions of the frequency with which their principals exhibit specific instructional leadership behaviors aligned to the PIMRS 10 Functions. Although the VDOE Office of School Improvement had originally pursued use of the Vanderbilt Assessment of Leadership in Education survey tool, the publisher declined to enter into a purchase agreement
with the VDOE on the basis of philosophical differences. Permission to use the PIMRS data for this study was granted to the VDOE by Philip Hallinger.

The PIMRS has been used in excess of 200 research studies since its development (Hallinger, 2011a). In a research review on the use of the PIMRS over the past 25 years, Hallinger (2008) noted that the PIMRS has proven a reliable means of collecting data on principal instructional leadership at the elementary and secondary levels. The scale measures the principal’s active leadership in an area, not necessarily the effectiveness of performance (Hallinger, 2008). This study employed the PIMRS to investigate the relationship between teachers’ perceptions of the frequency with which the principal exhibited the instructional leadership behaviors measured by the tool and student achievement. Additionally, the PIMRS descriptive data was used to identify patterns in instructional leadership in low-performing schools.

The PIMRS Teacher Form 2.0 is comprised of two parts. Part I consists of 2 basic questions that collect descriptive data. Data from Part I of the Teacher Form was not used in this study. Part II consists of 50 items that describe instructional leadership behaviors. The 50 items are grouped into 10 instructional functions, or subscales, of 5 items each. The 10 instructional leadership functions are grouped into 3 overarching dimensions. Teachers used a 5-point Likert scale to rate each item as to the frequency with which the principal exhibited a behavior or practice relative to the instructional leadership item. Teachers responded as follows: 1. Almost never; 2. Seldom; 3. Sometimes; 4. Frequently; or 5. Almost always. A Likert scale is an effective tool for use in studies that evaluate behaviors or attitudes on a continuum such as never to frequently and the interval scale is conducive to quantitative data collection. A set of 5 survey items comprise each of the 10 functions, see Appendix B.
Function 1: Framing the School’s Goals and Function 2: Communicates the School’s Goals comprise Dimension 1: Defining the School Mission. The two sets of instructional leadership functions comprised of five items each capture the teachers’ perceptions of the frequency with which their principal’s leadership actions or practices that related to ensuring a clear mission was focused on student academic progress and the vision was communicated widely with staff by the principal (Hallinger, 2008; Hallinger, 2010; Hallinger, Wang & Chen, 2013- EAQ 2013). Function 3: Supervising and Evaluating Instruction, Function 4: Coordinating the Curriculum, and Function 5: Monitoring Student Progress are included in Dimension 2: Managing the Instructional Program. Function 3, 4 and 5 items focus on the principal’s actions related to “managing the technical core” of the school and assuming responsibility for the coordination and control of the academic program (Hallinger, 2008; Hallinger, 2010; Hallinger et al., 2013). Function 6: Protecting Instructional Time, Function 7: Maintain High Visibility, Function 8: Provide Incentives for Teachers, Function 9: Promote Professional Development, and Function 10: Providing Incentives for Learning are contained in Dimension 3: Promoting a Positive School Learning Climate. Items in these functions are associated with the presence of “academic press” and high expectations that support and reward learning and exemplary contributions by teachers (Hallinger, 2008; Hallinger, 2010; Hallinger et al., 2013).

Reliability and Validity

Instruments used for data collection must meet reliability and validity standards. Reliability refers to the instruments’ internal consistency across constructs and time (Creswell, 2009). Validity of the instrument refers to the degree with which the tool measures what it is intended to measure (Gay et al, 2009). In a review of research that employed the use of the
PIMRS over the past 25 years, Hallinger (2008) noted that the PIMRS has proven a reliable and valid means of collecting data on principal instructional leadership at elementary and secondary levels.

**Reliability**

Based on a recent meta-analysis (Hallinger et al., 2013), the PIMRS Teacher Form was found to meet the reliability standards for each level of the instrument as measured by the Cronbach’s Alpha: the 10 functions with a range from .91 (Incentives for Learning) to .83 (Highly Visible, Incentives for Teachers); the 3 dimensions with a range in from .90 (Create a Mission) and .94 (Develop School Climate), and; Whole scale of .97 as shown in Table 5. Whole scale reliability was a .97 Cronbach’s Alpha. Reliabilities of .70 and above are considered good (Nunnally, 1978, p. 245).

Table 5

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function 1: Frame Goals</td>
<td>.90</td>
</tr>
<tr>
<td>Function 2: Communicate Goals</td>
<td>.88</td>
</tr>
<tr>
<td>Function 3: Supervise Instruction</td>
<td>.87</td>
</tr>
<tr>
<td>Function 4: Coordinate Curriculum</td>
<td>.89</td>
</tr>
<tr>
<td>Function 5: Monitor Progress</td>
<td>.88</td>
</tr>
<tr>
<td>Function 6: Highly Visible</td>
<td>.83</td>
</tr>
<tr>
<td>Function 7: Incentives for Teachers</td>
<td>.83</td>
</tr>
<tr>
<td>Function 8: Professional Development</td>
<td>.87</td>
</tr>
<tr>
<td>Function 9: Incentives for Learning</td>
<td>.91</td>
</tr>
<tr>
<td>Function 10: Protects Instruction Time</td>
<td>.86</td>
</tr>
</tbody>
</table>

Assessing the Measurement Properties of the PIMRS: A Meta-Analysis of Reliability
Hallinger, et al. (2013, p. 295)

A meta-analysis of PIMRS studies over the past 25 years encompassed 33 studies in which the PIMRS Teacher Form was employed. Researchers faced a dilemma in measuring the reliability as the studies had employed 3 different types of reliability tests: Cronbach’s Alpha,
Ebel’s test, and Gen Reliability. As indicated in Appendix D, summary data from 25 studies conducted in the United States demonstrated the reliability for the 10 PIMRS Functions with the Generalizability Theory on raw data ranging from .96 to .91 and the Cronbach’s Alpha for extracted data ranging from .90 to .81 (Hallinger et al., 2013). As recommended by Hallinger et al. (2013), this study used the Generalizability Theory Test to examine the reliability of the PIMRS Teacher Form survey data collected. Due to teachers in each school evaluating only their own principal’s instructional leadership behaviors, the teachers’ scores are nested within their principal. As noted by Hallinger et al. (2013, p. 31), a split-plot design that takes into consideration that all teachers in each school evaluate the school’s principal on the same set of items provides that the reliability coefficient should be concerned with the dependability of the principal means, rather than the individual teacher ratings.

**PIMRS Teacher Survey Data**

In total, 1350 teachers across the 36 schools opened a PIMRS Teacher Form survey that collected teacher perceptions of the frequency with which they observed their principal’s instructional leadership behaviors. The unit of analysis was the survey results of teachers’ perceptions of their principal’s leadership behaviors in the low performing schools identified under Virginia’s ESEA Flexibility Waiver (2013) as priority schools for the 2012-2013. Identified priority school principals totaled 36 (n=36) for 2012-2013. The researcher screened nonresponse items and identified a threshold of 66% completion of the PIMRS survey for inclusion of the survey results in the data analysis of the PIMRS functions and dimensions. Of the 1350 total returned surveys, 140 surveys were removed prior to data analysis. Surveys with less than 66% (less than 35 of 50) items responded to were eliminated from the survey data. Of the 140 surveys removed 19 surveys evidenced less than 66% (33 or more) completion of the 50
items: 2 surveys had 17 items with no responses; 11 surveys had between 20 and 39 items with no responses, and; 6 surveys had between 51 and 49 items with no responses. Although another 121 surveys showed evidence of being opened, no responses were recorded. A total of 1210 PIMRS Teacher Form survey results were analyzed for percent of nonresponses and reliability. A review of the survey responses from the 1210 teachers on the PIMRS Teacher Survey of 50 items revealed the following: 26 individual survey items evidenced no responses from 10 or fewer teachers; 20 items evidenced no responses from between 11 and 20 teachers, and; 4 items evidenced no responses from between 22 (1.8%) and 27 (2.2%) teachers as seen in Appendix D. The 4 most frequent items not responded to included:

- Item 38 – Acknowledge teachers’ exceptional performance by writing memos for personal files. (22 total non-respondents, or 1.8%)
- Item 48 – Recognize superior student achievement or improvement by seeing in the office the student and their work. (26 non-respondents, or 2.1%)
- Item 49 - Contact parents to communicate improved exemplary student performance or contributions. (26 non-respondents, or 2.1%)
- Item 20 – Participate actively in review of curricular materials.

Remaining surveys with missing items were updated using a frequency analysis conducted on the PIMRS item responses by function through SPSS. Responses from the survey instrument were analyzed using a frequency distribution with SPSS statistical software, see Appendix E. A follow up reliability analysis was run for the full scale, 10 leadership functions (Framing the School’s Goals; Communicating the School’s Goals; Supervising and Evaluating Instruction; Coordinating the Curriculum; Monitoring Student Progress; Protecting Instructional Time; Maintaining High Visibility; Providing Incentives for Teachers, Promoting
Professional Development, and; Providing Incentives for Learning) by examining scale mean if item deleted, scale variance if item deleted, corrected item-total correlation and Cronbach’s Alpha if item deleted. The full scale reported a Cronbach’s Alpha of .989. Reliability for the 10 functions ranged from .882 to .949.

As noted, Hallinger et al. (2013) recommends using the Generalizability Theory on the raw item level data to examine the within-subject effects as well as the between-subject effects to determine the reliability of teacher ratings of their school principal’s instructional behaviors within the school, as well as between schools. A mixed design ANOVA was used to obtain the Test of Within-Subject Effects and Test of Between-Subject Effects to calculate the Gen Reliability of the data set. The calculation for the Gen reliability of the PIMRS 50 item whole scale provided reliability of .997. A comparison of Cronbach’s Alpha and the Gen Reliability test results were used to confirm reliable variance in the instrument for this study. Reliability measured by the Cronbach’s Alpha for Function 1 – 10 ranged from .882 to .949 compared to the variance measured by the Generalizability Test with a range between .978 and .991. There is evidence of overall consistency in the PIMRS survey items with a Cronbach’s Alpha of .989 and Gen Test of .997, see Appendix F.

Validity

The PIMRS was initially validated at the elementary level with all ten subscales exceeding .90 using Cronbach’s test of internal consistency and validation was expanded by a review of research employing the PIMRS over a 25-year period (Hallinger, 2008). The internal consistency of the instrument was analyzed to determine to what degree items grouped together conceptually as subscales, or job functions, correlate with each other. The minimum standard reliability for behaviorally anchored rating scales should be set at .80 when assessing the internal
consistency of the instrument (Latham and Wexley, 1981 as cited in Hallinger & Chen, 2015). The content validity of the PIMRS was examined through the average agreement of experts familiar with instructional behaviors of principals resulting in a range from 80% to 100% agreement that items should be grouped by the 10 functions as included in the PIMRS, see Appendix G.

Validity of PIMRS was demonstrated by examining results across principals of different school by employing an analysis of variance statistical test. In a study of multiple principals there should be evidence of the subscales discriminating among principals. In general, there should be less variance among ratings within schools than across schools as shown in Appendix H. This was the finding in most cases based on the meta-analysis of 25 years of implementation (Hallinger, 2008). Two functions, Professional Development and Academic Standards, did not meet the statistical significance level as presented in the meta-analysis study.

Construct validity of the PIMRS was demonstrated by examining the inter-correlation of the 10 subscales, or functions as shown in Appendix I. The five items per subscale were more strongly correlated with each other than with other subscales. The Cronbach α ranged from .78 to .90. The Cronbach α for each subscale exceeds .80, except the subscale Incentives for Teachers.

According to Hallinger (2011a, 2011b; Hallinger et al., 2013, p. 273), the PIMRS continues to be an instrument of choice among scholars studying principal leadership based on consistent yields of valid and reliable data. The content validity of the 10 functions met the recommended .80 agreement level for a behaviorally anchored scale among a team of experts. Although the subscale correlation should be low, Hallinger & Wang (2013) maintain that the narrow focus of on instructional leadership may cause subscales to exhibit a higher correlation. Construct validity was established through the examination of documents aligned with the
instructional management behaviors measured by the instrument, yielding a general agreement across six subscales (Hallinger & Wang, 2013, pg. 44).

**Data Collection**

Teacher perceptions of their principal’s instructional leadership behaviors, student achievement (English/reading and mathematics), school characteristics (level and size) and principal demographics (tenure and principal experience) comprise the data points explored in this study. Data were collected in 4 phases. The researcher obtained a listing of the 36 lowest performing schools identified as priority schools under Virginia’s *Elementary and Secondary Education Act (ESEA)* Flexibility Waiver (2013) from the VDOE website. Next, the results of PIMRS Teacher Form Part II that measured teachers’ perceptions of the frequency with which their principal exhibited instructional leadership behaviors related to the 10 PIMRS Functions were collected. Then, the tenure range and experience range of the principal in each of the 36 schools was collected from the Principal Form Part I survey data that provided self-reported responses on tenure and experience by range for each of the 36 school principals from VDOE Office of School Improvement. Finally, student achievement data for English/reading and mathematics by grade level, or content area, for each school and the state was collected using the VDOE website’s archival data query, Build-A-Table tool as seen in Appendix J, providing the basis for the calculation of a predicted scaled score. School characteristic data (level and size) were collected from the Annual School Report Card and Fall Membership Data Report through VDOE website. Per VDOE’s requirement for anonymity of individual schools, each school was assigned a numerical code designation (i.e., School 01, School 02, etc.) and analyses of descriptive data was done in aggregate groups to ensure school anonymity. Schools were grouped schools by level (i.e., elementary, middle and high) and size (small = 1, medium = 2 and
large = 3) which were interval coded for anonymity. Principal data (years of tenure and experience) was collected and analyzed in spans to conceal identity.

In the first phase of this study, the researcher collected data from the PIMRS 2.0 Teacher Survey Form, administered to teachers in spring 2013 in 100% (N=36) of Virginia’s lowest performing schools identified as priority schools. The VDOE Office of School Improvement required the administration of the PIMRS survey for supervisors, principals and teachers as a tool to support goal-setting by principals of low-performing priority schools based on the state’s required implementation of a state-mandated division-level principal evaluation system. The VDOE Office of School Improvement administered the PIMRS Teacher and Principal surveys via an online survey tool, Survey Monkey. A web-link for each school’s supervisor, principal and teacher survey was provided to the school principal for distribution. Per VDOE, it was left to principal discretion as to how the teacher survey was conducted at the school level. Suggestions included having teachers complete the survey at a called faculty meeting or emailing the link to teachers and providing a timeline for survey completion. The school’s key licensed content area teachers and intervention teachers (English, reading, mathematics, history, social studies, science, content interventionists, etc.) were to be surveyed. Surveys were anonymous, but linked to the school. Schools had access to the link for a 30-day window in accordance with the individual school calendar. The survey method provided the department with an efficient method for collecting data without threats to reliability. Although a fall and spring survey was required by VDOE, the researcher chose to use the 2013 Spring results as some principals were first year principals in the school and the lapse in time provided teachers the opportunity to observe the principal’s leadership behaviors. PIMRS teacher survey data was obtained from the VDOE Office of School Improvement.
To calculate an estimated PIMRS teacher survey collection rate, the researcher made a Freedom of Information Act (FOIA) request to the VDOE Department of Teacher Licensure, for the total number of core content teachers in each of the schools in the 2012-2013 school year. In response to the request, VDOE provided the total number of instructional personnel included in each school’s Instructional Personnel and Licensure (IPAL) report, including non-core licensed teachers. The total number of teachers reported includes all licensed instructional personnel by full time equivalency in each school (English, language arts and reading, mathematics, science, history, social studies, physical education, career and technical education, and library media specialists, etc.), excluding the principal and assistant principal.

Although the IPAL collects FTE data on teachers beyond the parameters of the VDOE directions for administration of the PIMRS survey, the IPAL Report results provided a basis for approximating a survey return rate. Calculations for the PIMRS survey return rates used the full-time equivalency (FTE) for teacher positions reported on each school’s IPAL report as the denominator and the number of surveys returned by school as the numerator to estimate a return rate percentage. Survey return rates ranged from 100% to 14%, see Appendix K. Three schools evidenced a 100% return on survey responses. Although one school did not have an IPAL report, 23 surveys were completed which represents a minimum of a 50% return rate based on the number of students and grade levels served by the school according to school staffing requirements in the Standards of Quality (Code of Virginia at §§22.1-253.13:1 – 22.1-253.13:10, 2015). Return rates for the 35 schools with an IPAL report were as follows: 93% or above (N=6); 70-88% (N=10); 50-68% (N=8); 34-49% (N=9), and; 14-19% (N=2). Overall, the return rate for the 35 schools with IPAL reports was 60% collectively. Reporting the return rate by percentage allowed the researcher to ensure anonymity of the schools in the study. There were no problems
with the PIMRS reliability data that were collected when examined using the Cronbach’s Alpha and Generalizability Theory.

The second phase of data collection focused on gathering principal demographic data, which captured each principal’s years of tenure in the present school and years of principal experience from Part I responses on the PIMRS Principal Form survey as shown in Appendix L. No other data from the PIMRS Principal Form was used for this study. Data were collected on principal tenure and experience as a principal of the 36 priority school principals. Principals reported on the number of years they had served as principal of the school, inclusive of the 2012-2013 school term, using a range of 1, 2-4, 5-9, 10-15 or more than 15 years. Principal tenure ranges were interval coded as follows: 1 = 1 year; 2 = 2-4 years; 3 = 5-9 years; 4 = 10 or more years. In addition, principals self-reported on the total number of years of experience as a principal they have had, inclusive of the 2012-2013 school term, using a range of 1, 2-4, 5-9, 10-15 or more than 15 years. Principal experience ranges were interval coded as follows: 1 = 1 year; 2 = 2-4 years; 3 = 5-9 years; 4 = 10 or more years.

The third phase of data collection focused on the collection of school characteristic data (level and size) from the Annual School Report Cards and Fall Membership Data Report posted on the VDOE website. Grade levels served by each school during the study were collected from the 2012-2013 Annual School Report Card through the VDOE website query tool. Data were used to group schools as elementary, middle or high school based on the grade span. Coding for school groupings is as follows: elementary schools = 1; middle schools = 2, and; 3 = high school. The researcher collected the school grade levels from the VDOE Annual School Report Card tool and documented the school size via student enrollment data from the archived Fall Membership Data Reports in the Reports and Statistics section of the VDOE website. Data were
used to categorize schools as small, medium and large. Small schools will range from 100 to 400, medium from 401 to 700, and large 701 and above. School level will be determined by grouping with traditional grade spans (K-5 elementary; 6-8 middle; and, 9-12 high school). Schools with non-traditional grade level spans will be categorized by the researcher based on most similar grade span. For example, a K-7 school will be categorized as elementary; a 6-12 school will be categorized as high school.

The fourth phase consisted of collecting student achievement data for each of the 36 priority schools and the state by grade-level or end of course content mean scale scores. Mean scaled scores were collected for English/reading and mathematics for 2011-2012 and 2012-2013 assessments. Data queries were run using the VDOE Build-A-Table tool to obtain grade-level or end of course content standards-based mean scale scores for the state and by individual school in the areas of English/reading and mathematics. The researcher attained the mean scale scores in reading and mathematics by grade for the state and by applicable grade level in each school for each school for 2011-2012, 2012-2013.

Quantitative methods were used to analyze survey responses from participants, student achievement, principal demographics and school structures. Descriptive analysis was used to analyze and describe the attributes of the quantitative data and identify potential groupings to explore data in an aggregate form. The relationship between principal leadership behavior (independent variable) and student achievement (dependent variable) was explored through a hierarchical linear regression while controlling for principal demographics (covariates) and school structures (covariates) to answer Research Question 1 and Research Question 2.
Descriptive Data

School Structures

Traditional school structures are elementary (K-5), middle (6-8) and high (9-12). Coding of school level by the researcher involved the grouping of schools with nontraditional grade spans into the most appropriate school level, see Table 6. Assignment of nontraditional schools to a school level was based on best fit by grade level. Nontraditional schools were assigned to school levels as follows: (a) schools with grades K-3 (1), PK-6 (1), PK-7 (1) and PK-8 (1) were included in the elementary school level; (b) schools with grades 6-11 (1) and 8-9 (1) were included in the middle school level; and (c) schools with grades 6-12 (1), 7-12 (1) and 8-12 (2) schools were included in the high school level group. Schools were separated by level based on research that purports the diminished impact of secondary schools on student achievement due to the lower levels of relationship building and complexity of remediation (Louis et al., 2010; Rockoff & Lockwood, 2010). School level was interval coded.

Table 6

<table>
<thead>
<tr>
<th>School Level</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary =1</td>
<td>13</td>
<td>36</td>
</tr>
<tr>
<td>Middle =2</td>
<td>13</td>
<td>36</td>
</tr>
<tr>
<td>High =3</td>
<td>10</td>
<td>28</td>
</tr>
</tbody>
</table>

School size data was based on student enrollment collected from the 2012 Fall Enrollment Report available through the VDOE Statistics and Reports website, see Table 7. The population contained schools in three size groupings as shown in Table 7: less than 400 students (n=13); 400-799 students (n=16); and, 800 students and above (n=7) based on and aligned to the research documenting the influence of smaller schools on improved student achievement.
School size was interval coded: small = 1, medium = 2, large = 3.

Table 7

*School Size for 2012-2013 Priority Schools*

<table>
<thead>
<tr>
<th>Student Population</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small = 1</td>
<td>13</td>
<td>36.1</td>
</tr>
<tr>
<td>Medium = 2</td>
<td>16</td>
<td>44.4</td>
</tr>
<tr>
<td>Large = 3</td>
<td>7</td>
<td>19.4</td>
</tr>
</tbody>
</table>

*Note: Small = < 400 students; Medium = 400-799 students; Large = ≥800 students.*

**Principal Demographics**

A cross-sectional approach was identified as a method of study based on the principal turnover rate in Virginia’s priority schools, see Table 8. During the year of the focused study (2012-2013) 7 of 26 (27%) schools from the previous year had new principals and 8 of 10 (80%) of newly identified low performing schools had new principals. In total 15 of 36 principals were new to their building in 2012-2013 (42%). From the initial SIG implementation in 2010-2011 through 2014-2015, 27 of 36 (75%) of schools had new principals. This led the researcher to identify the 2012-2013 school term as the population for study as the number of schools identified as priority exceeded the identification of schools in prior years and all principals remained in the school for the full school year. Although the amount of principal turnover precluded an overall longitudinal study, the researcher included principal tenure in the building and experience as a principal as covariates to understand the influence of principal tenure and experience on student achievement. Principal turnover has been associated with negative effects on student achievement (Beteille, et al., 2011; Ronfeldt, et al., 2013).
Table 8

Principal Turnover in Priority Schools 2010-2011 to 2013-2014

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>After 1st Year of SIG Implementation</td>
<td>4/17</td>
<td>6/9</td>
<td>4/10</td>
</tr>
<tr>
<td>After 2nd Year of SIG Implementation</td>
<td>1/17</td>
<td>5/9</td>
<td>NA</td>
</tr>
<tr>
<td>After 3rd Year of SIG implementation (13 schools exited priority status at end of 2012-2013 and 3 continued)</td>
<td>9/17</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Total Number of Schools in Cohort with a Principal Change (unduplicated count)</td>
<td>13/17</td>
<td>*9/9</td>
<td>**5/10</td>
</tr>
</tbody>
</table>

*2 schools in Cohort II evidenced principal change again for 2014-2015.

With regards to principal experience, years of experience ranged from 1 year (N=5) to more than 15 years (N=3). Fifty percent of principals had less than four or fewer years of experience as a principal and 14% of those principals were first year principals. The other 50% of principals (N=18) reported 5 or more years of experience as a principal and 5% of those had 10 or more years of experience as a principal as shown in Table 9. As principal experience increases, achievement tends to increase with the greatest gain in effectiveness occurring within the first 3 years (Clark et al., 2009).
Table 9

Principal Experience and Tenure in the Priority School 2012-2013

<table>
<thead>
<tr>
<th>Range of Years</th>
<th>Principal Experience</th>
<th>Principal Tenure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>1 year</td>
<td>5</td>
<td>13.9</td>
</tr>
<tr>
<td>2-4 years</td>
<td>13</td>
<td>36.1</td>
</tr>
<tr>
<td>5-9 years</td>
<td>13</td>
<td>36.1</td>
</tr>
<tr>
<td>10-15 years</td>
<td>2</td>
<td>5.6</td>
</tr>
<tr>
<td>More than 15 years</td>
<td>3</td>
<td>8.3</td>
</tr>
</tbody>
</table>

Principal Instructional Measurement Rating Scale

Descriptive data for teacher perceptions of principal instructional leadership behavior as measured by the PIMRS Functions are presented in Table 10. As indicated by the greater mean, principals across schools most frequently exhibited behaviors associated with Function 1: Frame School Goals (M=19.3926), Function 2: Communicates School Goals (M=18.9380), and Function 4: Coordinate the Curriculum (M=18.4174). According to the lesser mean in the PIMRS teacher survey data, the least frequently observed principal instructional leadership behaviors were those associated with Function 7: Maintain High Visibility (M=15.2099) and Function 8: Provide Incentives for Teachers (M=15.9669). The standard deviation was similar across the 10 PIMRS functions with a range of SD=5.16914 to SD=6.59565, meaning that variability from the mean was limited across schools. The standard deviation was highest in Function 8 and Function 7 (SD=6.59565 and 5.97366, respectively) which means teacher ratings evidenced the most variability in the frequency with which principals were observed engaging in actions related to providing teachers incentives and maintaining high visibility in the school.
Table 10

Descriptive Statistics for 10 PIMRS Functions

<table>
<thead>
<tr>
<th>PIMRS Function</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function 1 Frame School Goals</td>
<td>1210</td>
<td>19.3926</td>
<td>5.16914</td>
</tr>
<tr>
<td>Function 2 Communicate School Goals</td>
<td>1210</td>
<td>18.9380</td>
<td>5.46607</td>
</tr>
<tr>
<td>Function 3 Supervise/Evaluate Instruction</td>
<td>1210</td>
<td>17.9488</td>
<td>5.78787</td>
</tr>
<tr>
<td>Function 4 Coordinate the Curriculum</td>
<td>1210</td>
<td>18.4174</td>
<td>5.63988</td>
</tr>
<tr>
<td>Function 5 Monitors Progress</td>
<td>1210</td>
<td>18.1244</td>
<td>5.51729</td>
</tr>
<tr>
<td>Function 6 Protect Instructional Time</td>
<td>1210</td>
<td>17.4512</td>
<td>5.48821</td>
</tr>
<tr>
<td>Function 7 Maintain High Visibility</td>
<td>1210</td>
<td>15.2099</td>
<td>5.97366</td>
</tr>
<tr>
<td>Function 8 Provide Incentives for Teachers</td>
<td>1210</td>
<td>15.9669</td>
<td>6.59565</td>
</tr>
<tr>
<td>Function 9 Promote Professional Development</td>
<td>1210</td>
<td>18.3826</td>
<td>5.66780</td>
</tr>
<tr>
<td>Function 10 Provide Incentives for Learning</td>
<td>1210</td>
<td>17.7628</td>
<td>5.85084</td>
</tr>
</tbody>
</table>

Student Achievement

Student achievement served as the dependent variable for each of the 2 research questions. State mean scale scores by content for each grade and EOC assessment are presented in Appendix M and N. The average school mean scale score for English was below the state’s pass proficient rate (400) in each grade level with the only exception being English EOC. The range in percent change between 2011-2012 and 2012-2013 in English/reading state mean scale score was -39.86 to -58.38. English/reading school mean scale scores decreased from 2011-2012 to 2012-2013 at each grade level and EOC between 26.87 and 50.67 points.

For mathematics, the school mean scale score was below pass proficient in four grade levels (3, 5, 7 and 8). The range in percent change between 2011-2012 and 2012-2013 in
mathematics state mean scale score was -.34 to 9.29. Mathematics mean scale scores for schools in Grades 4, 6, Algebra I, Algebra II and Geometry were at or above pass proficient (400).

As noted, student achievement was measured by the Virginia’s Standards of Learning (SOL) English/reading and mathematics assessments using a calculated difference in predicted and actual mean scale scores. Due to changes in the rigor of the state’s standards and standards-based assessments during the study, the researcher hypothesized that the school’s mean scale score in each content area (English/reading and mathematics) should show the same change as the state’s mean scale score, at minimum. The difference in state mean scale test scores by content and grade and End of Course (EOC) from 2011-2012 to 2012-2013 was used to calculate each school’s predicted mean scale score as shown in Appendix O. The percent change in state mean scale score was applied to the 2011-2012 school mean scale scores to determine the predicted school mean score. Differences in predicted and actual school mean scale scores for each grade and EOC assessment were summed by content area and served as the measure of student achievement for English/reading and mathematics. Alternative assessments results were not included in the calculation for student achievement.

Summary

The first part of this chapter described the data collection. Next, a review of descriptive data provided an understanding of the principal and school characteristics to inform groupings for the data analysis. Content validity and reliability was examined for the principal leadership measure, the 10 PIMRS Functions. The data analysis procedures for Research Question 1 and 2 (Part 1 and Part 2) are presented in Table 11 and Table 12, respectively.

Table 11

<table>
<thead>
<tr>
<th>Research Question 1: Data Analysis Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure</td>
</tr>
<tr>
<td>---------</td>
</tr>
</tbody>
</table>

104
<table>
<thead>
<tr>
<th>PIMRS</th>
<th>Student Achievement (VA SOL 2012-2013 Scores)</th>
<th>10 Functions</th>
<th>English/Reading Mathematics</th>
<th>Pearson Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- 10 Functions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- English/Reading</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Mathematics</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 12

*Research Question 2: Data Analysis Procedure*

<table>
<thead>
<tr>
<th>Part 1 Measure</th>
<th>Independent Variable</th>
<th>Covariates</th>
<th>Dependent Variable</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIMRS</td>
<td>10 Functions</td>
<td>Principal Tenure</td>
<td>English/Reading</td>
<td>Hierarchical Linear Regression</td>
</tr>
<tr>
<td>Principal Demographics</td>
<td>Tenure</td>
<td>Principal Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School Structures</td>
<td>Level</td>
<td>School Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Achievement (VA SOL 2012-2013 Scores)</td>
<td>Size</td>
<td>School Size</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>English/Reading</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part 2 Measure</th>
<th>Independent Variable</th>
<th>Covariates</th>
<th>Dependent Variable</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIMRS</td>
<td>10 Functions</td>
<td>Principal Tenure</td>
<td>Mathematics</td>
<td>Hierarchical Linear Regression</td>
</tr>
<tr>
<td>Principal Demographics</td>
<td>Tenure</td>
<td>Principal Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School Structures</td>
<td>Level</td>
<td>School Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Achievement (VA SOL 2012-2013 Scores)</td>
<td>Size</td>
<td>School Size</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mathematics</td>
<td></td>
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</tbody>
</table>
CHAPTER 4
ANALYSIS OF STUDY

Introduction

In this era of high stakes accountability, principals face unprecedented pressure to ensure all students attain 100% proficiency in reading and mathematics under the implementation of the No Child Left Behind Act (2001). Additional accountability for student achievement was leveraged through Virginia’s state requirement that 40% of principal evaluation be based on multiple measures of student achievement. Accountability, in combination with key studies confirming the direct and indirect impact of leadership on student achievement (Hallinger, 2008; Leithwood et al., 2010; Marzano et al., 2005; Robinson et al., 2008), requires the integral engagement of principals in leadership behaviors that lead to improved student achievement outcomes.

The purpose of this study was to understand the relationship between principal leadership behavior as measured through teacher perceptions and student achievement in English/Reading and in mathematics in low performing schools. Based on research that purports the influence of principal tenure and experience and school level and size on student achievement in low performing schools, these variables were controlled for when examining the relationship between instructional leadership and student achievement. The review of research found that principal turnover (Beteille et al., 2011; Heck & Hallinger, 2009) and principal inexperience (Beteille et al., 2011; Louis et al., 2010) have a negative impact on student achievement. With regards to the influence of school structures and improved student achievement, research purports the evidence increased complexity and challenges to closing student learning gaps at upper grade levels as compared to lower grade levels (Rennie Center, 2005; Rockoff & Lockwood, 2010) and greater
success in increasing student achievement in smaller schools as opposed to larger schools (Hallinger & Murphy, 1985; Voight et al., 2013). Although effects of successful leadership have proven to be greater in the most challenged schools, there has been limited research on the specific actions employed by principals in the context of turnaround schools (Leithwood et al., 2004; Robinson et al., 2008).

**Research Questions**

**Overarching Research Question**

What is the nature of the relationship between teacher perceptions of specific instructional leadership behaviors of the school principal as measured by the PIMRS and student achievement in English/Reading and mathematics in the context of the 36 lowest-performing Title I schools in Virginia? The following 2 questions guided this study:

**Research Question 1**

How does principal leadership behavior influence academic achievement in English/Reading once principal characteristics (tenure and experience) and school structures (level and size) are taken into account in low performing schools in the state of Virginia?

**Research Question 2**

How does principal leadership behavior influence academic achievement in mathematics once principal characteristics (tenure and experience) and school structures (level and size) are taken into account in low performing schools in the state of Virginia?

**Analysis of Variables**

The chapter begins with an analysis of descriptive variables presented for independent predictor variable (leadership), dependent variable (achievement) and the control, or covariate, variables to include: (a) instructional leadership survey results, (b) student achievement data, (c)
school characteristics (level and size), and (d) principal demographics (tenure and experience).

Next, the data analysis procedures and results as they relate to the 2 research questions and null hypotheses are presented. Finally, a summary of the data is provided.

**Principal Instructional Management Rating Scale (PIMRS) Survey Data**

Analysis of the PIMRS descriptive data revealed that teachers observed principals most frequently engaged in activities associated with the following four functions: Function 1: Frame School Goals, followed by Function 2: Communicates School Goals, Function 4: Coordinate the Curriculum, and Function 9: Promote Professional Development. With regards to principal leadership behavior associated with Function 1: Frame School Goals, teachers observed principals engaged frequently in the following behaviors: developing a set of annual school-wide goals which incorporated academic goals; ensuring staff input on goal development and the use of student performance data to establish goals, and; ensuring that the school’s goals were easily understood and staff responsibilities in meeting them were clear. Principal leadership behaviors most frequently observed by teachers under Function 2: Communicates School Goals included: discussing the school’s academic goals with teachers; communicating the alignment of curricular decisions with these goals, and; communicating the school’s mission and goals through stakeholder meetings and visible displays. With regard to high ratings on principal leadership behaviors related to the school goals, the focus of the VDOE Office of School Improvement’s support for low performing schools centered on development of measurable school academic goals with input from stakeholders and communication of low performance status and goals with stakeholders.

Leadership behaviors associated with Function 4: Coordinate the Curriculum include principals engaged frequently in the following: monitoring classroom instruction and student
work to provide curriculum coverage and identifying areas of strength and areas for improvement; monitoring the alignment of the implemented curriculum to the written curriculum, clearly defining responsibilities for coordination of curriculum across grade levels; actively participating in the review of curricular materials, and using assessment results when making curricular decisions. With regards to principals frequently exhibiting behaviors related to the curriculum, VDOE OSI used curriculum alignment as a professional development topic for low performing schools. Supervision and evaluation of instruction was an integral part of the VDOE training to support principals in the implementation of the state’s then pending requirement for a teacher and principal evaluation system, however, the frequency of behaviors observed aligned more closely with principal’s behaviors associated with the coordination and delivery of the curriculum.

The least frequently observed principal instructional leadership behaviors were related to the following two functions: Function 7: Maintain High Visibility and Function 8: Provide Incentives for Teachers. Principal leadership behaviors less frequently observed by teachers under Function 7: Maintain High Visibility included: talking informally with students and teachers; visiting classrooms to discuss school issues with teachers and students; attending extra- and co-curricular activities; covering classes for teachers until a substitute or late teacher arrives; providing direct instruction to classes, or; tutoring students. Behaviors less frequently observed relative to Function 8: Provide Incentives to teachers included: reinforcing superior performance by teachers and staff in meetings or memos; complimenting teachers privately for their efforts; rewarding special efforts by teachers with opportunities for professional recognition, and creating professional growth opportunities for teachers as a reward for special contributions.
Survey return rates ranged from 100% to 14% (Table 21, Appendix G). Regarding the varied range of return rates, there are 3 potential explanations: the fidelity with which principals followed the VDOE directive for surveying only the key licensed instructional personnel; completion of surveys by non-FTE content personnel, and method used by principals to administer the survey and monitor the number returned. The return rate for 34 of the 36 schools was 33% or greater.

**Student Achievement**

Student achievement was measured by the Virginia’s Standards of Learning (SOL) English/reading and mathematics assessments. As noted, due to the change in rigor of state standards and assessments during the study, a difference in school mean predicted performance when compared with the state mean scale performance was calculated for each school. With regard to school achievement in English/reading and mathematics, the average calculated mean scale score by school was greater in English/reading than mathematics and schools demonstrated greater variability in mathematics than English/readings. In 2012-2013 schools were in their second year of implementing and assessing more rigorous mathematics standards and in the first year of implementing and assessing more rigorous English and reading standards. The variability in mathematics scale scores may reflect the different levels of alignment of the schools’ curriculum with the new standards whereas less variability in the English/reading scores may reflect the decline in scores across the state with the first-time assessment of the new standards.

**School Structures**

With regard to school size and student achievement, 16 (44.4%) schools identified as low performing were mid-sized with an enrollment between 400 and 799. The fewest low performing schools were large (N= 7) with an enrollment ≥ 800. When we examine the school levels at
which most low performing schools were found in this study, the similarity in the number of low performing schools at each level provides that low performing schools are represented at all levels – elementary (N=13), middle (N=13) and high school (N=10). The lower number of high schools identified as low performing may reflect the opportunities available for student retakes on the Standards of Learning assessments at the high school level which were not available for non-EOC grade level assessments at the elementary and middle school levels. Enrollment tends to increase at the middle and high school levels as multiple elementary feed into middle schools, then multiple middle schools feed into high schools. More than 90% of schools were characterized by traditional levels requiring a minimum of two transitions (elementary to middle and middle to high school).

**Principal Demographics**

With regards to how long principals were tenured in the school, the study found the following: 86% percent (N=29) of principals reported a range of 1 to 4 years for their tenure in the school and 11 (30.6%) of these 29 principals reported 1 year of tenure in the school, which indicates they were serving their first year as principal in the school. With regard to the length of time the principal had served as a principal in any school, the study found the that 18 (50%) of principals reported 4 or fewer years of principal experience. Of these 18 principals, 5 (27%) were serving their first year in a principalship. Eighteen (50%) principals reported 5 or more years of experience as a principal. The majority of schools in this study were led by principals with less than 4 complete years of tenure in the school, and half had less than four years of principal experience.
Analysis of Data

Prior to running the hierarchical regression analysis, the researcher conducted a correlation by item and factor analysis. The factor analysis was used to determine if a set, or group, of items from the PIMRS could be reduced to a smaller set of meaningful, or categorical, items that lent itself to an underlying concept or to facilitate interpretations (Rummel, 1970). Using a factor analysis scale, the items were reduced to 4 factors that were reflective of principal behavior sets as described below:

- **Factor 1:** an overall scale of general principal leadership behavior
- **Factor 2:** leadership behaviors associated with supervision and evaluation of instruction through frequent informal observations and providing feedback on strengths and weaknesses; ensuring classroom priorities aligned with school goals, and; recognizing teachers (formally and informally) for superior performance and improvement through incentives (e.g., professional growth opportunities)
- **Factor 3:** leadership behaviors associated with protecting instructional time from interruptions and including students were present for instruction and using data to recognize students and teachers for superior work or improvement, monitor progress towards school goals and identify strengths and weaknesses in the curriculum.
- **Factor 4:** leadership behaviors associated with maintaining high visibility that supports the building of relationships by taking time to talk informally with students and teachers, visiting classrooms to discuss school issues with teachers and students and attending/participating in extra- and co-curricular activities; complimenting teachers personally for their efforts
This section will explore the overarching question regarding the nature of the relationship between teacher perceptions of principal leadership behavior as measured by the PIMRS and student achievement in ELA/Reading and mathematics in the context of the 36 lowest-performing Title I schools in Virginia when principal tenure, principal experience, school level and school size are controlled for.

**Research Question 1**

Four separate regression analyses were conducted, one for each of the 4 factors identified through the factor analysis. Teacher perceptions of the frequency with which instructional leadership behaviors are exhibited by the principal served as the predictor and the covariates are two measures of the principal characteristics (tenure and experience) and two measures of school level characteristics (level and size). Student achievement in English/Reading served as the dependent variable. Three models are estimated in each regression. The first contains the predictors related to the principal characteristics, the second model introduces the school level measures and the third model adds the leadership behavior variable.

**Research Question 2**

Four separate regression analyses were conducted, one for each of the 4 factors identified through the factor analysis. Teacher perceptions of the frequency with which instructional leadership behaviors are exhibited by the principal served as the predictor and the covariates are two measures of the principal characteristics (tenure and experience) and two measures of school level characteristics (level and size). Student achievement in mathematics served as the dependent variable. Three models are estimated in each regression. The first contains the predictors related to the principal characteristics, the second model introduces the school level measures and the third model adds the leadership behavior variable.
Influence of General Scale of Leadership on English/Reading Achievement

Analysis of a general scale of leadership influence on student English/Reading achievement revealed that Model 1 provides that 2.6% of the variance in English/Reading achievement can be explained by the principal characteristics: length of principal tenure and amount of principal experience, see Table 13. The model is significant with $p = .000$, $F = 16.351$, $df = 2, 1207$. In Model 2, the addition of school characteristics (school level and school size) to principal characteristics (length of principal tenure and amount of principal experience) accounts for 13% of the variance in English/Reading achievement. The model is significant with $p = .000$, $F = 45.250$, $df = 4, 1205$. The addition of school characteristics (school level and school size) accounts for 10.4% of the variance in English/Reading achievement. The change is significant as indicated with $\Delta p \leq 0.000$. In Model 3, the addition of the general scale of leadership behaviors to a model which retains the principal characteristics (length of principal tenure and amount of principal experience) and the school characteristics (school level and school size) explains 13% of the variance in English/Reading achievement. The model is significant with $p = .000$, $F = 36.257$, $df = 5, 1204$. However, the $R^2$ change for Model 3 is not significant with $\Delta p = .564$, $p \geq .05$. Thus, the scale of general leadership behavior of the principal when added to the model does not substantially improve upon our ability to predict the achievement of students in English/Reading. In Model 2, the standardized beta for school characteristic: school size ($\beta = .397$) is larger than the beta for school characteristic: school level ($\beta = .260$), principal experience ($\beta = .227$), and principal tenure ($\beta = .209$) which suggests that school size is a stronger predictor of English/Reading achievement than other variables with smaller schools tending to have higher student achievement in English/Reading.

Table 13
Influence of Supervising and Evaluating Instruction and Recognition of Teachers for Performance on English/Reading Achievement

The influence of leadership behaviors associated with supervision and evaluation of instruction and recognition of teachers for their superior performance on the dependent variable of student English/Reading achievement was examined in the second regression (see Table 14). Model 1 and Model 2 demonstrated the same results as described in the previous regression. In Model 3, the addition of the of a scale focused on leadership behaviors in supervision and evaluation of instruction and recognition of superior teacher performance to a model which retains the principal characteristics (length of principal tenure and amount of principal experience) and the school characteristics (school level and school size) explains 12.8% of the variance in English/Reading achievement. The model is significant with \( p = .000, F = 36.585, df = 5, 1204 \). However, the \( R^2 \) change for Model 3 is not significant with a \( \Delta p = .179, p \geq .05 \). Thus,
the scale of leadership associated with supervision and evaluation of instruction and recognition of teachers for their superior performance when added to the model does not substantially improve upon our ability to predict the achievement of students in English/Reading. School size ($\beta = .397$) continued to be the strongest predictor of English/Reading achievement with smaller schools yielding greater student achievement when compared to larger schools, followed by school level ($\beta = .260$), principal experience ($\beta = .227$) and principal tenure ($\beta = .209$).

Table 14

Summary of Hierarchical Regression Analysis for Factor 2 Predicting English Reading Achievement

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$B$</td>
<td>$SE B$</td>
<td>$\beta$</td>
</tr>
<tr>
<td>#YRS Principal Tenure</td>
<td>-6.24</td>
<td>1.35</td>
<td>-.138*</td>
</tr>
<tr>
<td>#YRS Principal Experience</td>
<td>4.29</td>
<td>.92</td>
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<td>1.47</td>
<td>.26*</td>
</tr>
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<td>-.40*</td>
</tr>
<tr>
<td>Factor 2</td>
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</tr>
</tbody>
</table>

$R^2$ \quad .03* \quad .13* \quad .13*

$F$ \quad 16.35 \quad 45.30 \quad 36.59

$\Delta R^2$ \quad .03* \quad .10* \quad .00

$\Delta F$ \quad 16.35 \quad 72.22 \quad 1.81

* $p \geq .05$.

Influence of Protecting of Instructional Time and Using Data on English/Reading Achievement

The influence of leadership behaviors associated with protecting instructional time and using data to recognize students and teachers for superior work or improvement on the dependent variable of student English/Reading achievement was examined in the third regression (see Table
Model 1 and Model 2 demonstrated the same results as described in the previous two regressions. In Model 3, the addition of a scale of leadership behaviors focused on protecting instructional time and using data to recognize students and teachers for superior work or improvement to a model which retains the principal characteristics (length of principal tenure and amount of principal experience) and the school characteristics (school level and school size) explains 13.1\% of the variance in English/Reading achievement. The model is significant with $p = .000$, $F = 36.178$, $df = 5, 1204$. However, the $R^2$ change for Model 3 is not significant with a $\Delta p = .856$, $p \geq .05$. Thus, the scale of leadership associated with protecting instructional time and using data to recognize students and teachers for superior work or improvement when added to the model does not substantially improve upon our ability to predict the achievement of students in English/Reading. School size ($\beta = .397$) continued to be the strongest predictor of English/Reading achievement, followed by school level ($\beta = .260$), principal experience ($\beta = .227$) and principal tenure ($\beta = .209$).
Table 15

Summary of Hierarchical Regression Analysis for Factor 3 Predicting English Reading Achievement

<table>
<thead>
<tr>
<th>Variables</th>
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<th>Model 2</th>
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<th>Model 3</th>
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<td>SE B</td>
<td>β</td>
<td>B</td>
<td>SE B</td>
<td>β</td>
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<td>1.32</td>
<td>-.21*</td>
<td>-9.49</td>
<td>1.32</td>
<td>-.21*</td>
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<td>.139*</td>
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<td>.23*</td>
<td>7.01</td>
<td>.92</td>
<td>.23*</td>
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<td>11.60</td>
<td>1.47</td>
<td>.26*</td>
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<td>1.47</td>
<td>.26*</td>
</tr>
<tr>
<td>School Size</td>
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<td>-.40*</td>
<td>-18.94</td>
<td>1.60</td>
<td>-.40*</td>
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<td>.13*</td>
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<td>.13*</td>
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<td>ΔF</td>
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<td>72.22</td>
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</tbody>
</table>

* p ≥ .05.

Influence of Maintaining High Visibility and Recognizing Teacher Effort on English/Reading Achievement

The influence of leadership behaviors associated with maintaining high visibility that supports the building of relationships and complementing teachers personally on their efforts or performance on the dependent variable of student English/Reading achievement was examined in the fourth regression (see Table 16). Model 1 and Model 2 demonstrated the same results as described in the previous three regressions. In Model 3, the addition of the of a scale of leadership behaviors associated with maintaining high visibility that supports the building of relationships to a model which retains the principal characteristics (length of principal tenure and amount of principal experience) and the school characteristics (school level and school size) explains 12.8% of the variance in English/Reading achievement. The model is significant with $p = .000$, $F = 36.454$, $df = 5$, 1204. However, the R² change for Model 3 is not significant with a
\[ \Delta p = .267, \ p \geq .05. \] Thus, the scale of behaviors associated with maintaining high visibility that supports the building of relationships when added to the model does not substantially improve upon our ability to predict the achievement of students in English/Reading. School size (\( \beta = .397 \)) continued to be the strongest predictor of English/Reading achievement, followed by school level (\( \beta = .260 \)), principal experience (\( \beta = .227 \)) and principal tenure (\( \beta = .209 \)).

Table 16

**Summary of Hierarchical Regression Analysis for Factor 4 Predicting English Reading Achievement**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( B )</td>
<td>( SE )</td>
<td>( \beta )</td>
</tr>
<tr>
<td>#YRS Principal Tenure</td>
<td>-6.24</td>
<td>1.35</td>
<td>-.138*</td>
</tr>
<tr>
<td>#YRS Principal Experience</td>
<td>4.29</td>
<td>.92</td>
<td>.139*</td>
</tr>
<tr>
<td>School Levels</td>
<td></td>
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<td>School Size</td>
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</tr>
<tr>
<td>Factor 4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\( R^2 \) \( .03^* \) \( .13^* \) \( .13^* \)

\( F \) 16.35 45.30 36.45

\( \Delta R^2 \) .03* .10* .00

\( \Delta F \) 16.35 72.22 1.23

* \( p \geq .05 \).

With regard to the predictor variables, principal tenure and principal experience were significant in the models of each regression for English/Reading achievement. Based on the negative beta, schools in which the principal has been tenured for a longer time tend to have lower student outcomes in English/Reading performance than schools with shorter tenured principals. Schools led by more experienced principals have greater student achievement in English/Reading than those schools with less experienced principals. School level and size were also significant. Schools with upper grade levels tend to have greater student achievement in
English/Reading than schools with lower grade levels. Based on the negative beta, schools with smaller student populations tend to have stronger performance in English/Reading than schools with larger student populations.

**Influence of General Scale of Leadership on Mathematics Achievement**

Analysis of a general scale of leadership influence on student mathematics achievement revealed that Model 1 provides that 7.4% of the variance in mathematics achievement can be explained by the principal characteristics: length of principal tenure and amount of principal experience, see Table 17. The model is significant with $p = .000$, $F = 48.462$, $df = 2$, 1207. In Model 2, the addition of school characteristics (school level and school size) to principal characteristics (length of principal tenure and amount of principal experience) accounts for 15.1% of the variance in mathematics achievement. The model is significant with $p = .000$, $F = 53.756$, $df = 4$, 1205. The addition of school characteristics (school level and school size) accounts for 7.7% of the variance in mathematics achievement. The change is significant as indicated with $\Delta p \leq 0.000$, $F=14.655$, $df = 4$, 1205. In Model 3, the addition of the general scale of leadership behaviors to a model which retains the principal characteristics (length of principal tenure and amount of principal experience) and the school characteristics (school level and school size) explains 16.2% of the variance in mathematics achievement. The model is significant with $p = .000$, $F = 46.423$, $df = 5$, 1204. Addition of the general scale of leadership behaviors accounts for 1% of variance in mathematics achievement. The change is significant with a $\Delta p = .000$, $p \leq .05$, $F = 14.655$, $df = 5$, 1204. Thus, the scale of general leadership behavior of the principal when added to the model improves upon our ability to predict the achievement of students in mathematics. In Model 3, the standardized beta for principal experience ($\beta = .332$) is larger than the beta for school size ($\beta = .306$), school level ($\beta = .291$), principal tenure ($\beta = .197$).
and leadership ($\beta = .101$) which suggests that principal experience is a stronger predictor of mathematics achievement than other variables with schools having more experienced principals tending to have higher achievement in mathematics.

Table 17

*Summary of Hierarchical Regression Analysis for Factor 1 Predicting Mathematics Achievement*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
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</thead>
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<tr>
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<td>$B$</td>
<td>SE $B$</td>
<td>$\beta$</td>
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<tr>
<td>#YRS Principal Tenure</td>
<td>-8.82</td>
<td>1.96</td>
<td>-.131*</td>
</tr>
<tr>
<td>#YRS Principal Experience</td>
<td>12.98</td>
<td>1.34</td>
<td>.283*</td>
</tr>
<tr>
<td>School Levels</td>
<td>19.10</td>
<td>2.15</td>
<td>.29*</td>
</tr>
<tr>
<td>School Size</td>
<td>-22.04</td>
<td>2.34</td>
<td>-.31*</td>
</tr>
<tr>
<td>Factor 1</td>
<td>.17</td>
<td>.05</td>
<td>.10*</td>
</tr>
</tbody>
</table>

$R^2$                    | .07*    | .15*    | .16*    |
$F$                      | 48.46   | 53.76   | 46.42   |
$\Delta R^2$             | .07*    | .08*    | .01*    |
$\Delta F$               | 48.46   | 54.73   | 14.66   |

*p \geq .05.

**Influence of Supervising and Evaluating Instruction and Recognition of Teachers for Performance on Mathematics Achievement**

The influence of leadership behaviors associated with supervision and evaluation of instruction and recognition of teachers for their superior performance on the dependent variable of student mathematics achievement was examined in the second regression (see Table 18). Model 1 and Model 2 demonstrated the same results as described in the previous regression. In Model 3, the addition of the of a scale focused on leadership behaviors in supervision and evaluation of instruction and recognition of superior teacher performance to a model which retains the principal characteristics (length of principal tenure and amount of principal
experience) and the school characteristics (school level and school size) explains 16.5% of the variance in mathematics achievement. The model is significant with \( p = .000, F = 47.468, df = 5, 1204 \). Addition of a scale focused on leadership behaviors in supervision and evaluation of instruction and recognition of superior teacher performance accounts for 1.3% of variance in mathematics achievement. The change is significant with a \( \Delta p = .000, p \leq .05, F = 19.091, df = 5, 1204 \). Thus, the scale of leadership associated with supervision and evaluation of instruction and recognition of teachers for their superior performance when added to the model does improve upon our ability to predict the achievement of students in mathematics. Principal experience (\( \beta = .338 \)) continues to be the stronger predictor of achievement in mathematics, followed by school size (\( \beta = .304 \)), school level (\( \beta = .287 \)), principal tenure (\( \beta = .193 \)) and leadership (\( \beta = .115 \)). The increase in the beta for the leadership suggests that the principal’s focus on leadership behaviors associated with supervision of instruction and recognition of teachers tends to result in higher mathematics achievement than the principal’s focus on more general leadership behaviors.
Summary of Hierarchical Regression Analysis for Factor 2 Predicting Mathematics Achievement

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<td>B</td>
<td>SE B</td>
<td>β</td>
<td>B</td>
<td>SE B</td>
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<tr>
<td>#YRS Principal Tenure</td>
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<td>1.96</td>
<td>-.131*</td>
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<td>1.93</td>
<td>-.20*</td>
<td>-13.00</td>
<td>1.92</td>
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<tr>
<td>#YRS Principal Experience</td>
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<td>1.35</td>
<td>.34*</td>
<td>15.50</td>
<td>1.34</td>
</tr>
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<td>.29*</td>
<td>19.00</td>
<td>2.14</td>
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<td>-.31*</td>
<td>-21.49</td>
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<td>.12*</td>
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</tr>
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</table>

\( R^2 \)

<table>
<thead>
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<th>.15*</th>
<th>.17*</th>
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</thead>
<tbody>
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<td>47.47</td>
</tr>
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<td>( \Delta R^2 )</td>
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<td>.01*</td>
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<tr>
<td>( \Delta F )</td>
<td>48.46</td>
<td>54.73</td>
<td>19.09</td>
</tr>
</tbody>
</table>

* \( p \geq .05 \).

Influence of Protecting of Instructional Time and Using Data on Mathematics Achievement

The influence of leadership behaviors associated with protecting instructional time and using data to recognize students and teachers for superior work or improvement on the dependent variable of student mathematics achievement was examined in the third regression (see Table 19). Model 1 and Model 2 demonstrated the same results as described in the previous regression. In Model 3, the addition of the scale focused on leadership behaviors in protecting instruction time and use of data to monitor student achievement and teacher performance to a model which retains the principal characteristics (length of principal tenure and amount of principal experience) and the school characteristics (school level and school size) explains 15.7% of the variance in mathematics achievement. The model is significant with \( p = .000, F = 44.797, df = 5, 1204 \). Addition of a scale focused on leadership behaviors associated with protecting instructional time and using data to recognize students and teachers for superior work or
improvement accounts for .5% of variance in mathematics achievement. The change is significant with a $\Delta p = .005$, $p \leq .05$, $F = 7.759$, $df = 5, 1204$. Thus, the scale of leadership associated with protecting instructional time and using data to recognize students and teachers for superior work or improvement when added to the model does improve upon our ability to predict the achievement of students in mathematics. Principal experience ($\beta = .336$) continues to be the stronger predictor of achievement in mathematics, followed by school size ($\beta = .307$), school level ($\beta = .294$), principal tenure ($\beta = .195$) and leadership ($\beta = .074$). The smaller beta size for leadership from the regressions with Factor 1 and 2 suggests that the principal’s focus on leadership behaviors associated with protecting instructional time and using data to recognize students and teachers for superior work or improvement tends not to have as much influence on higher mathematics achievement than a principal’s focus on more general leadership behaviors (Factor 1) or a principal’s focus on leadership behaviors associated with supervision of instruction and recognition of teachers (Factor 2).
Table 19

*Summary of Hierarchical Regression Analysis for Factor 3 Predicting Mathematics Achievement*

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<td>-.20*</td>
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<td>-.31*</td>
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</tr>
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<td>.12</td>
<td>.07*</td>
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<td></td>
</tr>
</tbody>
</table>

| R²                        | .07*    | .15*     | .16*     |
| F                         | 48.46   | 53.76    | 44.80    |
| ΔR²                       | .07*    | .08*     | .01*     |
| ΔF                        | 48.46   | 54.73    | 7.76     |

* p ≥ .05.

**Influence of Maintaining High Visibility and Recognizing Teacher Effort on Mathematics Achievement**

The influence of leadership behaviors associated with maintaining high visibility that supports the building of relationships and complementing teachers personally on their efforts or performance on the dependent variable of student mathematics achievement was examined in the second regression (see Table 20). Model 1 and Model 2 demonstrated the same results as described in the previous regression. In Model 3, the addition of a scale focused on leadership behaviors associated with maintaining high visibility that supports the building of relationships to a model which retains the principal characteristics (length of principal tenure and amount of principal experience) and the school characteristics (school level and school size) explains 17.1% of the variance in mathematics achievement. The model is significant with $p = .000$, $F = 49.668$, $df = 5$, 1204. Addition of a scale focused on leadership behaviors associated
with maintaining high visibility that supports the building of relationships accounts for 2% of variance in mathematics achievement. The change is significant with a Δp=.000, p ≤.05, F = 28.425, df = 5, 1204. Thus, the scale of leadership associated with maintaining high visibility that supports the building of relationships when added to the model does improve upon our ability to predict the achievement of students in mathematics. Principal experience (β = .327) continues to be the stronger predictor of achievement in mathematics, followed by school size (β = .297), school level (β = .274), principal tenure (β = .181) and leadership (β = .141). The greater beta for size for leadership represented in Factor 4 over the leadership beta in previous regression models suggests that the principal’s focus on leadership behaviors associated maintaining high visibility that supports the building of relationships and complementing teachers personally on their efforts or performance tends to have greater influence on higher mathematics achievement than a principal’s focus on more general leadership behaviors (Factor 1), leadership behaviors associated with supervision of instruction and recognition of teachers (Factor 2) and leadership behaviors associated with protecting instructional time and using data to recognize students and teachers for superior work or improvement (Factor 3).
Table 20

Summary of Hierarchical Regression Analysis for Factor 4 Predicting Mathematics Achievement

<table>
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<tr>
<th>Variables</th>
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<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
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<td>SE B</td>
<td>β</td>
</tr>
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<td>1.96</td>
<td>-.131*</td>
</tr>
<tr>
<td>#YRS Principal Experience</td>
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<td>1.34</td>
<td>.283*</td>
</tr>
<tr>
<td>School Levels</td>
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<td>2.15</td>
<td>.29*</td>
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</tr>
<tr>
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<td>.14*</td>
</tr>
</tbody>
</table>

R²                   | .07* | .15*  | .17* |
F                    | 48.46| 53.76 | 49.67|
ΔR²                  | .07* | .08*  | .02* |
ΔF                   | 48.46| 54.73 | 28.43|

* p ≥ .05.

Influence of Predictor Variables on English/Reading and Mathematics Student Achievement

With regards to the predictor variables, principal tenure and principal experience were significant in each of the 4 linear regressions for mathematics. Based on the negative beta, schools in which the principal has been tenured for a longer time tend to have lower student outcomes in mathematics performance than schools with shorter tenured principals. Schools led by more experienced principals have greater student achievement in mathematics than those schools with less experienced principals. Schools with upper grade levels tend to have greater student achievement in mathematics than schools with lower grade levels. Based on the negative beta, schools with smaller student populations tend to have stronger performance in mathematics than schools with larger student populations.
Summary

The purpose of this study was to understand the relationship between principal leadership and student achievement in English/Reading and in mathematics. Lowest performing schools in one state provided the context for study’s examination of the influence of leadership on student achievement in an effort to determine if there were specific leadership behaviors that had a greater impact on improving student achievement outcomes. This study explored the relationship between leadership and student achievement while controlling for antecedent variables of principal tenure and experience and school level and size, which have been found to influence student achievement in low performing schools.

The first part of this chapter provided an analysis of the following variables: teacher responses to the PIMRS, student achievement, school level and size and principal tenure and experience. Results indicated that based on teacher perceptions of principal leadership behavior, certain leadership functions were more frequently exhibited by principals, including: Function 1: Frame the School Goals; Function 2: Communicated the School Goals, Function 4: Coordinate the Curriculum and Function 9: Promote Professional Development.

In order to address the null hypotheses for Research Question 1 and 2, a series of hierarchical regressions were run with 4 different factors in which each measured a different set of leadership behaviors to determine the influence of the different sets of leadership behaviors on student achievement. For Research Question 1, the null hypothesis failed to be rejected. The addition of the different set of principal leadership behaviors in Model 3 for all 4 regressions was not significant, thus the addition of leadership behavior to a model that retained principal tenure, principal experience, school level and school size does not substantially improve our ability to predict the achievement of students in English/Reading.
For Research Question 2, the null hypothesis was rejected. The addition of each set of different leadership behaviors measured by Factor 1, Factor 2, Factor 3 and Factor 4 to a model that retained principal tenure, principal experience, school level and school size does improve upon our ability to predict the achievement of students in mathematics. Each set of leadership behaviors was significant and resulted in a change in variance in mathematics achievement as follows: (Factor 1) a general scale of leadership behaviors, 1%; (Factor 2) leadership behaviors associated with supervision and evaluation of instruction and recognition of teachers for their superior performance, 1%; (Factor 3) leadership behaviors associated with protecting instructional time and using data to recognize students and teachers for superior work or improvement, 1% and (Factor 4) leadership behaviors associated maintaining high visibility that supports the building of relationships, 2%. Although these are modest amounts of variance, leadership does influence student achievement in mathematics and has an impact beyond principal tenure, principal experience, school level and school size.

Examination of the influence of predictor variables on the relationship between leadership and student achievement revealed that the relationship of tenure, experience, school level and school size was significant. The strongest predictor of student achievement in English/reading was school size with smaller size schools yielding greater student achievement when compared to larger schools. The most important predictor of student achievement in mathematics was principal experience, followed by school size. Schools with principals that had more experience as a principal tended to have greater student achievement in mathematics and smaller schools tended to have greater student achievement in mathematics. The amount of variance explained by leadership behaviors under study, tenure, experience, school level and school size leaves much of the variance in student achievement unaccounted for.
CHAPTER 5
FINDINGS, CONCLUSIONS AND IMPLICATIONS

Introduction

The momentum in this quest to identify specific leadership behaviors that improve student academic outcomes in the context of lowest performing schools was driven by the desire to provide principals a set of actions on which to focus their attention. Leadership in low performing schools is unappealing due to the complexity of leading a low performing school and the accompanying high stakes accountability, yet these are the schools that need effective leaders the most. The inability of federal policy-makers to improve outcomes in chronically low performing schools based on the lack of overall results from the required SIG grant implementation (Dragoset, L., Thomas, J., Herrmann, M., Deke, J., James-Burdumy, S., . . . , 2017) calls for the field to identify a set of skills and knowledge for effective leadership in this context that is aligned with research to meet the needs of students in the most challenged schools. The principal’s focus on instruction and learning has been found to be more important for improving school performance than the [school improvement] models used (Berends (2002), as cited in Fullan (2007), p. 102) and this study sought to identify specific behaviors on which principals should focus.

This chapter will 1) restate the purpose of the study, 2) describe the findings in the context of associated research, 3) identify implications for policy and practitioners, and 4) suggest recommendations for further research, and 5) discuss conclusions drawn.

Findings

The purpose of this study was to understand the relationship between teacher perceptions of instructional leadership behaviors and student achievement in English/Reading and in mathematics in low performing schools. Grouping of schools for the purposes of required
anonymity led to the identification and inclusion the research-based predictor variables of principal characteristics (tenure and experience) and school structures (level and size) which have been shown to influence the relationship between leadership and student achievement, especially in low performing schools.

**Principal Leadership**

For Research Question 1, the researcher sought to determine the relationship between leadership and achievement in English/Reading when principal characteristics (tenure and experience) or school characteristics (level and size) are accounted for. In examining the relationship between the 4 different sets of leadership behaviors on student achievement in English/Reading, the study found no significant relationship between leadership and student achievement in English/Reading. One explanation is that English test scores have been found to be less sensitive to principals’ actions than math test scores (Clark et al., 2009).

For Research Question 2, the researcher sought to determine the relationship between leadership and achievement in mathematics when principal characteristics (tenure and experience) or school characteristics (level and size) are accounted for. Leadership was found to be a significant predictor of achievement in mathematics. Research supports that the effects of leadership may be reflected more strongly in mathematics than English/Reading achievement. Mathematics achievement has been found to be more sensitive to the actions of principals than English/Reading achievement (Clark et al., 2009). With regards to the principal’s leadership role in the oversight of teaching and learning, teacher effectiveness appears to have a greater influence on mathematics achievement than English/reading based on the STAR study that found teacher effectiveness to impact reading by about one third of a standard deviation and math by almost half a standard deviation (Nye, et al., 2004) and high poverty students benefited the most.
from an effective teacher. While significant, the amount of leadership influence on mathematics achievement may have been undercut by the rapid succession of principals in this study which has been shown to result lower achievement specifically in mathematics in the first year (Beteille, et al., 2011).

Leadership mattered in relationship to mathematics achievement across all four sets of leadership behaviors analyzed. The greatest influence appeared to be from those principal leadership behaviors associated with the principal’s high visibility that support the building of relationships among teachers and students and complimenting teachers personally on their efforts or performance. Principals exhibiting these types of behavior would be seen frequently taking time to informally talk with teachers and students, visiting classrooms to discuss school issues with teachers and students and attending extra- and co-curricular activities. Based on descriptive analyses, principals in this study were least frequently observed engaged in behaviors associated with talking with teachers and students and attending/participating in co- and extra- curricular activities. Principal’s visibility, quality contact and interactions with teachers and students, has been found to have a .16 correlation with student achievement (Waters et al., 2003). The broader cultural practices associated with this dimension align with the transformational leadership model supported by Leithwood et al. (2004) in building upon relationships within the organization. The principal’s focus on visibility and ongoing interaction with students and teachers aligns with Hoy’s (2012) findings that “academic optimism (a latent construct consisting of academic optimism, collective trust in parents and students, and collective efficacy) as strong a predictor of achievement as socio-economic status.”

The next strongest set of principal leadership behaviors was associated with supervision and evaluation of instruction. A principal exhibiting these types of behaviors would be involved
in frequent informal observations and feedback on strengths to ensure classroom priorities align
with school goals, to include the principal’s review of student work. Additionally, the principal
would frequently recognize, formally and informally, teachers’ superior performance and
improvement and provide incentives (e.g., professional growth opportunities). Research strongly
supports the involvement of the principal in the technical core to improve student outcomes.
Instructional leadership has been found to be key to improving outcomes as demonstrated by the
strong positive and significant correlation (r=.49) found between alignment of instructional
content and student gains (Porter et al., 1994 as cited in Squires, 2012). The Wallace Foundation
(2012) identified improving instruction as one of the five key areas of principals’ responsibility
characteristic of effective principals tied to improved student achievement and Barber &
Mourshed (2007) found while top strong improvers of educational systems hired more talented
teachers, they also developed these teachers and effectively ensured that the best instruction was
consistently delivered to each and every student. Collective teacher efficacy has an effect size of
1.57 on student achievement (Hattie, 2012). From a teacher’s efficacy perspective, principals
spending time in classrooms demonstrates to teachers that the principal understands students and
conditions under which they teach (Louis et al., 2010). Robinson et al. (2008) found a .42
correlation with student achievement when the principal is directly involved in the oversight of
curriculum through planning and coordinating the curriculum, coupled with evaluating teaching.
Additionally, the importance of teacher effectiveness ties directly back to the effect of effective
teachers on student achievement in the STAR study which found that “the difference in
achievement gains between having a 25th percentile teacher (a not so effective teacher) and a
75th percentile teacher (an effective teacher) is almost half a standard deviation (0.48) in
mathematics,” with high poverty students benefiting the most from an effective teacher (Nye, et
al., 2004, p. 253). Based on descriptive analyses, principals in this study were observed most frequently engaged in behaviors associated with the oversight and coordination of the curriculum, but not the supervision and evaluation of instruction. Additionally, principals were least frequently observed recognizing teachers for their efforts or performance with opportunities for professional growth or professional recognition. Monitoring the curriculum and alignment may be approached from a basic leadership level, however, the evaluation and feedback associated with supervision and evaluation requires leaders to engage in leadership at a higher level.

The third strongest set of principal leadership behavior was associated with a general scale of leadership behaviors. Waters, et al. (2003) found an effect size of .25 on student achievement based on improvement in all 21 of the identified principal leadership responsibilities by one standard deviation. Leadership’s influence was confirmed to be second only to classroom instruction among all school-related factors that contribute to what students learn at school with the total direct and indirect effects of leadership accounting for about a quarter of total school effects (Hallinger & Heck, 1996; Leithwood & Jantzi, 2000, as cited in Leithwood et al., 2004, p. 5). Effects of leadership are even greater in struggling schools (Leithwood, et al., 2004). Studies continue to acknowledge its impact on student achievement with indirect effects of total leadership on student achievement found to account for 27% of the variation in student achievement across schools (Leithwood, et al. 2008, p. 34).

The least strongest influence on achievement was the set of leadership behaviors associated with ensuring that instructional time is protected and using data. Principals exhibiting these types of behavior would ensure the instructional time was free from interruption and students are present for instruction. They would use data for purposes of recognizing superior
work of students and staff, to monitor progress towards school goals, and to identify curricular strengths and weaknesses. Protection of instructional time also entails principal behavior associated with ensuring students are in attendance for instruction. The effects of absenteeism have been found to correlate with lower testing performance on state exams (Goodman, 2014; Gottfried, 2009, 2010, 2011b; Moonie, Sterling, Figgs & Castro, 2008 as cited in Gottfried, 2017). Absences are missed opportunities for learning, resulting in fewer opportunities for students to practice and be supported in learning content or skills which would result in lower performance. Gottfried (2009, 2011b as cited in Gottfried, 2017) linked early absenteeism directly to lower standardized reading and math state exams for elementary school children. Research supports the protection of instructional time with Robinson et al. (2008) finding that leadership practices associated with ensuring an orderly supportive environment to have an effect size of \( r = .27 \) on student achievement and Waters et al. (2003) finding a .24 correlation between student achievement and the extent to which principals protected instructional time from interruptions and protected/sheltered teachers from distractions.

The use of data to monitor student progress supports program evaluation, modifications to the school’s instructional and design and intervention supports, and progress monitoring for teachers and students. Cotton (2003) asserted the importance of being accountable for continuous improvements through progress monitoring and use of student progress data to inform programs. The principal’s role in must include ensuring a structure and process for monitoring progress towards the school’s goals as well as the impact of the curriculum on student learning (Knapp et al., 2006; Leithwood et al., 2004; WestEd, 2002). Higher performing schools use teacher and student data to make informed decisions (Fullan et al., 2006; Public Impact, 2008). The Wallace Foundation (2013) identified the managing of people, data and processes as one of the five key
characteristics of effective leader for school improvement. The use of data to support systemic and fair recognition and celebration of accomplishments for teachers and students was found to have a .25 correlation with student achievement (Waters et al., 2003). At the classroom level, the use of data is important for monitoring student progress, identifying struggling students, and providing intervention (Duke, 2010), but also for recognizing student success and improvements.

With regard to the frequency of leadership behaviors, Hallinger & Chen (2015) note the PIMRS can be used to effectively analyze the patterns in the instructional leadership of principals. Analysis of the descriptive data did provide the researcher with insight into patterns of principal leadership behaviors that contribute to the findings of this study. Principal leadership behaviors most frequently observed by teachers across schools included: Function 1: Frame School Goals, Function 2: Communicates School Goals, Function 4: Coordinate the Curriculum, and Function 9: Promote Professional Development. The least frequently observed leadership behaviors were in Function 7: Maintain High Visibility and Function 8: Provide Incentives for Teachers.

While almost all successful leaders draw on the same repertoire of basic leadership practices that include building vision, setting directions, understanding and developing people and managing the teaching and learning program, it is the way in which leaders apply these basic leadership practices – not the practices themselves (Leithwood et al., 2008). The frequency of leadership behaviors identified by this study align with the focus of the VDOE Office of School Improvement training delivered to the state’s low performing school leaders: establishing measurable academic goals with input from stakeholders, communication of those goals, and feedback to teachers on the alignment of the written, taught and tested curriculum. Additionally, all VDOE training used a train-the-trainer model with expectations that the administrators
replicate sessions at the school level which drove ongoing professional development delivery and its topics at the school level. Principals tended to be observed most frequently engaged in activities that were aligned to the VDOE training. Although principals were frequently observed as being engaged with the VDOE training content, it is unclear whether the engagement was at the level of first order change (compliance-oriented), or at the level of second order change. The constant turnover in principals within the schools may have impeded application beyond simple compliance.

**Principal Characteristics and School Characteristics**

With regard to principal experience, the study found schools led by principals with more experience as a principal tended to have greater student achievement in English/reading and in mathematics than schools led by principals with less experience as a principal. Although principal experience was identified as a predictor of English/reading achievement, experience was the weakest predictor of achievement among school level, principal tenure and school size. However, principal experience was a stronger predictor of mathematics achievement than school size, school level, principal tenure or leadership. Findings in this study related to principal experience concur with the research that principals become more effective as they gain experience, especially in their first 3 years (Clark et al., 2009; Louis et al., 2010).

With regard to tenure, schools in which the principal was tenured longer in the building tended to have lower student achievement in English/reading and in mathematics than schools with principals having shorter tenure. This finding is contrary to research that purports the stability of leadership for four or more years as being critical to fully developing school-level processes, stabilizing staff, and fully implementing policies and practices to increase student achievement (Heck & Hallinger, 2009; Louis et al., 2010). Frequent turnover of principals has
been found to result in negative effects on initiatives relating to improving student outcomes, especially in low performing schools (Beteille et al., 2011; Branch et al., 2012; Ronfeldt et al., 2013). Eighty-six percent (29) of the principals in this study reported tenure in the building between 1 and 4 years and 30% (11) of these principals were new to their school. Nineteen percent (7) principals had led their building for five or more years. With regards to greater tenure and low performance, research provides that average academic performance stalls after the principal’s fifth year (Miller, 2013). Results may be reflective of principal effectiveness, as highly effective principals have been found to raise the achievement of a typical student in their school by between two and seven months of learning in a single school year, while ineffective principals can lower achievement by the same amount (Branch et al., 2013).

With regard to school level, high schools tended to have higher student achievement in English/reading and in mathematics when compared to elementary schools and middle schools. These findings contrast with research evidencing lower achievement at the high school level due to the increase in gaps of student knowledge and skills as students progress from elementary to middle to high school, requiring more complicated and challenging remediation (Kutash et al., 2010). Also, high schools tend to be larger and present more complex challenges to leadership’s direct oversight of the instructional program and afford fewer connections among teachers and between teachers and students (Leithwood et al., 2004; Louis et. al., 2010). With regards to student achievement and multiple transitions, student achievement declines with each transition and the greatest declines in achievement occur with the transition to middle school grades (Rockwood & Lockwood, 2010; Schwerdt & West, 2012). One reason for higher performance of high schools in this study may be that at the time of this study high school students were allowed
retakes for end of course assessments in English/Reading and mathematics, whereas lower grade levels took a one-time assessment.

With regard to size, smaller schools were characterized by greater student performance in English/reading and in mathematics when compared to larger schools. Smaller size schools across elementary and secondary levels were found to be a contributing factor to school success in raising achievement (Lee & Loeb, 2000; Voight et al., 2013). Smaller schools support easier oversight of curriculum and instruction and opportunities for connections among teachers, between teachers and students (Louis et al., 2010; Rennie Center, 2005). This study found smaller schools were a stronger predictor of English/reading achievement than school level, principal experience and principal tenure. School size was the second strongest predictor of mathematics student achievement.

Limitations

The researcher faced multiple challenges in attempting to provide evidence of key leadership behaviors that support increased student achievement in the context of low-performing schools to include: changing state standards and assessments during the study which impacted straightforward comparison of the student achievement; high principal turnover within the population; lack of adherence to VDOE requirements for the administration of the PIMRS; required anonymity of schools and principals; and limited number of categorical, or variable, analysis available that could be protected with anonymity.

Implications

The $3 billion in SIG grants that poured into the lowest performing schools netted little in terms of student outcomes. In a comprehensive study across 20 states using a regression discontinuity design analysis no significant impacts of SIG-funded models on student outcomes
Estimates were not significant with student-level effect sizes of 0.01 standard deviations in math and 0.08 standard deviations in reading (Dragoset, et al., 2017, p. 84). Using a less rigorous method, multivariate regression models, and only 11 SIG schools and 72 comparison schools in the Philadelphia area found grade-level effect sizes of 1.11 standard deviations in math and 0.83 standard deviations in reading. The pathway to improved student achievement in the lowest performing schools remains unclear.

National, state and district accountability for improving student learning rests on the shoulders of the school principal. Although the link between leadership and student learning is well documented, there is a lack of research on the influence of principal leadership on student achievement focused in the lowest performing schools. Based on the lack of research and a body of knowledge associated with principal leadership in this context, the researcher conducted this study to examine the leadership behaviors of principals in low-performing schools by comparing teacher perceptions of the frequency of instructional leadership behaviors exhibited by principals to the change in student achievement in the 36 lowest-performing Title I schools in Virginia. Identification of specific leadership topics in the context of the lowest performing schools can inform federal turnaround policy for SIG requirements and state support training topics.

As previously stated in the literature review, key studies from the turn of the millennium have identified the indirect contribution of leadership to student achievement, with the effects being greater in struggling schools. The number of chronically low-performing schools have increased and there have been few instances of success with federally-mandated intervention programs in turning these schools around. Understanding the specific contributions of leadership to learning can support principal preparation programs, state and district leadership training,
inform district principal hiring practices for struggling schools, and provide a focus for seated principals to improve student achievement. Identification of key principal leadership behaviors that support improvement in low-performing schools will inform more effective federal and state interventions and a targeted use for the millions of federal school improvement dollars.

The implementation of the NCLB accountability requirements remains intact with the recent amendment to ESEA, the Every Student Succeeds Act (Federal Registrar, Pub. L. No 114-95 §114 Stat. 1177 (2015-2016)). Virginia’s ESEA Flexibility Request (VDOE, 2013) required identification and implementation of an intervention model in the state’s lowest performing 5% of Title I schools. Four 3-year intervention models required the school to be closed or the principal to be replaced if the principal had been leading the school for 2 or more years. Under federal regulatory pressure to implement principal and teacher evaluation models to retain federal funding, state level accountability for student achievement was leveraged through Virginia legislation providing that 40% of principal evaluation be based on measures of student achievement. In addition, the continued national, state and district pressure on principals in low-performing schools to increase student achievement, prompted by the United States’ drop in PISA ranking in mathematics and reading, induced the search to identify leadership practices that result in improved student achievement with a focus on turning around the nation’s lowest performing schools.

Trend data demonstrates a rise in the number of schools “failing” to meet federal requirements (Usher, 2012; VDOE, 2011), frequent principal turnover (Beteille, et al., 2011; Ronfeldt, et al., 2013), and fewer principals willing to take on and stick with meeting the challenges in low-performing schools (OECD, 2008; Dipaolo & Tschannen-Moran, 2003). The impact of principal leadership and the increased impact of effective in leadership in low-
performing schools on student achievement is well documented; however, there is little evidence identifying specific leadership behaviors that support improved achievement in the context of the lowest performing schools. Turning around the bottom 5% of schools represents our nation’s greatest challenge and opportunity to remain globally competitive. Identification of factors that contribute to success in low-performing schools is difficult to determine due to confounding factors in educational organizations, as well as the schools’ status as statistical outliers (Stuit, 2010). While research on school improvement has focused on identifying conditions for increasing student achievement, few studies have focused on specific practices of leaders that impact achievement (Leithwood et al., 2004; Robinson et al., 2008) in the context of low-performing schools. Principals’ focus on instruction and learning has been found to be more important for improving school performance than the [school improvement] models used (Berends (2002), as cited in Fullan (2007), p. 102) and current research has not “found a single case of a school improving its student achievement record in the absence of talented leadership (Leithwood et al., 2010, p. 9).”

**Recommendations for Policy and Practice**

Based on the findings of this study and associated research, recommendations for policy include:

1. Federal and state policy should align requirements for principal replacement in low performing schools with research that purports the negative effect of principal turnover on student achievement.

2. State departments should develop a policy that establishes a process with multiple measures and trend data that districts can use to consider if a tenured principal should be replaced or a co-principal assigned when a school becomes identified as low performing.
This data should be used to inform differentiated professional development from the district, as well as the state to support the school leader.

3. State departments and low performing school districts should use research and local data to craft job descriptions for low performing school principals that guide selection of candidates who have the knowledge, skills and experience to lead in a challenged school.

4. States and district policy should address class size for low performing schools and incentivize expansion of class size reduction beyond K-3 to support improved achievement through middle school.

5. Principal preparation programs should work with state and district leaders and school improvement specialists to insure leadership preparation programs include coursework in instructional leadership and experiences that are closely tied to research on behaviors linked to student achievement, especially those determined to be effective in the lowest-performing schools. Theory should be augmented through applied field experiences.

Based on the findings of this study and associated research, recommendations for practice include:

1. Local districts should implement a hands-on internship for principals expressing interest in taking on the challenge of a low performing school to better understand the external mandates and implementation of turnaround. The internship could take the structure of a co-principal model.

2. Superintendents and local boards should incentivize principals whose schools are demonstrating progress in student achievement and other measures of leadership (i.e., teacher retention, graduation rate, career tech certifications, parent/student satisfaction).
3. Districts should consider schools with K-8 structures when investing in new construction and explore use of existing structures to support grade configurations that minimize transitions and achievement loss. Consider the school within a school model to address the most subgroups that are the most challenged.

4. Districts should develop and implement a monitoring and feedback system that uses multiple measures for principals of low performing schools that supports short- and long-term goal setting, generates data on progress during the school year and informs differentiated support.

5. Closely examine the delivery of successful remediation and incorporate effective practices in the regular classroom throughout the year to reduce the need for test retakes.

**Suggestions for Future Research**

Future research in identifying the effective leadership behaviors that contribute to increased student learning is important in the context of the lowest-performing and chronically low-performing schools in our nation. The purpose of this study was to understand the relationship between teacher perceptions of instructional leadership behaviors and student achievement in English/Reading and in mathematics in low performing schools. The researcher sought to identify specific leadership behaviors or conditions that have the greatest impact on improving student achievement in the most challenged schools to provide principals and districts a few key practices on which to focus their efforts in setting the stage for continuous improvement. In the literature review, key studies documented the effect of leadership on student achievement; however, acknowledged the lack of evidence relative to the specific leadership behaviors that have the greatest influence in the context of low-performing schools. In the population studied, no significant correlation was identified between principals’ instructional
leadership behaviors as measured by the PIMRS and student achievement in English/Reading. However, a significant relationship between leadership and student achievement in mathematics was found. The effects of leadership in low-performing schools are great and mathematics may be the most sensitive to the influence of leadership (Clark et al., 2009), as well as impacted by principal experience (Beteille, et al., 2011).

Results from this study may with regards to the specific dimensions of behaviors, or groups of behaviors, will inform professional development topics for state support, provide a focus for effectively leading in low-performing schools, and principal preparation for leading in low-performing schools. Based on the results, mathematics achievement tends to be higher when leaders in low performing schools focus on maintaining visibility and recognizing the efforts or performance of teachers personally. Additionally, a deeper investment in evaluation and supervision of instruction with teacher incentives for superior effort seems to yield better student outcomes in mathematics. General leadership behaviors measured by the PIMRS are associated with effective principals and improved scores (Leithwood et al., 2004; Robinson et al., 2008; Wallace Foundation, 2013; Waters et al., 2003) and were found to be a significant influence on student achievement in mathematics when incorporated in a general scale of leadership behaviors in this study. Finally, a group of specific leadership behaviors associated with the protection of instructional time and use of data to measure school progress, discuss student progress and identify strengths and weaknesses in the curriculum were found to significantly influence student achievement in mathematics.

In addition, the researcher identified findings with regard to variables that influence the relationship between principal instructional leadership and student achievement in the lowest performing schools. In examining the influence of principal demographics, school structures and
principal leadership behavior on student achievement, 13% of the variance in English/Reading achievement was predicted by principal tenure, principal experience, school level and school size which leaves 87% of the variance unexplained. School size was a stronger predictor of student achievement in English/Reading followed by school level, principal tenure or principal experience. The addition of PIMRS Item 1, the leadership variable, to the model was not significant. When the influence of principal demographics, school structures and principal leadership behavior on student achievement in mathematics was examined, 17.9% of the variance was predicted by principal tenure, principal experience, school level, school size and leadership behavior. This leaves 82% of the variance unexplained. Principal experience was the stronger predictor of student achievement in mathematics followed by school size, school level, principal tenure and PIMRS Item 1 (leadership measure).

Recommendations for future research are as follows:

1. Replicate this study with schools at different performance levels. Exploration of the leadership behaviors at different performance levels will determine whether there are unique variables that interact with the relationship between leadership and student achievement at the different performance levels (e.g., influences of external pressure and accountability on low-performing schools to improve).

2. Further explore why the relationship between principal leadership and student achievement is greater in mathematics than in English/Reading.

3. Conduct a study to explore the influence of state-mandated professional development topics on principal leadership behaviors and student achievement outcomes. In this study, an evaluation of samples of principals’ written feedback on the written, taught and tested curriculum may have further explained the relationship between PIMRS
functions and student achievement. Following up on fidelity of implementation of expectations relative to professional development may inform more efficient and effective expenditure of federal funds available to support low performing schools at the state, district and school level.

4. Conduct a qualitative study to explore the congruence of principal and teacher perspectives of leadership to understand how the relationship may influence teacher efficacy. Understanding the leadership behaviors that build teacher efficacy will inform the principal’s focus and support improved student achievement.

5. Conduct a mixed methods model that uses quantitative and qualitative data to examine if the leadership behaviors undertake and maintain change on a first or second order level to understand the impact of different change order levels on student achievement. Compliance is often implemented and maintained on a first order level with a checklist mentality.

6. Replicate this study using a model that incorporates a measure of classroom effectiveness, as the effect of leadership on student achievement has been found to be mediated by classroom instruction. School improvement leadership is a process of mutual influence and reciprocal processes (Hallinger & Heck, 2011).
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Appendix A

Office of School Improvement
Virginia Department of Education
101 N. 14th Street
Richmond, VA 23218

Dear Dr. Smith,

As a doctoral student at Seton Hall University, I would like to request permission to use data collected by the Virginia Department of Education’s Office of School Improvement that was previously used for my action learning project for an Office of School Improvement –sponsored principal leadership training program. This study will explore three overarching dimensions and ten leadership functions, measured by the Principal Instructional Leadership Management Rating Scale (PIMRS), in relation to student achievement. Furthermore, the study will investigate the possible differences in principal instructional leadership behavior in higher achieving low-performing schools, as compared to lower achieving schools. In addition, this study will examine the impact of principal instructional leadership behaviors when combined with the principal demographic antecedent variables (gender, retention, principal experience) and contextual antecedent variables (division locale description, schools size and school level).

The request for data includes results of the PIMRS for 2011-2012 and 2012-2013 as well as student achievement data for 2011-2012 and 2012-2013 to be represented as an estimated school mean scale score of the state Standards of Learning reading or mathematics assessment taken by the most students in the school. If permission is granted, anonymity for schools will be ensured by coding and aggregation of data. All will be recorded anonymously and identifying information deleted at the end of the study. The coding system will be used protect subjects’ identity.

I look forward to your response.

Sincerely,

Janice Garland

Continued
From: Smith, Kathleen (DOE)  
Sent: Wednesday, June 11, 2014 4:23 PM  
To: Garland, Janice (DOE)  
Subject: RE: Request for Use of Data

Permission is granted for the request for data for the results of the PIMRS for 2011-2012 and 2012-2013 as well as student achievement data for 2011-2012 and 2012-2013 to be represented as an estimated school mean scale score of the state Standards of Learning reading or mathematics assessment taken by the most students in the school. Please ensure that anonymity for schools will be ensured by coding and aggregation of data.

Thanks

Dr. Kathleen M. Smith, Director  
Office of School Improvement  
Telephone: (804) 786-5819  
Cell: (804) 334-6614  
Kathleen.Smith@doe.virginia.gov

From: Garland, Janice (DOE)  
Sent: Wednesday, June 04, 2014 11:10 AM  
To: Smith, Kathleen (DOE)  
Subject: Request for Use of Data

Please find attached my request for permission to use applicable data for my dissertation at Seton Hall University. I look forward to hearing from you.

Janice E. Garland, Lead School Improvement Coordinator  
Office of School Improvement  
Virginia Department of Education  
101 N. 14th Street, P.O. Box 2120  
Richmond, VA 23218-2120  
Phone (804)371-6201  Fax (804)786-9763  
Email: Janice.Garland@doe.virginia.gov
**Figure B1. Sample Principal Instructional Measurement Rating Scale: Framing the School Goals**

**FRAME THE SCHOOL GOALS**

<table>
<thead>
<tr>
<th>To what extent does your principal . . .?</th>
<th>1 Almost Never</th>
<th>2 Seldom</th>
<th>3 Sometimes</th>
<th>4 Frequently</th>
<th>5 Always</th>
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<tbody>
<tr>
<td>1. Develop a focused set of annual school-wide goals</td>
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<td>○</td>
<td>○</td>
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<td>2. Frame the school’s goals in terms of staff responsibilities for meeting them</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>3. Use needs assessment or other systematic methods to secure staff input on goal development</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. Use data on student academic performance when developing the school’s academic goals</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5. Develop goals that are easily translated into classroom objectives by teachers</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
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</table>

Appendix C

Table C1

Meta-Analysis of PIMRS Teacher Reliability by Cultural Context and School Level

<table>
<thead>
<tr>
<th>Number</th>
<th>Author(s)</th>
<th>Nation</th>
<th>School Level</th>
<th>Incentives for Professional Development</th>
<th>Incentives for Learning Improvement</th>
<th>Cronbach’s reliability in extracted data sets</th>
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<tr>
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Summary statistics: 6,485, 682, 22 Rho hat 0.98, 0.90, 0.92, 0.94, 0.91, 0.89, 0.87, 0.89, 0.87, 0.82, 0.84, 0.90, 0.88, 0.87

Table C2

### Meta-Analysis of PIMRS Teacher Reliability by Cultural Context and School Level

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<th>Cross Content</th>
<th>Manage Instruction</th>
<th>Develop Climate</th>
<th>Frame Goals</th>
<th>Communicate Goals</th>
<th>Supervise Instruction</th>
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<th>Monitor Progress</th>
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<th>Incentives for Teachers</th>
<th>Professional Development</th>
<th>Incentives for Learners</th>
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### Cronbach’s Alpha Reliability: From Extracted Data

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Table D

_Missing Responses for PIMRS Teacher Form by Survey Item_

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Appendix E

Table E

**Reliability of PIMRS Teacher Form Responses: Missing Values Replaced**

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\(^a\) Listwise deletion based on all variables in the procedure.

**PIMRS Reliability Statistics**

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**Reliability by PIMRS Function**

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Appendix F

Table F

Comparison of Reliability Tests: Cronbach’s Alpha and Generalizability Test

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## Table G

*Content Validity Agreement Scores for PIMRS Subscales*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>*Reliability</th>
<th>Sample Size</th>
</tr>
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<tr>
<td>Frames Goals</td>
<td>6</td>
<td>91%</td>
</tr>
<tr>
<td>Communicates Goals</td>
<td>6</td>
<td>96%</td>
</tr>
<tr>
<td>Supervision/Evaluation</td>
<td>11</td>
<td>80%</td>
</tr>
<tr>
<td>Curricular Coordination</td>
<td>7</td>
<td>80%</td>
</tr>
<tr>
<td>Monitors Progress</td>
<td>8</td>
<td>88%</td>
</tr>
<tr>
<td>Protects Time</td>
<td>5</td>
<td>85%</td>
</tr>
<tr>
<td>Incentives for Teachers</td>
<td>4</td>
<td>100%</td>
</tr>
<tr>
<td>Professional Development</td>
<td>10</td>
<td>80%</td>
</tr>
<tr>
<td>Academic Standards</td>
<td>5</td>
<td>95%</td>
</tr>
<tr>
<td>Incentives for Learning</td>
<td>4</td>
<td>94%</td>
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</table>

### Appendix H

Table H

**Discriminant Validity Measures: Analysis of Variance by Subscale**

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<thead>
<tr>
<th>Subscale</th>
<th>F Value</th>
<th>Significance</th>
</tr>
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<tbody>
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<td>.0000</td>
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<td>.0000</td>
</tr>
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<td>.0266</td>
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<td>.0052</td>
</tr>
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<td>.0025</td>
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<td>Professional Development</td>
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<td>Academic Standards</td>
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<td>.0001</td>
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Variance in ratings of principals between schools at a significance level of 0.05

Principal Instructional Management Rating Scale Resource Manual (Hallinger, 2012)
### Table I

**PIMRS Function Subscale Intercorrelation Matrix**

<table>
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<tr>
<th></th>
<th>Frames School Goals</th>
<th>Communicates Goals</th>
<th>Evaluates Instruction</th>
<th>Coordinates Curriculum</th>
<th>Monitors Progress</th>
<th>Protects Instructional Time</th>
<th>Visibility</th>
<th>Incentives for Teachers</th>
<th>Professional Development</th>
<th>Academic Standards*</th>
<th>Incentives for Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frames School Goals</td>
<td>(.89)</td>
<td>.85</td>
<td>.47</td>
<td>.60</td>
<td>.54</td>
<td>.43</td>
<td>.39</td>
<td>.28</td>
<td>.45</td>
<td>.43</td>
<td>.46</td>
</tr>
<tr>
<td>Communicates Goals</td>
<td>(0.89)</td>
<td>.55</td>
<td>.71</td>
<td>.63</td>
<td>.49</td>
<td>.52</td>
<td>.41</td>
<td>.57</td>
<td>.54</td>
<td>.57</td>
<td></td>
</tr>
<tr>
<td>Evaluates Instruction</td>
<td>(.90)</td>
<td>.57</td>
<td>.65</td>
<td>.50</td>
<td>.60</td>
<td>.37</td>
<td>.69</td>
<td>.59</td>
<td>.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coordinates Curriculum</td>
<td>(.90)</td>
<td>.73</td>
<td>.52</td>
<td>.60</td>
<td>.43</td>
<td>.64</td>
<td>.53</td>
<td>.58</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Monitors Progress</td>
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<td>.57</td>
<td>.40</td>
<td>.67</td>
<td>.60</td>
<td>.49</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Protects Instructional Time</td>
<td>(.84)</td>
<td>.57</td>
<td>.37</td>
<td>.57</td>
<td>.65</td>
<td>.39</td>
<td></td>
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<td>.60</td>
<td>.57</td>
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<tr>
<td>Incentives for Teachers</td>
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<td>.53</td>
<td>.39</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Professional Development</td>
<td>(.86)</td>
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<td></td>
<td></td>
<td>.69</td>
<td>.57</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>(.83)</td>
<td>.54</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(.87)</td>
</tr>
</tbody>
</table>

*Note: All coefficients in parentheses are reliability estimates (Cronbach Alpha). Principal Instructional Management Rating Scale Resource Manual (Hallinger, 2012) *

*Academic Standards was removed from the PIMRS measurement tool prior to version used for this study.
Appendix J

Figure J. Build A Table Tool. Virginia Department of Education website data query tool. http://bi.virginia.gov/BuildATab/rdPage.asp
### Appendix K

Table K

**PIMRS Teacher Survey Return Rate**

<table>
<thead>
<tr>
<th>School*</th>
<th>Number of Surveys Removed</th>
<th>Percent Return Based on VDOE IPAL Report</th>
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<tr>
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<td>100%</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>47%</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>70%</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>48%</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>41%</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>71%</td>
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<tr>
<td>0</td>
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<tr>
<td>0</td>
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<td>3</td>
<td>19%</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>39%</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>61%</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>3</td>
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<tr>
<td>5</td>
<td>85%</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>73%</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>88%</td>
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</tr>
<tr>
<td>4</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>66%</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>37%</td>
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</tr>
<tr>
<td>2</td>
<td>63%</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>50%</td>
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</tr>
<tr>
<td>8</td>
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</tr>
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<td>6</td>
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<td>0</td>
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</tr>
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<td>5</td>
<td>60%</td>
<td></td>
</tr>
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<td><strong>NR</strong></td>
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<tr>
<td>10</td>
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<td>0</td>
<td>94%</td>
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</tr>
<tr>
<td>2</td>
<td>78%</td>
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<tr>
<td>42</td>
<td>34%</td>
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</tr>
<tr>
<td>4</td>
<td>93%</td>
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<tr>
<td>8</td>
<td>73%</td>
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</tr>
<tr>
<td>0</td>
<td>14%</td>
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</tr>
<tr>
<td>10</td>
<td>49%</td>
<td></td>
</tr>
</tbody>
</table>

Total 139

*School Code Removed. **NR=Not reported."
Appendix L

THE PRINCIPAL INSTRUCTIONAL MANAGEMENT
RATING SCALE

PART I: Please provide the following information if instructed to do so by the person administering the instrument:

Number of school years you have been principal at this school:

___ 1  ___ 5-9  ___ more than 15
___ 2-4  ___ 10-15

Years, at the end of this school year, that you have been a principal:

___ 1  ___ 5-9  ___ more than 15
___ 2-4  ___ 10-15

Figure L. Principal Instructional Management Rating Scale Principal, Part I. Hallinger, P. (1982).
Appendix M

Table M

Descriptive Data for English/Reading Student Achievement

<table>
<thead>
<tr>
<th></th>
<th>End of Course English</th>
<th>Grade 3 English/Reading</th>
<th>Grade 4 English/Reading</th>
<th>Grade 5 English/Reading</th>
<th>Grade 6 English/Reading</th>
<th>Grade 7 English/Reading</th>
<th>Grade 8 English/Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Min</td>
<td>Max</td>
<td>Mean</td>
<td>SD</td>
<td>N</td>
<td>Min</td>
</tr>
<tr>
<td>Average Sch Scaled SOL Score 2011-2012</td>
<td>10</td>
<td>395.89</td>
<td>475.08</td>
<td>452.64</td>
<td>26.49</td>
<td>13</td>
<td>377.36</td>
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<td>376.52</td>
<td>433.61</td>
<td>416.78</td>
<td>17.82</td>
<td>13</td>
<td>362.90</td>
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<td>491.29</td>
<td>491.29</td>
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<td>440.11</td>
<td>440.11</td>
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<td>-51.18</td>
<td>-51.18</td>
<td>0.00</td>
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<td>-40.81</td>
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<td></td>
<td>N</td>
<td>Min</td>
<td>Max</td>
<td>Mean</td>
<td>SD</td>
<td>N</td>
<td>Min</td>
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<td>Average Sch Scaled SOL Score 2011-2012</td>
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<td>475.78</td>
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<td>13</td>
<td>351.34</td>
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<td>335.27</td>
<td>424.44</td>
<td>387.02</td>
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<td>13</td>
<td>354.09</td>
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<td>481.12</td>
<td>481.12</td>
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<td>433.15</td>
<td>433.15</td>
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<td>-47.97</td>
<td>-47.97</td>
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<td>Min</td>
<td>Max</td>
<td>Mean</td>
<td>SD</td>
<td>N</td>
<td>Min</td>
</tr>
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<td>Average Sch Scaled SOL Score 2011-2012</td>
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<td>374.62</td>
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<td>29.24</td>
<td>16</td>
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<td>428.60</td>
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<td>437.56</td>
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<td>-46.91</td>
<td>-46.91</td>
<td>0.00</td>
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<td></td>
<td>N</td>
<td>Min</td>
<td>Max</td>
<td>Mean</td>
<td>SD</td>
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<td>Min</td>
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<td>396.64</td>
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<td>386.53</td>
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<td>486.64</td>
<td>486.64</td>
<td>0.00</td>
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<td>486.64</td>
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<td>428.26</td>
<td>428.26</td>
<td>0.00</td>
<td>16</td>
<td>-58.38</td>
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181
### Table N

**Descriptive Data for Mathematics Student Achievement**

<table>
<thead>
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<th></th>
<th>Grade 1 Mathematics</th>
<th>Grade 2 Mathematics</th>
<th>Grade 3 Mathematics</th>
<th>Grade 4 Mathematics</th>
<th>Grade 5 Mathematics</th>
<th>Grade 6 Mathematics</th>
<th>Grade 7 Mathematics</th>
<th>Grade 8 Mathematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Sch Scaled SOL Score 2011-2012</td>
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<td>N=26  429.63</td>
<td>N=33  406.09</td>
<td>16.82</td>
<td>N=20  375.70</td>
<td>N=23  503.67</td>
<td>N=20  411.73</td>
<td>N=21  31.56</td>
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<td>State Scale Score 2011-2012</td>
<td>N=23  424.70</td>
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<td>N=33  424.70</td>
<td>0.00</td>
<td>N=20  427.27</td>
<td>N=23  427.27</td>
<td>N=20  427.27</td>
<td>N=21  0.00</td>
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<td>N=23  430.85</td>
<td>N=20  430.85</td>
<td>N=21  0.00</td>
</tr>
<tr>
<td>Percent Change in Mean STATE Scaled SOL Score</td>
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<td>N=26  -0.34</td>
<td>N=33  -0.34</td>
<td>0.00</td>
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<td>N=20  3.58</td>
<td>N=21  0.00</td>
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<td>Average Sch Scaled SOL Score 2011-2012</td>
<td>N=9  336.79</td>
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<td>27.88</td>
<td>N=13  346.29</td>
<td>N=16  400.89</td>
<td>N=13  373.71</td>
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<td>N=13  420.50</td>
<td>N=16  420.50</td>
<td>N=13  420.50</td>
<td>N=16  0.00</td>
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<tr>
<td>State Scale Score 2012-2013</td>
<td>N=9  433.97</td>
<td>N=13  433.97</td>
<td>N=16  433.97</td>
<td>0.00</td>
<td>N=13  425.82</td>
<td>N=16  425.82</td>
<td>N=13  425.82</td>
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<td>N=16  9.29</td>
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<td>N=16  5.32</td>
<td>N=13  5.32</td>
<td>N=16  0.00</td>
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<tr>
<td>Average Sch Scaled SOL Score 2011-2012</td>
<td>N=13  352.04</td>
<td>N=16  441.94</td>
<td>N=19  392.01</td>
<td>27.08</td>
<td>N=13  351.34</td>
<td>N=16  445.46</td>
<td>N=13  400.10</td>
<td>N=16  28.84</td>
</tr>
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<td>N=13  370.96</td>
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<td>N=19  402.48</td>
<td>23.64</td>
<td>N=13  354.09</td>
<td>N=16  443.13</td>
<td>N=13  395.23</td>
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<td>State Scale Score 2011-2012</td>
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### Appendix O

**Table O**

*Sample Calculation of Predicted School-Level English/Reading and Mathematics Scaled Score*

<table>
<thead>
<tr>
<th>School</th>
<th>Test Level</th>
<th>Subject</th>
<th>Avg Sch Scaled SOL Score 2011-2012</th>
<th>Avg Sch Scaled SOL Score 2012-2013</th>
<th>State Scale Score 2011-2012</th>
<th>State Scale Score 2012-2013</th>
<th>% Increase or Decrease in Average State Scaled SOL Score</th>
<th>Scaled Points Added to 2011-2012 School Mean Scaled Score</th>
<th>Total Predicted School Score</th>
<th>Difference in Predicted and Actual Grade Level Score</th>
<th>Summed Difference in School Predicted Mean Scaled Score and Actual School Achievement</th>
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