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EDUCATORS' PERCEPTIONS OF THEIR INSTRUCTIONAL LEADERSHIP STYLES
AND THEIR PROBLEM SOLVING STYLES

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A Dissertation
Submitted in Partial Fulfillment of the
Requirements for the Degree of
Doctor of Education in Instructional Leadership
in the
Department of Education and Educational Psychology
at
Western Connecticut State University
2014

EDUCATORS' PERCEPTIONS OF THEIR INSTRUCTIONAL LEADERSHIP STYLES
AND THEIR PROBLEM SOLVING STYLES

Reine M. Issa, EdD

Western Connecticut State University

Abstract

Instructional leadership is not well-defined in the literature. The term has been used to describe the principal's role as an instructional leader. However, principals are not the only instructional leaders. Teachers are as well. In this study, data on leadership and problem solving style were collected one time from 378 educators in K-12 school settings in the northeast of the U.S. The purpose is to provide an empirical evidence of what describes instructional leadership.

The results of a 4×4×4 MANOVA indicated that there were significant differences between educators' scores on the leadership subscales for the Orientation to Change (OC): Explorer-Developer ($F(3, 290) = 8.236, p < .001, \eta^2 = .079$) and the Manner of Processing (MP): External-Internal ($F(3, 290) = 4.597, p = .004, \eta^2 = .045$) groups. The OC subgroups differed significantly in the areas of transformational leadership ($F(3, 290) = 6.956, p < .001, \eta^2 = .067$) and passive/avoidant leadership ($F(3, 290) = 4.438, p = .005, \eta^2 = .044$). The MP subgroups differed significantly in the areas of transformational leadership ($F(3, 290) = 3.683, p = .012, \eta^2 = .037$) and passive/avoidant leadership ($F(3, 290) = 3.128, p = .026, \eta^2 = .031$). There were no significant differences in mean scores of all types of leadership for the Ways of Deciding (WD) group. Furthermore, there were no significant interactions

between *VIEW* groups. All *VIEW* groups scored the highest on transformational leadership and the lowest on passive/avoidant leadership.

Three stepwise multiple regression analyses were used to determine the extent that educators' gender, years of teaching experience, highest degree earned, type of certificate, and scores on the problem solving styles predicted their perceptions of their leadership styles. Results indicated that the highest degree earned, educators' preference for Orientation to Change: Explorer-Developer problem solving style, gender, and type of certificate were significant predictors of the variance in the mean scores of transformational leadership, $R^2 = .189$, adjusted $R^2 = .179$, $F(4, 338) = 19.67$, $p < .001$. There were no significant predictors of the mean scores of transactional leadership at the Bonferroni adjusted alpha of .0125. The type of certificate was the only significant predictor of the passive/avoidant leadership subscale, $R^2 = .049$, adjusted $R^2 = .046$, $F(1, 341) = 17.40$, $p < .001$.

Data from three open-ended questions related to the participants' perceptions of leadership and problem solving were coded and analyzed. Four common overarching themes emerged: (a) personal characteristics, (b) knowledge and experience, (c) interactions with others, and (d) setting directions. The quantitative findings were then triangulated with the qualitative results to describe constructs of instructional leadership.

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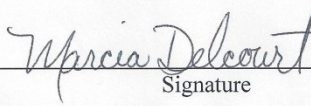
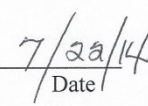
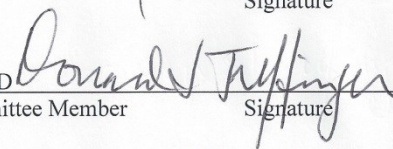
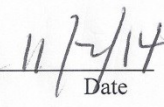

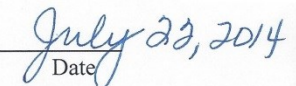
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Doctor of Education in Instructional Leadership*

Doctor of Education Dissertation

EDUCATORS' PERCEPTIONS OF THEIR INSTRUCTIONAL LEADERSHIP STYLES
AND THEIR PROBLEM SOLVING STYLES

Presented by

Reine M. Issa, EdD

Dr. Marcia Delcourt, PhD Primary Advisor	 Signature	 Date
Dr. Donald Treffinger, PhD Secondary Advisor Committee Member	 Signature	 Date
Dr. Janice Jordan, PhD Secondary Advisor Committee Member	 Signature	 Date

2014

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DEDICATION

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CHAPTER ONE: INTRODUCTION TO THE STUDY

The construct of instructional leadership emerged from effective schools studies in the 1980s (Bossert, Dwyer, Rowan, & Lee, 1982; Leithwood, Louis, Anderson, & Wahlstrom, 2004) to describe the role of school principals. Based on this research, school or district administrators were portrayed as instructional leaders when they demonstrated leadership characteristics targeting curriculum and instruction (Elmore, 2000) to improve teachers' practices, and hence to improve students' learning. These school leaders set high expectations such as "establishing academic goals and raising test scores" (Lashway, 1995, p. 2). They were described as *directive leaders* (Hallinger, 2005) who were involved in overseeing and managing their schools (Hallinger & Murphy, 1985, 1986). This concept of instructional leadership has had its limitations, particularly when it focused on one individual, the principal. It has been noted that this person might not be the expert in all content areas (Hallinger, 2007), which limits his or her ability to manage curriculum and instruction throughout the school to assist with school wide and district wide activities. Instructional leadership could be "distributed across the school community, with principals, superintendents, teachers, and policy makers" (Lashway, 2002, p. 1). Assistant principals, department chairpersons, and teachers have been recently described as instructional leaders and often serve in this capacity when provided with adequate support from their principals (Good, 2008; Klar, 2012).

In the 1990s, the term instructional leadership was replaced by school-based management and facilitative leadership, known as transformative leadership (Lashway, 1995) that Leithwood and his colleagues developed and elaborated by adapting Bass' (1985) transformational leadership in educational settings. Transformational leadership was well

received in the educational community because of its shared nature of leadership between the principal and the teachers (Leithwood & Jantzi, 2000).

With the 2001 No Child Left Behind Act, instructional leadership regained its popularity, but in a more comprehensive format than that used in the 1980s. A recent definition of instructional leadership incorporates technology, teaching and learning, professional development, and data analysis for decision-making (King, 2002). Leithwood, Jantzi, and Steinbach (1999) have recognized instructional leadership as one of the most popular concepts in education, but admit that it is not well defined. Different versions of instructional leadership models have been developed since its inception (Southworth, 2002). Such models include Leithwood's (Leithwood et al., 1999) approach that focuses on teachers' behaviors impacting students' growth, Hallinger's (Hallinger & Heck, 1997) model that describes instructional leadership as three categories of leadership practices, and Blasé and Blasé's model (1998) that emphasizes teachers' professional development as the most effective instructional leadership practice.

University instructional leadership programs such as the one at Western Connecticut State University prepare all educators "to create innovative learning environments; to respond to reform at the national, state and local levels; and to transform educational organizations" (WCSU, p. 1). However, questions still arise concerning the definition of instructional leadership and whether or not all educators are instructional leaders. Hoy's and Hoy's (2009) response to such questions indicated that "leadership in instructional matters should emerge freely from both principals and teachers" (p. 2) who would collegially engage in activities that improve the teaching and learning process. Instructional leadership would then emerge as a result of principals' and teachers' actions and interactions to improve

student learning. This type of shared instructional leadership would highlight the importance of educators' leadership in a learning community.

With an increasing demand for high quality teachers and effective school leaders, Connecticut piloted a research-based System for Educator Evaluation and Support (SEED) in 10 of its districts during the school year of 2012-2013 (CSDE, 2012). The goal of the new state model for evaluation is to strengthen educator practice. In other words, the purpose is to increase the effectiveness of all educators in their current roles. With a focus on teaching and learning, the model described the administrator as an instructional leader, and as proficient when he or she extends the role of instructional leaders to others and provides them with necessary support. The model serves as a vehicle to build the capacity for all teachers and to provide them with leadership opportunities based on areas of need.

Human resources in an educational setting may use different means to target curriculum and instruction, but they all seek to continuously improve student learning. Teachers and administrators may have some common leadership characteristics and preferences for problem solving that depict the uniqueness of instructional leadership. Instructional leadership is not limited to educators holding specific positions or assuming certain leadership roles. Leadership is not simply a position or a role; it is an interaction among and between the individuals and contexts. This is also true of instructional leadership.

This study sought to describe the characteristics of educators who held a variety of positions as teachers, administrators, and teacher leaders from urban, suburban, and rural environments in the northeastern United States. It was the intention of this researcher to provide clarification about the role of instructional leaders and some of the variables related to different types of leaders.

Rationale

Most research on instructional leadership assumes that instructional leaders are administrators who focus on curriculum and instruction to improve students' learning. However, Elmore (2000) extended this definition to include each stakeholder who plays a role in some type of distributed instructional leadership based on the individual's expertise "across the school community, with principals, superintendents, teachers, and policy makers" (Lashway, 2002, p. 1). Furthermore, Martin (2007) described teacher leaders as problem solvers. Teacher leaders may be intrinsically motivated educators who choose that role or may be assigned to be leaders in their schools. They may assume the role of instructional specialists, curriculum specialists, classroom supporters, facilitators, mentors, department chairs, data coaches, change catalysts, resource providers, or learners (Harrison & Killion, 2007). They constantly seek continuous improvement, demonstrate lifelong learning, and use their learning to support students' learning and success. They develop their leadership capacity through professional development opportunities and resources that administrators provide, but they often struggle to maintain a balance between their leadership responsibilities and teaching (Yost, Vogel, & Rosenberg, 2009), just as principals may struggle to balance their instructional and administrative roles.

Leadership organizations such as the National Association of Elementary School Principals (NAESP, 2008), Teacher Leadership Exploratory Consortium (TLEC, 2010), National Policy Board for Educational Administration (NPBEA, 2007), and Council of Chief State School Officers (CCSSO, 2011) require leaders in education to meet expectations or demonstrate behavior which they frame as standards, but they do not clearly describe instructional leadership. They use standards and frameworks to assess the effectiveness of an

individual as a leader and identify areas in need of personal growth and improvement. When the Connecticut State Department of Education (CSDE) piloted its System for Educator Evaluation and Development in 2012, it used standards-based measures of performance and practice to evaluate teachers and administrators. The result was the development of the Common Core of Teaching (CCT) Rubric for Effective Teaching and the Common Core of Leading (CCL): Connecticut School Leadership Standards that were adopted by CSDE (2012). Throughout the SEED Handbook (2013) the term instructional leadership refers to a principal's behaviors when the principal's practices of monitoring and continuously improving teaching and student learning are observed. The rating of a principal's performance changes from developing to proficient when the principal provides opportunities for others to become instructional leaders. However, the Handbook does not define what characterizes instructional leadership.

Hallinger (2007) interpreted instructional leadership as a top-down and directive model and transformational leadership as a bottom-up and participative model. He calls for a model of educational leadership that integrates instructional and transformational leadership based on the school's needs and context. Such a directive approach and a participative model promote dynamic interactions among educators at all levels, supporting a climate for creative problem solving and continuous improvement, thus enhancing educators' leadership capacity. In a review of literature on instructional leadership, Hallinger (2005) reported 110 empirical studies from 1983 through 2005 that focused on the principals' role as an instructional leader. Later, Hallinger (2011) reported that a large number of empirical studies focused on instructional leadership, transformational leadership, and shared leadership over the past four decades with the leaders' overall objectives to improve student learning.

Hallinger supported a *leadership for learning* model, which he developed with Heck (2010) because of the limitations of the original model of instructional leadership.

Statement of the Problem

Instructional leadership has been described as situational based on educators' roles and standards, and is not well defined in the literature (Leithwood, Jantzi, & Steinbach, 1999). Instructional leadership is not simply a position or a role; it is an interaction among and between the individuals and contexts. It involves administrators, principals, and teachers. It requires problem solving and shared decision-making. It is "shared with teachers, and in its best forms it is being cast as coaching, reflection, collegial investigation, study teams, explorations into uncertain matters, and problem solving" (Blasé & Blasé, 2004, p. 4). Therefore, there is a need to use empirical research to describe the characteristics of educators regarding their leadership styles and problem solving styles. Identifying these characteristics helps individuals understand their differences, capitalize on these differences, and recognize the importance of group dynamics to improve group effectiveness and student learning.

Statement of Purpose

The purpose of this study was to understand the characteristics of educators through the lens of diverse groups of teachers and administrators with different total years of experience in education, levels of education, types of certificates, and education roles in K-12 school settings by:

1. examining differences in their leadership styles based on each of three dimensions of their problem-solving styles;

2. investigating the relationships between their leadership styles and problem solving styles; and
3. understanding their perceptions about their leadership and problem-solving characteristics.

Potential Benefits of the Research

Potential benefits of the research include an understanding of leadership characteristics, problem solving styles, and the relationships between leadership styles and problem solving styles among a group of K-12 educators. This understanding promotes professional development opportunities that enhance educators' leadership and problem solving, to "implement complex school reform efforts" (Collay, 2011, p. 48). It also provides insight to personnel in higher education institutions who seek ways to improve their educator preparation programs.

Definition of Terms

The following terms are relevant to this study:

1. An *administrative certificate* is a qualification attained by educators who have or seek the knowledge, skills, and dispositions to be administrators.
2. An *administrator* is defined in this research as an educator who holds an administrative certificate and has a role as a school or district administrator. This typically includes assistant principals, principals, assistant and associate superintendents, and superintendents.
3. *Instructional leadership* is one of the most popular concepts in educational leadership that is portrayed through educators' characteristics and observed practices to improve curriculum, instruction, and student learning. In a meta-

analysis of studies on school leadership, instructional leadership has been described in 21 categories of specific behaviors related to principal leadership (Marzano, Waters, & McNulty, 2005).

4. *Leadership* is defined by Hughes, Ginnett, and Curphy (1993) as both an art and a science, and as a process, not a position. It “is an interaction between the leader, the followers, and the situation” (p. 18). It is a shared responsibility, and can only be developed through education and experience.
5. *Leadership styles* are consistent individual behaviors that leaders demonstrate when they motivate others and induce them to act to achieve specific goals (Burns, 1978). They are “categories of leadership behavior based on some predetermined theory” (Marzano et al., 2005, p. 28).
6. *Problem solving* involves closing the gap between the actual and desired outcomes using creative approaches that require courageous attitude and motivation to find problems, generate possible solutions, and develop a plan for action (Isaksen, Dorval, & Treffinger, 2011). It is the thinking and behavior in which one engages “to determine or construct a satisfying result or a promising new direction” (Treffinger, Selby, Isaksen & Crumel, 2007, p. 1).
7. *Problem-solving styles* “are consistent individual differences in the ways people prefer to plan and carry out generating and focusing activities, in order to gain clarity, produce ideas, and prepare for action” (Treffinger et al., 2007, pp. 2-3).
8. *Teacher leadership* “is a potentially powerful strategy to promote effective, collaborative teaching practices in schools that lead to increased student achievement, improved decision making at the school and district level, and

create a dynamic teaching profession for the 21st century” (Teacher Leadership Exploratory Consortium [TLEC], 2010, p. 3). Teachers “take responsibility for the learning of all students, advocate for each student’s needs, and actively investigate, innovate, and document new ways to advance the profession” (InTASC, 2011, April p. 3).

CHAPTER TWO: REVIEW OF THE LITERATURE

Chapter Overview

Chapter Two is organized in six major sections: (a) research analysis, (b) educators and leadership, (c) educators and problem solving, (d) educators and demographic characteristics, (e) emerging research questions, and (f) chapter summary. The first section, research analysis, is completed in three stages: (a) it explains the role of current educational reforms in the K-12 curriculum to support the researcher's interest in linking problem solving style to instructional leadership; (b) it illustrates how the database searches were completed to identify relevant research to this study; and (c) it closes with a summary of the selected research items. The second section, educators and leadership, presents a synopsis of prominent leadership theories, a theoretical background to instructional leadership, and a synthesis of the selected publications on instructional leadership. The third section, educators and problem solving, provides a theoretical background to problem solving style and its application in education. The fourth section describes current research on educators' demographic characteristics. The fifth section poses the three research questions addressed in this investigation and their hypotheses. The last section concludes the chapter with how the literature supports the need for this query.

Research Analysis

Role of Educational Reforms

Educational reforms are strategic initiatives that set the direction of curriculum, instruction, and assessment in K-12 educational settings (www.ed.gov). They impact teaching and learning, and in a way they recognize specific characteristics of an effective educator for a successful reform. Therefore, it is important to discuss the most recent

initiatives and how they influence education in general, and characteristics of educators in particular.

The United States Department of Education authorized the No Child Left Behind (NCLB) Act of 2001 and the American Recovery and Reinvestment Act (ARRA) of 2009 to support the most current standards-based education reforms. The NCLB (2001) was designed to close the academic achievement gap on state-created basic skills assessments through accountability, flexibility, and choice. However, the NCLB's strict requirements for the "2014 deadline for all students to be proficient in mathematics and language arts" (House, 2013, p. 8) encouraged 44 states to request NCLB waivers. These states agreed to adopt college and career readiness standards and to evaluate teachers based on student achievement. To revitalize the economy in 2009 and specifically to increase educational opportunities such as innovation and school improvement programs, the ARRA (2009) was signed into law. The purpose was to improve learning of all students, to develop globally competitive learners, and to develop rigorous curriculum standards that are common across the states (<http://www.corestandards.org>).

Impact on curriculum. Supported by students, educators, parents, and community leaders, the National Governors Association (NGA) Center for Best Practices and the Council of Chief State School Officers (CCSSO) led the new curriculum standards states' initiative, and developed the CCSS (2010) in English Language Arts and in Mathematics. Teachers and administrators are expected to set high expectations for all students and ensure that they have the knowledge and skills necessary for college and career readiness. They also are expected to prepare the students for the new generation of computer-based assessments, the Smarter Balanced Assessment Consortium (SBAC) or the Partnership for Assessment of

Readiness for College and Careers (PARCC) that are aligned with the CCSS. Piloted in 2013-2014 and to be implemented in the 2014-2015 school year (<http://www.smarterbalanced.org>), these assessments claim to be related to the real world. They require planning, management of resources, creative and critical thinking, flexibility, collaboration, and communication. They are intended to provide stakeholders with “the data and information needed to continuously improve teaching and learning; and help meet the President's goal of restoring, by 2020, the nation's position as the world leader in college graduates” (<http://www2.ed.gov>).

Impact on teaching and learning. Continuous improvement of teaching and learning has become a major factor in measuring educators’ performance using the state of Connecticut’s framework for teacher or administrator evaluation and support, SEED. Student learning and educator practice are two major categories of an educator’s evaluation. Student learning accounts for 45% of educator performance and educator practice accounts for 40%. The other two categories are based on feedback from stakeholders for teacher evaluation and effectiveness of stakeholders for administrator evaluation. The effectiveness of this framework is to be determined because it was piloted in 10 districts in Connecticut in 2012-2013 and implemented throughout the State in 2013-2014 (<http://www.connecticutseed.org>). Therefore, there is urgency for educators to be proactive; to learn new skills; to think creatively and critically as they foster dialogue about student learning and manage and prioritize resources. It is essential that educators align professional development, coaching, and feedback with SEED. Expected outcomes are to continuously improve practice, and hence improve student learning (<http://www.connecticutseed.org>).

Implications for educators. As we, educators, face these new challenges in our classrooms and in our schools, we are the problem solvers and the instructional leaders for this education reform. If our goal for our students is to be college and career ready, it is our responsibility to educate our students on how to apply knowledge in real world situations using higher-order thinking skills (<http://www.corestandards.org>). It is our responsibility to help students develop life-long learning skills such as communication, collaboration, critical thinking and problem solving, and creativity and innovation (<http://p21.org>). It is also our responsibility to help students develop life and career skills such as flexibility, initiative, productivity, social skills, and leadership (<http://p21.org>). Therefore, it is important that we work effectively in our teams to establish a climate that supports this education reform (<http://www.creativelearning.com>). It is critical that we understand our problem solving styles so that we appreciate each other's differences and better understand how these differences may impact our leadership styles.

Search Process

As per Connecticut's Guidelines for Educator Evaluation the term *teacher* refers to an individual "serving in a position requiring teacher certification within a district, but not requiring an [administrative] certification" (<http://www.connecticutseed.org>), and the term *administrator* refers to an educator who "serves in a role requiring an [administrative] certification" (<http://www.connecticutseed.org>). Educators holding the administrative certification and identified as *teachers*, may choose to continue to serve in their current teaching role or may be encouraged to serve as instructional or curriculum coaches, team leaders, or in school-wide or district-wide committees. They are not administrators, but they are teachers who demonstrate leadership behaviors beyond their classrooms. The researcher

questioned whether the program of administrative certification develops these educators' leadership skills and impacts their leadership styles. She further examined whether educators' gender, years of teaching experience, and problem solving style are related to their leadership styles. She conducted the search process in this study guided by the inclusion criteria and the search strategy described below.

Inclusion criteria. The publications that were selected for review have been identified using the following search terms, delimiters, and databases:

Search terms. EBSCOhost, Web of Knowledge, My ERIC, and SAGE searches were completed using a combination of the following terms: *instructional leadership* or types of leadership (*instructional leadership* OR *educational leadership* OR *administrative leadership*) when deemed necessary; educators (*teacher** OR *principal** OR *coach** OR *specialist** OR *instructional coach** OR *mentor**); *problem solving style*; *creative problem solving*; *years of teaching experience* or *years of experience*; *gender*; academic degrees (*level of education* OR *education level*); and type of certificate (*certificat**).

Delimiters. Database searches were limited to peer-reviewed journals and publications dated since 2002. The Web of Knowledge Boolean search on types of leadership was limited to *Education Educational Research* for Web of Knowledge category and to *Articles* for type of document. As for the terms *problem solving style* and *creative problem solving*, searches were refined to *Psychology Educational* for category, and *Articles* for type of document.

The delimiting categories for the two terms, *instructional leadership* and *problem solving style*, were different because the broader terms, *leadership* and *problem solving*, have been introduced in different fields of research in psychology. Leadership focuses on traits,

qualities, behavior, beliefs, and practices of an individual who has the power or authority to lead others. Problem solving focuses on the cognitive style and ability of an individual to successfully complete a task.

Database searches. EBSCOhost searches used Academic Search Premier, ERIC, and PsycINFO databases for three reasons: (a) to verify that the potentially selected EBSCOhost findings were relevant and the search was comprehensive, (b) to create a report for the combined searches in order to facilitate identifying the criteria used to include or exclude a publication, and (c) to create a comprehensive list of the publications on instructional leadership to be reviewed in this study. The EBSCOhost searches were conducted in January 2013 and later in July 2013 to include the most recent relevant publications dated 2002 or later. EBSCOhost result lists were converted to EXCEL spreadsheets using software called Web Content Extractor, and then they were combined with Web of Knowledge citation reports, My ERIC results, and SAGE. Spreadsheets helped identify the duplicate findings from the different databases and analyze the combined results.

Search strategy. The search strategy details how the searches have been completed and identifies the publications for literature review.

The researcher's interest to understand how educators' leadership styles are related to their problem solving styles focused searches on the following main concepts: (a) *educators*, (b) *instructional leadership*, (c) *leadership style*, (d) *problem solving*, (e) *problem solving style*, and (f) selected educators' characteristics (*gender, years of experience, highest degree earned, type of certificate*). It is important to review how these terms are applied in the literature. Therefore, a description of each of these six terms is included below. The researcher examined these concepts and some related terms because of their explicit or

implicit interdependence as the thesauri searches indicate below. Additional terms that were searched in educational settings include *perceptions*, *leadership*, the instruments of the *Multi-Factor Leadership Questionnaire* (MLQ) and *VIEW: An Assessment of Problem Solving Style*, and *creative problem solving*.

Educators. The first main concept, *educators*, is a synonym of the currently used term *teachers*. Teachers were known as instructional staff in 1966-1980 (Thesaurus of ERIC). More specific descriptors of the term *teachers* are *beginning teachers*, *cooperating teachers*, *elementary school teachers*, *experienced teachers*, *master teachers*, *secondary school teachers*, and *special education teachers* (Thesaurus of ERIC). The term, *educators*, is defined as professionals with “careers in education, as principals, school administrators, and experts in educational theory” (Academic Search Premier). Synonyms of the term *educators* in PsycINFO were broad terms such as *education*, *education degrees*, and *theories of education*, and they are beyond the focus of this research. Based on ERIC’s and Academic Search Premier’s definitions the researcher used the term *educators* to refer to school staff and administrators who participated in the study. The researcher constructed a Boolean search statement (“teacher*” or “principal*” or “coach*” or “specialist*” or “instructional coach*” or “mentor*”) along with the term *educators*.

Instructional leadership. The second main concept, *instructional leadership*, is a broad topic that has been examined in depth and in breadth in different contexts. The term *instructional leadership* is described as “providing direction, coordination, and resources for the improvement of curriculum and instruction” (Thesaurus of ERIC). It has been used to describe programs in colleges and universities that focus on a specific degree. It also has been used by leadership organizations to describe leaders in education who meet specific

standards. When an initial search was conducted using the term *instructional leadership*, these terms appeared in the title of a study, as a related subject, in the abstract, or in the text of the study. The publications with the term *instructional leadership* in their titles were subsumed in other studies that used the term in the abstract. This is why I searched for studies whose title included the term *instructional leadership*. Searching for the term *instructional leadership* in the title also eliminated publications that examined other types of leadership with a focus on curriculum and instruction.

This search identified 78 peer reviewed publications, out of which 11 studies were empirical. Four empirical studies (Chen, 2012; Higgins & Bonne, 2011; Lee, Hallinger, & Walker, 2012; Sahin, 2011) were conducted abroad, and were not considered for literature review to avoid concerns about cultural differences. The remaining 67 studies were reviewed for content and references. They were not selected for one of the following reasons: (a) they examined how initiatives impacted instructional leadership behaviors (Bredeson & Kose, 2007; Burch, 2007; Lewis, Rice, & Rice, 2011; Louis & Robinson, 2012); (b) they proposed a model for instructional leadership (Green & Cypress, 2009); (c) they focused on the principal's instructional leadership abroad (Borden, 2011; Brown & Chai, 2012; Gumus & Akcaoglu, 2013); (d) they described behaviors that would impact teachers in specific contexts (Calik, Sezgin, Kavgaci, & Kilinc, 2012; Fancera & Bliss, 2011); (e) they provided a review of the literature on instructional leadership (Hallinger, 2005); (f) they evaluated a mentoring program for beginning principals (Gettys, Martin, & Bigby, 2010); or (g) they were included later in a different section of Chapter Two (Ohlson, 2009; Robinson, 2010). However, Hallinger (2005) contributed to the theoretical background of instructional leadership and was an excellent source for references that the researcher examined to

determine if she could use any of them in this study. Table 1 provides a summary of the six empirical studies that were recognized for literature review on *instructional leadership* and *educators*.

Table 1

Selected Empirical Publications on Instructional Leadership

Authors	Purpose	Sample	Methodology	Data Analysis
Bays and Crockett (2007)	Investigate instructional leadership for special education	Elementary school principals ($n = 9$) in three districts in rural areas (southeastern); teachers ($n = 9$), SPED teachers ($n \geq 9$); coordinators of instruction ($n = 3$), school psychologists ($n = 9$)	Interviews, observations, and artifacts	Grounded theory methods: coding and member checks
Graczewski, Knudson, and Holtzman (2009)	Examine principal's instructional leadership in relation to teachers' professional development	Elementary teachers and principals (San Diego City)	Teacher surveys, school-based interviews, and principal observations	Mixed methods: correlational and multiple case study

(continued)

Table 1

Selected Empirical Publications on Instructional Leadership

Authors	Purpose	Sample	Methodology	Data Analysis
Ovando and Ramirez (2007)	Describe principals' instructional leadership actions within a teacher evaluation system	One district elementary, middle school, and high school principals ($n = 3$); assistant principals ($n = 3$)	Multiple case study; interviews, observations, and journals	Qualitative data analysis: coding, categories, and themes
Reitzug, West, and Angel (2008)	Explore how principals understand the relationship between their daily work and improvement of instruction	Principals ($n = 20$): 13 elementary, 2 middle, 4 high school, and one K-8 (southeastern US)	Qualitative: in-depth interviews, 1-2 hrs each	Grounded theory methods: coding

(continued)

Table 1

Selected Empirical Publications on Instructional Leadership

Authors	Purpose	Sample	Methodology	Data Analysis
Ruff and Shoho (2005)	Examine mental models of principals with different years of experience	Elementary principals ($n = 3$); teacher volunteers ($n = 2$) from each school (urban)	Collective case study: Principal 50-60 min interviews and 20-40 hrs observations; teacher interviews; documents/artifacts	Schema; patterns; peer data coding; member checks
Spillane, Hallett, and Diamond (2003)	Examine different forms of capital as a basis for instructional leadership	Teachers ($n = 84$) at eight public elementary schools (Chicago)	Qualitative: observations and interviews	Patterns, categories, peer data coding and checks

Leadership style. The third main concept, *leadership style*, is the search term (ERIC, PsycINFO) for three types of leadership: (a) *instructional leadership*, (b) *principal leadership*, and (c) *teacher leadership*. Table 2 lists the descriptors used for these types of leadership. It supports the use of the MLQ in this study to assess educators' leadership styles. The title search for MLQ and the three types of leadership in education was not effective. Three searches were then completed: the first search on the term *MLQ*, the second search on term *MLQ* and the term *educators*, and the third search on the terms *educators* and *self-perception of leadership*. The searches gave 29 results, but they did not contribute to this study. One publication (Fenn & Mixon, 2011) focused on one leadership style of superintendents by using the MLQ's 20 questions related to transformational leadership. The remaining 28 research items examined one of the following: (a) students' perceptions of university instructors' leadership (Bogler, Caspi, & Roccas, 2013), (b) agricultural education teachers' perceptions of their principals' leadership (Greiman, Addington, Larson, & Olander, 2007), (c) teachers' perceptions of their principals' leadership in countries other than the US (Barnett & McCormick, 2004; Cerni, Curtis, & Colmar, 2010; Nir & Kranot, 2006), (d) the MLQ dimensions in different contexts (Heinitz, Liepmann, & Felfe, 2005; Hetland, Hetland, Andreassen, Pallesen, & Notelaers, 2011; Hinkin & Schriesheim, 2008), (e) the literature on transformational leadership, or (f) the impact of principals' leadership on teachers and the school climate (Buluc, 2009; Cemaloglu, 2007).

Table 2

Leadership Thesauri Relevancy Ranked Terms – Year When the Term Was Introduced

Types of Leadership	Academic Search Premier	Eric Thesaurus	PsycINFO Thesaurus
Instructional leadership	Teacher leadership	Instructional Leadership	Transformational leadership (2003)
	LEAD teachers	Principals	Leadership qualities
	Educational leadership	School administration	Leadership style
	Direct instruction	Teacher leadership	
		Transformational leadership	
		Leadership style	
		Leadership qualities	

(continued)

Table 2

Leadership Thesauri Relevancy Ranked Terms – Year When the Term Was Introduced

Types of Leadership	Academic Search Premier	Eric Thesaurus	PsycINFO Thesaurus
Principal leadership	Assistant school principals	Transformational leadership	Transformational leadership
	Teacher-principal relationships	Principals	School principals (1973)
	High school principals	Teacher leadership	Leadership qualities
	Educational leadership	Instructional Leadership	Leadership style
	Principal-counselor relationship	Leadership style	
		Leadership qualities	
	Student-principal relationships	Leadership effectiveness	

(continued)

Table 2

Leadership Thesauri Relevancy Ranked Terms – Year When the Term Was Introduced

Types of Leadership	Academic Search Premier	Eric Thesaurus	PsycINFO Thesaurus	
Teacher leadership	Teacher leadership	Teacher Leadership	Cooperating teachers (1978)	
	LEAD teachers	Transformational leadership	Transformational leadership	
	Educational leadership		Instructional Leadership	Teacher effectiveness evaluation (1978)
			Leadership style	Teacher education (1967)
			Leadership effectiveness	Leadership qualities
			Leadership qualities	Leadership style

Problem solving. The fourth main concept, *problem solving*, was first introduced in 1967 (PsycINFO). It is a systematic and orderly process to find solutions to problems that may arise in educational and non-educational settings. It may describe how students and teachers solve problems in mathematics, science, and interdisciplinary subjects. It also may describe how individuals solve problems in business, management, and sociology. The term, *problem solving*, “is used if narrower terms such as conflict management, crisis management, or group problem solving do not apply” (Academic Search premier).

In a Boolean search on the terms *problem solving* and *leadership* in education, one research item (Robinson, 2010) was recognized for integrating content knowledge and building relationships in a problem solving context. Four other publications were found and removed from the literature review because they explored problem solving in the context of administrative preparation programs (Linn, Sherman, & Gill, 2007; Mountford, Ehlert, Machell, & Cockrell, 2007), building relationships (Gilley, 2003), or the role of principals in collaborative problem solving teams (Rafoth & Foriska, 2006).

Descriptors for problem solving. The descriptors of the term *problem solving* include problem solving (Academic Search Premier, ERIC, PsycINFO), group problem solving (Academic Search Premier, PsycINFO), and participative decision making (ERIC), but these descriptors do not include problem solving style and creative problem solving. Table 3 summarizes how the thesauri describe these terms. Whereas ERIC described cognitive style as relevant to each of the *problem solving*, *problem solving style* and *creative problem solving* terms, PsycINFO identified creativity as relevant to each of the three terms. Cognitive style is defined as “information processing habits which represent the learner's typical modes of perceiving, thinking, remembering, and problem solving” (ERIC).

Creativity is described as an “attribute of constructive originality, often manifested in the ability to discover new solutions to problems or find new modes of artistic expression” (ERIC). *Problem solving, cognitive style* and *creativity* as independent terms, are not of interest to the researcher in this study, but *problem solving styles* of educators are of value because they are critical to recognize and understand when implementing a change.

Table 3

Problem Solving Thesauri Relevancy Ranked Terms – Year When the Term Was Introduced

Search Terms	Academic Search Premier	Eric Thesaurus	PsycINFO Thesaurus
Creative problem solving	Creative ability (1968-1980) –	Problem solving	Creativity (1967)
	Use creativity	Creativity	Problem solving
	Group problem solving	Participative decision making	Group problem solving
	TRIZ theory	Cognitive style	
Problem solving	Problem solving	Problem solving	Problem solving (1967)
	Group problem solving	Participative decision making	Group problem solving (1973)
	TRIZ theory	Cognitive style	Creativity
	Group process		
Problem solving style	Group problem solving	Cognitive style	Problem solving
	Group process	Problem solving	Group problem solving
		Participative decision making	Creativity

Problem solving style. The fifth main concept, *problem solving style*, is related to the broader term *problem solving*. It is a fairly new concept that has not been defined by any of the thesauri. “Each individual is intelligent and creative, and can learn effectively if his or her style is understood and attended to in appropriate ways” (Treffinger, Selby, Isaksen, & Crumel, 2007, p. 2). Implementing and sustaining an education reform require an understanding of educators’ problem solving styles which promotes an understanding of how educators prefer “to work, think, solve problems and manage change” (Isaksen & Tidd, 2006, p. 320). This upholds the use of *VIEW: An Assessment of Problem Solving Style* in this study.

Database searches recognized a total of 26 peer-reviewed items on problem solving style and its related terms. One publication (Shaw, Selby, & Houtz, 2009) was considered for literature review because it assessed individual problem solving styles in an educational setting, and recognized gender differences on individual preferences for problem solving. The remaining 25 publications did not meet the inclusion criteria. They were directly related to the design and development of the problem solving style instrument *VIEW* (Selby, Treffinger, Isaksen, & Lauer, 2004; Treffinger, Selby, & Isaksen, 2008), the assessment of problem solving styles of graduate and/or undergraduate students (Houtz, Matos, Park, Scheinholtz, & Selby, 2007; Houtz, Ponterotto, Burger, & Marino, 2010; Houtz & Selby, 2009), a summary of recent studies on individual problem styles (Treffinger, Selby, & Isaksen, 2008), cross-cultural use of *VIEW* (Isaksen, De Schryver, & Onkelinx, 2010), or the use of creative problem solving in curriculum development (Chant, Moes, & Ross, 2009) and in executive coaching (Richard, 2003). One additional study (Isaksen & Geuens, 2007) was selected for review because it examined the relationships between the three dimensions of

VIEW and individual preferences for learning and using creative problem solving tools.

Table 4 summarizes publications on problem solving and problem solving styles that were selected for review.

Table 4

Summary of Selected Peer-Reviewed Publications on Problem Solving and Problem Solving Style

Author(s)	Purpose	Sample	Methodology	Data Analysis
Robinson (2010)	describe problem solving as a leadership capability		Theoretical	
Shaw, Selby, and Houtz (2009)	assess individual problem solving styles in light of Principles of Learning, Teaching, and Problem Solving	pre-service teachers: females ($n = 57$) and males ($n = 17$); ages 19-52; enrolled in an educational psychology class	Quantitative: Correlational and causal comparative	Correlational-Pearson; Three One-Way MANOVAs
Isaksen and Geuens (2007)	describe the relationships between <i>VIEW</i> and CPS	Managers in North America ($n = 51$) and US army ($n = 30$)	Quantitative: <i>VIEW</i> and a 33-item authors-created survey	Three One Way MANOVAs

Selected educators' characteristics. Database searches were carried out on educators' characteristics, such as gender, years of experience, highest degree earned, and type of certificate, because the researcher examined the relationships between these characteristics and educators' leadership styles. A summary of all publications on educators' characteristics that are identified to be reviewed in this study is provided in Table 5 at the end of this section.

Gender. The searches on the terms *gender* and leadership (*leadership style* or *types of leadership*) resulted in 20 publications. Nineteen publications were removed because they focused on the workplace in non-educational settings (Holmes, 2005; Mandell & Pherwani, 2003; McColl-Kennedy & Anderson, 2005), cross-cultural differences in schools (Fitzgerald, 2003), leader preparation programs (Rusch, 2004), leadership style of agricultural education teachers (Greiman, Addington, Larson, & Olander, 2007), or principal-teacher gender interactions (Burdick & Danzig, 2006; Lee, Smith, & Cioci, 1993). One paper (Fridell, Belcher, & Messner, 2009) on gender was selected for review in this study because it focused on gender and leadership styles of the participants. Two additional studies were included in the literature review on gender. One study (Eagly, Johannesen-Schmidt, & Van Eagen, 2003) was a meta-analysis in which the authors compared men and women using the MLQ normative database. Another study (Selby, Treffinger, & Isaksen, 2007) was the empirical foundation for *VIEW*; it examined the relationship between gender and problem solving styles of the participants in *VIEW*'s master database.

Years of experience. The Boolean searches on the terms *years of experience* and (*educators* or *types of leadership*) resulted in 37 research items. Three publications contributed to this study. Two of these selected items, Reitzug, West, and Angel (2008) and

Ruff and Shoho (2005) were included in the literature review on instructional leadership. The third item (Ohlson, 2009) is listed in Table 5. The remaining 34 publications were removed because they focused on the medical field (Goffredo, Paradiso, Ranieri, & Gadaleta, 2011), teacher self efficacy or job satisfaction (Klassen & Chiu, 2010; Van Maele & Van Houtte, 2012), leadership preparation programs (Eadens, Bruner, & Black, 2012; Everson, 2006; Plecki, Elfers, & Nakamura, 2012), teacher selection process (Place & Vail, 2013), the support that alternatively certified novice teachers need (Ovando & Casey, 2010), the development of teachers' trust and satisfaction (Van Maele & Van Houtte, 2012; Wahlstrom & Louis, 2008), or cross-cultural instructional leadership (Alghazo, 2005; Gumus & Akcaoglu, 2013; Shin & Koh, 2007).

Highest degree earned and type of certificate. The searches identified 15 peer-reviewed publications that were removed from the review because they focused on preparation programs (Evans, 2011; Mitchell & Romero, 2010), the impact of holding teacher certificate on student achievement (Curran Neild, Nash Farley-Ripple, & Byrnes, 2009), alternative teacher certification programs (Dieker, McTigue, Campbell, Rodriguez, Savage, & Jackson-Thomas, 2003; Paredes Scribner & Akiba, 2010), or how classroom teachers with administrative certificate would cope with dissatisfaction if they do not have the opportunity to become administrators (Evans & Golanda, 1994). Through a random search on leadership, the researcher recognized Valentine and Prater (2011) and included it for review because the authors examined the relationships between the school demographics, the principal demographics, and the principal leadership styles as perceived by the teachers.

Table 5

Summary of Peer-Reviewed Publications on Educators' Characteristics

Author(s)	Purpose	Sample	Methodology	Data Analysis
Eagly, Johannesen-Schmidt, and Van Engen (2003)	Examine gender leadership differences	42 reports on 45 data sets	Meta-analysis	Effect size for each study
Fridell, Belcher, and Messner (2009)	Examine gender principal leadership differences	445 public school (Midwest) principals: men ($n = 265$), women ($n = 180$)	Survey: Servant-Leadership Styles Inventory (SSI)	Discriminate analysis

(continued)

Table 5

Summary of Peer-Reviewed Publications on Educators' Characteristics

Author(s)	Purpose	Sample	Methodology	Data Analysis
Ohlson (2009)	Examine the impact of teacher characteristics (out-of-field teachers, advanced degree, years of experience) and school culture on student attendance and suspension rates	Teachers of 23 urban public schools (Florida); unit of analysis: school	Surveys for data collection; Correlational	Stepwise multiple regression
Selby, Treffinger, and Isaksen (2007)	Focus on the theoretical and empirical information regarding <i>VIEW</i>	10,151 participants from different sectors	One time data collection using <i>VIEW</i> : An Assessment of Problem Solving Style	Descriptive Statistics and correlations

(continued)

Table 5

Summary of Peer-Reviewed Publications on Educators' Characteristics

Author(s)	Purpose	Sample	Methodology	Data Analysis
Valentine and Prater (2011)	Understand the relationship between demographics and principals' leadership styles	1,038 teachers from 131 public schools (Missouri)	One time data collection from two instruments, Audit of Principal Effectiveness and Principal Leadership Questionnaire, and demographics survey	Correlational

To summarize, a total of 14 peer-reviewed publications were selected for literature review. Six empirical studies (43%) on instructional leadership were conducted in public schools with teachers and/or principals. They used qualitative ($n = 5$) and mixed ($n = 1$) research designs. One publication (7%) related to problem solving was theoretical. Two publications (14%) on problem solving style were quantitative: (a) one study was completed with pre-service teachers and (b) the other study was conducted with business managers and US Army members. Five additional quantitative studies (36%) on educators' characteristics were found to be relevant to educators' leadership.

Educators and Leadership

This section provides an overview of leadership theories, how research addresses instructional leadership, the theoretical construct of instructional leadership, and a review of selected empirical studies on instructional leadership.

Synopsis of Prominent Leadership Theories

Burns (1978), the most influential theorist in leadership, distinguished between two types of leadership: (a) transactional and (b) transformational. Transactional leadership focuses on managerial and organizational exchanges, yet it does not focus on building effective strong relationships between the leader and the followers (Bass, 1985).

Transformational leadership involves dynamic interactions between the empowering leaders and the followers. The leaders inspire their followers through perseverance, trust, and risk-taking. The followers then take charge, feel empowered, and become more involved and committed. Leaders and followers “move in and out of leader and follower roles” (Burns, 2003, p. 185), and are described as *Emotionally Intelligent* (EI) individuals who look for ways to continuously improve and enhance their organizational capacity for change

(Goleman, Boyatzis, & McKee, 2002). Relationship building, understanding change, moral purpose, knowledge building, and coherence-making become critical for business and educational leaders to improve their leadership in a culture of change (Fullan, 2001). These leaders would mold the change with the present organization's culture, and reshape the organizational units to achieve better results in a more competitive organization (Fullan, 2001). A change would be successfully implemented when it "begins with us—with our heart, head, and hands that drive our leadership practice" (Sergiovanni, 2005, p. 122).

Instructional Leadership

Types of leadership, whether transformational, transactional, motivational, or relational, influence the behaviors of school leaders (Marzano et al., 2005) including those who are instructional leaders. The term, instructional leaders, has been used to refer to principals or school leaders who target instruction and learning (Hallinger, 2005; Ylimaki & McClain, 2005), but in reality, instructional leaders are individuals who lead instruction (Neumerski, 2013). Instructional leaders are both principals and teachers (Hoy & Hoy, 2009). They understand students' differences, have knowledge of learning and learning theories, use motivational strategies, apply best practices to improve teaching and learning, create a positive learning environment, assess student learning, and promote a positive school climate (Hoy & Hoy, 2009).

While there has been an implicit distinction between educators' roles (school principals and teachers) and functions in the literature, there has been some undecided use of the term instructional leadership. According to a recent review of the literature, Neumerski (2013) recognizes three categories of instructional leadership: (a) traditional instructional leadership that is centered on the principal, (b) emerging instructional teacher leadership, and

(c) most recently, instructional coach leadership. Neumerski (2013) argues that all three categories of instructional leadership should be integrated to share findings and “to generate new knowledge around how leaders improve instruction” (p. 311).

Principal leadership. Principal leadership has been described as the activities, responsibilities, or functions of a school leader. For example, Smith and Andrews (1989) described instructional leadership as four types of activities: “resource provider, instructional resource, communicator, and visible presence” (p. 41) in which the principal engages. As a resource provider, the principal is expected to provide instructional materials necessary to deliver curriculum within a pre-approved budget and to promote staff learning through participation in staff meetings and professional development opportunities. As an instructional resource, the principal practices clinical supervision through classroom observations and dialogue with teachers to improve instruction. As a communicator, “the principal must be able to develop a sound and trusting relationship with the staff by behaving consistently, objectively, and fairly over time” (Smith & Andrews, 1989, p. 46). In terms of visible presence, the principal does multiple things at once and “seems to be everywhere” (Smith & Andrews, 1989, p. 47).

In a meta-analysis of 69 studies that were published from 1978 to 2001 on 2,802 K-12 schools in the United States, Marzano et al. (2005) identified 21 responsibilities of the school leader and examined the relationship between the leader’s behavior and the average student achievement on standardized tests in each school. Associated with his or her behavior and characteristics, a principal is someone who:

1. affirms the actions of others by celebrating successes and acknowledging failure;
2. serves as a change agent by challenging the status quo for continuous improvement;
3. provides contingent rewards when recognizing individual hard work and performance;
4. develops open and effective lines of communication with staff members and among teachers;
5. promotes a positive culture by developing a shared vision of the school;
6. oversees discipline to protect instructional time;
7. is flexible by adjusting leadership style to a situation and supporting individual initiatives;
8. provides a focus by establishing goals for curriculum, instruction, and assessment and setting expectations for all students;
9. confirms ideals and beliefs about school, teaching, and learning by sharing them with the staff members;
10. provides input by involving others in the design of policies and in decision-making;
11. increases intellectual stimulation by ensuring that staff members are continually informed of current research on effective schooling through meaningful dialogue and systematic discussions;
12. is directly involved in curriculum, instruction, and assessment by helping teachers design curricular activities and address instructional and assessment issues;

13. conveys knowledge of curriculum, instruction, and assessment by providing guidance regarding effective classroom practices;
14. monitors and evaluates curriculum, instruction, and learning;
15. works as an optimizer by “being the driving force behind major initiatives” (Marzano et al., p. 56) and inspiring teachers to be high achievers;
16. provides order by establishing routines and reinforcing “clear structures, rules, and procedures” (Marzano et al., p. 57) for teachers and students;
17. designs outreach by being an advocate for the school to all stakeholders;
18. understands relationships by being aware of the personal lives of teachers;
19. coordinates and disseminates resources by providing teachers with necessary instructional materials and professional development opportunities;
20. has situational awareness by being aware of current and potential issues at school and among staff members; and
21. is visible to all stakeholders by interacting with students, teachers, and parents (Marzano et al., 2005).

Each of the 21 principal’s responsibilities had “a statistically significant relationship with student achievement” (Marzano et al., 2005, p. 62) at the .05 level. The result was a statistically significant average correlation of .25 between the leadership behavior of the school principal, as determined by a mean score of the 21 responsibilities, and the average academic achievement of students. The lowest correlation value of .18 was for the principal’s understanding of relationships and the highest value of .33 was for situational awareness. The second to highest value was .28 for being flexible.

Marzano et al. (2005) further conducted a factor analysis of an online survey administered nationwide to at least 652 principals to determine how the 21 principal's responsibilities were interrelated. The survey consisted of 92 items related to the 21 responsibilities and the extent a school was involved in first-order change such as managing the daily operations of the school, or second-order change, for example, leading an initiative (Marzano et al., 2005). Each item has a score of 1, 2, 3, or 4. Each principal responsibility has multiple items. The results of the factor analysis indicated that all 21 tasks were important to first-order changes, and that only 7 responsibilities were important to second-order change initiatives. The more complex a problem gets and the more dramatic a change is, the more dramatic the shift in direction and the greater the need for "new ways of thinking and acting" (Marzano et al., 2005, p. 66). Among the 7 responsibilities, a principal's knowledge of curriculum, instruction, and assessment; communication of ideals to stakeholders; demonstration of behaviors that are consistent with shared beliefs (ideals/beliefs); and establishment of a system to continually evaluate practices (monitoring/evaluating) were vital when leading either type of change. In addition, the principal's responsibilities of being an optimizer, a change agent, a promoter of intellectual stimulation, and a flexible thinker when addressing the needs of the situation are important aspects when implementing a second-order change (Marzano et al., 2005).

Blasé and Blasé (1999) were the first to conduct an empirical qualitative study of teachers' perceptions of their principals' leadership characteristics (strategies, actions, interactions with teachers, goals) that may impact teaching, and to identify the characteristics that positively or negatively influenced classroom instruction. Data were collected using the Inventory of Strategies Used by Principals to Influence Classroom Teaching (ISUPICT), an

open-ended questionnaire. A total of 809 (251 male, 558 female) full-time public elementary ($n = 380$), middle ($n = 177$), and high school ($n = 252$) teachers taking courses “at three major universities located in the southeastern, Midwestern, and northeastern United States” (Blasé & Blasé, 1999, p. 357) participated in the study. The results of Blasé and Blasé (1999) led to the development of the Reflection-Growth (RG) model of effective instructional leadership that focused on two themes related to principals “talking with teachers to promote reflection and promoting professional growth” (p. 359). According to the first theme, principals talking with teachers to promote reflection would pursue the following strategies: (a) make meaningful and nonthreatening suggestions; (b) give effective and focused feedback; (c) model good instruction; (d) use inquiry and soliciting advice and opinions about teaching; and (e) give praise on specific teaching behaviors (Blasé & Blasé, 1999). Consistent with the second theme, principals promoting professional growth would use strategies such as: “(a) emphasizing the study of teaching and learning; (b) supporting collaboration among educators; (c) developing coaching relationships among educators; (d) encouraging and supporting redesign of programs; (e) applying the principles of adult learning, growth, and development to staff development; and (f) implementing action research to inform instructional decision making” (Blasé & Blasé, 1999, p. 373). Each of these instructional leadership strategies would have a positive impact on teachers’ self-esteem, motivation, efficacy, reflective behavior, flexibility, and risk-taking (Blasé & Blasé, 1999). As a result, the authors expected that there will be improved teaching and instruction through reflection, creativity, and innovation (Blasé & Blasé, 1999).

Increasing demands for creativity and innovation are not limited to teachers, teaching, and instruction, they are extended to other educators’ roles as well. In response to the “high-

stakes accountability with the high ideals of supporting social, physical and emotional needs of children,” the National Association of Elementary School Principals (NAESP) redefined the role of the principal leader to “demonstrate the vision, courage and skill to lead and advocate for effective learning communities in which all students and adults reach their highest potential” (NAESP, 2008). Although they identified six standards that characterize instructional leadership as leading: (a) student and adult learning, (b) diverse communities, (c) 21st century learning, (d) continuous improvement, (e) using knowledge and data, and (f) parent, family, and community engagement, they emphasized that leadership is no longer described in terms of traditional leadership qualities and standards in this continuously changing and complex world. There is a need to focus on the development of other qualities such as creativity and commitment to ongoing innovation (IBM, 2010).

Teacher leadership. Teacher leaders may become instructional leaders, but there is no empirical evidence in the literature that supports the development of this process (Lashway, 2002; Leithwood et al., 2004). Teacher leaders may have the role of a department head or the head of a data team. They may be the teachers who demonstrate leadership characteristics in the classroom or at school. Motivated by intrinsic rewards, a teacher may initiate being a teacher leader at school, or an administrator may assign a teacher to be the leader. There have not been specific paths for becoming a teacher leader, nor constructs identified to define teacher leadership. Most of the research and reforms described teacher leadership in the form of standards (NBPTS, 2002; TLEC, 2010) and descriptive qualities of effective teachers related to how they get prepared in initial educator programs (IEL, 2001a). The Institute for Educational Leadership (IEL, 2001b) revealed two perceptions about teacher leadership. One perception is that teachers possess traits of a leader in their

classrooms, are content-competent and pedagogy certified by the National Council for Accreditation of Teacher Education's (NCATE) preparation programs, and that they get involved in the public policy and in the decision-making process. Another perception is that some stakeholders are not yet ready for teacher leadership and involvement in school reform and public policy and, therefore, do not embrace or cultivate the role of teacher leaders. Members of IEL also stated that it is up to all stakeholders to realize the leadership potential of teachers and help them contribute to the school's leadership capacity. In a 2010 draft discussion document, the CCSSO described a change in the teacher's role from being autonomous in the classroom to becoming participative and collaborative with administrators and other teachers. Some states have initiated to cultivate teacher leadership as part of their newly revised teacher evaluation plans. For example, in June 2011, Massachusetts Board of Elementary and Secondary Education adopted new regulations to evaluate educators, so that they (a) promote growth and development among teachers and administrators, (b) improve student learning using multiple measures of student growth and achievement, (c) demonstrate excellence in teaching and leading, and (d) raise bar for professional teaching status (<http://www.doe.mass.edu>). In July 2011, the Tennessee State Department of Education designed a similar comprehensive, student outcomes-based, statewide educator evaluation system for teachers and administrators to be implemented in the 2011-2012 school year (<http://www.tn.gov>). In June 2012, the Connecticut State Department of Education (CSDE) developed a System for Educator Evaluation and Development (SEED) to promote educators' growth and leadership and improve student learning. In other terms, all educators across these states and other states share responsibility to increase all students' learning, and hence they all share leadership in leading instruction and learning.

Coach leadership. Coach leadership or instructional coaching has been used interchangeably with teacher leadership, “and yet it is not well understood” (Taylor, 2008, p. 10). Coaches do not typically hold formal leadership positions such as those of superintendents, principals, department heads, and curriculum leaders. They are peer teachers, facilitators, curriculum coordinators, specialists, mentors, or master teachers who interact and collaborate with other teachers within the classroom setting. They work with artifacts to directly develop other teachers’ instructional expertise based on the teachers’ needs (Taylor, 2008). Coaches provide their colleagues with constructive feedback and promote self-reflection in a non-threatening environment. They do not supervise and evaluate teachers formally, but they develop instructional capacity by “framing and communicating goals, knowing and coordinating curriculum, using data to monitor student progress, setting standards, and protecting instructional time” (Taylor, 2008, p. 13).

Theoretical Background on Instructional Leadership

Leadership in K-12 educational settings has taken different forms depending on the context, the individuals being observed, and the researchers’ interests. It has been described in terms of (a) principal leadership, (b) teacher leadership, (c) school leadership, (d) administrative leadership, (e) educational leadership, (f) instructional leadership, and (g) transformational leadership. Instructional leadership is a key construct in this study. It is not limited to a role or to an individual. It is a process through which principals, teachers, and coaches engage in activities to lead instruction (Neumerski, 2013) and improve teaching and learning (Hoy & Hoy, 2009). Instructional leadership is one of two major approaches to leadership in education, with the other approach being transformational leadership (Hallinger, 2003).

A framework for instructional leadership. Hallinger and Murphy (1987)

developed a framework for instructional leadership with a focus on the school principal as an instructional leader. The framework has three dimensions: (a) defining the school mission, (b) managing the instructional program, and (c) promoting a positive school climate. The dimensions comprise a total of 10 instructional leadership practices: (a) setting the school goals, (b) communicating the goals, (c) supervising and evaluating instruction, (d) coordinating the curriculum, (e) monitoring student progress, (f) protecting instructional time, (g) promoting professional development, (h) being highly visible, (i) providing incentives for teachers, and (j) providing incentives for students. The three dimensions are defined as the overarching principles guiding a school:

Defining the school mission. It is the principal's responsibility to define the school mission by setting the school goals and communicating these goals to the school community (Hallinger, 2003). The school goals should be clear, specific, time-based, and measurable in terms of the students' academic progress. They could be set by the principal or collaboratively with the staff, as long as the staff support these goals and incorporate them in their daily practices (Hallinger, 2005).

Managing the instructional program. This dimension impacts teachers and students. The principal manages the instructional program by supervising and evaluating instruction, coordinating the curriculum, and monitoring student progress (Hallinger, 2003). To manage the program effectively, the school leader is the expert in teaching and learning, works closely with the teachers, actively engages "in stimulating, supervising, and monitoring teaching and learning in the school" (Hallinger, 2005, p. 226), and is committed to school improvement.

Promoting a positive school climate. The school leader sets high standards and expectations, protects the instructional time, and promotes professional development. He or she is expected to be highly visible and to model values and best practices. He or she aligns incentives for teachers and for learning with the school goals, and develops a culture of continuous improvement (Hallinger, 2005).

Researchers who have employed this framework assessed the principal instructional leadership behaviors using Hallinger's Principal Instructional Management Rating Scales (PIMRS) instrument, which consists of 50 behavioral statements related to principal instructional leadership (Hallinger & Murphy, 1987). Principal instructional leadership behaviors target "first-order variables in the change process" (Hallinger, 2003, p. 339) and impact the quality of curriculum and instruction (Bays & Crockett, 2007; Blasé & Blasé, 2002; Lee, Hallinger, & Walker, 2012; Reitzug, West, & Angel, 2008).

A model for transformational leadership. Leithwood and Jantzi (2000) developed a model for transformational leadership in educational settings with an assumption that leadership is shared among principals and teachers. The goal is to develop capacity within the school and to improve school outcomes. The model is based on Bass' theory of transformational and transactional leadership theory (Bass & Avolio, 2004). Leithwood's model has three broad categories: (a) setting directions, (b) developing people, and (c) redesigning the organization (Leithwood & Jantzi, 2005) with a total of eight transformational and transactional components. These components are: (a) building a shared vision, (b) establishing shared goals, (c) setting high expectations, (d) modeling behavior, (e) providing intellectual stimulation, (f) offering individualized support, (g) creating a

productive culture, and (h) developing structures for shared decision making (Leithwood et al., 1999). A description of each of the three categories follows:

Setting directions. Setting directions is a key leadership function that involves three components: (a) building a shared vision, (b) developing consensus about school goals, and (c) creating high performance expectations. These leadership practices to setting directions incorporate articulating the vision that is appealing, inspiring and motivating to staff, giving meaning to a unified purpose of their work, holding high expectations for all, expecting “staff to be effective innovators” (Sun & Leithwood, 2012, p. 429), and aligning performance with school goals.

Developing people. Developing people is another key leadership function that also consists of three components: (a) modeling behavior, (b) providing intellectual stimulation, and (c) offering individualized support. Leaders develop people by modeling ethical behavior, infusing trust and confidence in staff, and demonstrating willingness to change (Sun & Leithwood, 2012). They listen to others’ opinions, attend to their individual needs, and support their professional development. They stimulate others’ creativity and provide them with feedback to promote reflection (Sun & Leithwood, 2012).

Redesigning the organization. Redesigning the organization entails two components: (a) creating a productive culture and (b) developing collaborative structures for shared decision making, which “are unique to school-based research” (Leithwood et al., 1999, p. 30). Leaders develop student-centered norms, beliefs, and values, and support teachers’ lifelong professional growth (Leithwood et al., 1999). They share power and responsibility with others, and they promote collaboration among them. They provide

opportunities for staff to participate in decision making and empower teachers to try new practices in their classrooms and schools (Leithwood et al., 1999).

Researchers using this approach to instructional leadership mostly used Bass' and Avolio's (1995, 2000, 2004) Multi-Factor Leadership Questionnaire (MLQ) to assess administrators' self-perception of leadership (Fenn & Mixon, 2011), teachers' perceptions of their principal's leadership (Barnett & McCormick, 2004; Cerni, Curtis, & Colmar, 2010; Hsiao, Lee, & Tu, 2013; Nir & Kranot, 2006), or students' perceptions of university instructors (Bogler, Caspi, & Roccas, 2013). Therefore, "transformational leadership seeks to generate second-order effects" (Hallinger, 2003, p. 338) and to promote teachers' organizational commitment (Khasawneh, Omari, & Abu-Tineh, 2012).

Other approaches to instructional leadership. Instructional leadership has been characterized as transactional and transformational. In the former case, it has been described as a directive top-down, first-order change that impacts curriculum and instruction (Hallinger, 2003). In the latter case, instructional leadership targets capacity building to create a climate of collaboration and continuous learning (Hallinger, 2003). Such conceptual differences between the two types of leadership in an educational context led researchers to propose other models such as shared or distributed instructional leadership (Hallinger & Lee, 2012; Klar, 2012; Lee, Hallinger, & Walker, 2012; Printy & Marks, 2006), or an integrated form of transformational and instructional leadership (Marks & Printy, 2003; Printy, Marks, & Bowers, 2009). Shared leadership promotes interactions between principals and teachers, and among teachers as well (Printy & Marks, 2006). These interactions provide principals and teachers with opportunities for innovation and problem solving to better respond to change (Printy & Marks, 2006).

Literature Review on Educators and Instructional Leadership

Hallinger's and Murphy's (1987) instructional leadership framework prompted researchers to examine the principal's instructional practices in different contexts (Bays & Crockett, 2007; Ruff & Shoho, 2005); how the principal protects instructional time, and supervises and evaluates instruction (Ovando, & Ramirez, 2007; Reitzug, West, & Angel 2008); and how he or she promotes professional development (Graczewski, Knudson, & Holtzman, 2009) to improve teaching and learning, and therefore to ensure continued growth and improvement. Instead of using a specific leadership instrument, the researchers used qualitative and mixed methods research designs to examine the principal's role as the instructional leader.

Instructional leadership in context. Due to the changing roles of school leaders from having centralized authority to sharing power and to being held to higher standards of accountability (NCLB, 2001), Ruff and Shoho (2005) used the concept of mental models to describe instructional leadership. A mental model is an experiential learning model in which the researcher observes others, assesses the situation by reflecting on the observation, and tests the design by implementing it, and then starts another cycle of observations (Kim, 1993). They used a collective case study design to understand the similarities and differences among three elementary administrators of successful urban schools. One administrator was a first year principal; another administrator had been a principal for 7 years; and the last administrator was identified as a distinguished principal with 23 years of experience as a principal. Teachers from each principal's school volunteered to participate in the study. Two teachers were selected based on availability. Data were collected from: (a) principal observations, dialectic exercise, and interviews; (b) teacher interviews; and (c)

artifacts (Ruff & Shoho, 2005). Each case study included a 50- to 60-minute interview with the principal, followed by 20 to 40 hours principal observations for two weeks, and a second interview in which the principal participated in a dialectic exercise. In the dialectic exercise, the principal would “recall a post observation conference with a teacher whose performance was unsatisfactory” (Ruff & Shoho, 2005, p. 560), write out the conversation with the teacher in the right column and then his or her thoughts in the left column. The teachers were then interviewed about the principal’s role in instruction. The artifacts that were collected included “memos, staff development agendas, site-based management team minutes, faculty meeting minutes, letters to parents, [and] periodic newsletters” (Ruff & Shoho, 2005, p. 560).

Data were analyzed using schema analysis in which the authors created a holistic meaning of the data collected, coded the data, identified patterns of the assumptions made to refine the coding process, and analyzed the emerging themes. Ruff and Shoho (2005) supported the trustworthiness of the three case studies by peer coding and member checks. Three themes were discussed in the three case studies: (a) perceptual focus, (b) standard for assessment, (d) approach design and implementation tactics (Ruff & Shoho, 2005). The novice principal constructed instructional leadership by finding the right balance between the programs and people within his school (Ruff & Shoho, 2005). He would assess this balance by looking at the State’s accountability measures. His approach to instructional leadership was to “continue data collection, diplomatically confront and persuade, or build collegiality” (Ruff & Shoho, 2005, p. 564). The principal with 7 years of experience sought opportunities to become personally involved and to help each child achieve at all times. She had a clear vision, modeled expectations, and interacted with teachers and students. She perceived conflict management as essential to a principal’s role to develop a productive school culture.

Her approach to instructional leadership was to “increase conflict, decrease conflict, and team building” (Ruff & Shoho, 2005, p. 567). The principal with 23 years experience focused on communicating expectations and vision. She assessed individual student learning and sought ways to optimize learning conditions for each child. Her approach to instructional leadership was personal involvement, which led to collaboration and an increase in shared understanding (Ruff & Shoho, 2005). There were many similarities among the three principals when describing the school issues and the daily routines. However, each principal had a different approach or approaches to instructional leadership. The novice principal appeared to be separating programs from people and using a heuristic approach to maintain the balance between the programs and the people in his school. The principal with 7 years of experience demonstrated that leadership is inherent within the person and that the different approaches she used were connected, not isolated (Ruff & Shoho, 2005). The principal with 23 years of experience assumed that instructional leadership was a collaborative process instead of a superior-subordinate process as demonstrated by the prior two principals. This collective case study is evidence that leadership and interpersonal tacit knowledge can be developed with more years of experience in education (Ruff & Shoho, 2005).

The research of Ruff and Shoho (2005) was included in this review of the literature because it showed how the principal’s years of experience influenced instructional leadership behaviors. It did not show what the authors claimed that it would describe the changing roles of school principals as a result of accountability and high-stakes testing. The selection of the participants, six teachers who were available and the school principals of three elementary urban schools was a limitation. There is a need to examine mental models in other school

contexts (Ruff & Shoho, 2005). There also is a need for empirical research “to facilitate the efficacy of mental models in cultivating tomorrow’s school leaders” (p. 575).

In the area of special education, Bays and Crockett (2007) investigated how instructional leadership occurred in a purposeful sample of nine elementary schools that used various service delivery models such as inclusive instruction and special education classes. They focused on the principals’ supervisory practices, the needs that the principals addressed, and the context to improve teaching and learning. The schools ranged in size from 123 to 560 students, within three school districts located in rural areas in the southeastern United States. In each district, they interviewed the director of special education who then suggested three schools as study sites. Bays and Crockett (2007) selected a homogeneous group of people involved in delivering special education: (a) the principal, (b) one general education teacher in an inclusive classroom, (c) at least one special education teacher, (d) the district coordinator of instruction, and (e) the school psychologist. They used theoretical sampling for five months in each district or until data were saturated and no new concepts emerged. In total, the authors interviewed 38 participants. They spent 3 to 5 days in each school and made two visits to each district office. They shadowed each school principal for 126 hours and recorded his or her actions and interactions related to special education instruction. They transcribed the interviews and observation notes, and collected principals’ and teachers’ journals, school board policies, memos among stakeholders, and other artifacts for data analysis. They used a grounded theory method and identified categories, subcategories, and relationships among the categories. They ensured the credibility of their study by using multiple sources of data for analyses, revising codes as deemed necessary, creating an audit trail, and using member checking and feedback to refine their theory. Based on the data

analysis and interpretation, three patterns about the principal's instructional role emerged (Bays & Crockett, 2007). First, the principal had an assigned role and was the sole administrator at the school. Second, the principal negotiated competing priorities such as: (a) balancing managerial, administrative, and supervisory duties on a daily basis; (b) complying with regulations for special education and ensuring instructional quality, and (c) evaluating teachers' performance and providing them with resources. Third, the principal negotiated contextual factors, which Bays and Crockett (2007) depicted as systemic and personal. Systemic factors would take account of time constraint, the school size, and the number of programs. Personal factors would include the principal's experience, understanding of special education, perception of special educators' competence, definition of special education instruction, matching strategies and resources with needs, and fostering collaboration (Bays & Crockett, 2007).

The principal was the assigned supervisor for instructional leadership. However, the negotiation of competing priorities and contextual factors resulted in shared responsibility among the principals, the directors of special education, and the teachers (Bays & Crockett, 2007). The principal was responsible for teacher observation and evaluation. Through communication with the teachers, he or she would share responsibility for all children, and would "provide emotional support to teachers of students with challenging learning needs" (Bays & Crockett, 2007, p. 155). The principal collaborated and consulted with the director of special education, who would provide resources and professional development opportunities to support special education teachers. The principal also encouraged special education teachers to interact with their colleagues at school informally, and provided them with opportunities to collaborate with team leaders, coordinators, and consultants within the

school (peer coaching, professional learning communities) or district wide (state-mandated mentoring programs).

Bays and Crockett (2007) did not observe systematic monitoring of instruction and use of research-based strategies. Neither did they observe intentionally distributed leadership; it was dispersed leadership, which appeared to be part of the negotiation process. The principal performed all instructional leadership duties simultaneously, and appeared to have limited knowledge of special education. The teachers valued the students' needs, but they did not differentiate instruction or monitor individual progress. As a result, Bays and Crockett (2007) recommended extending their research to larger schools and collecting data on student outcomes. They suggested providing the principals with specialized texts and electronic media due to their limited knowledge of special education. They also suggested providing support for informed and intentionally distributed instructional leadership, for instance, practices to include vision, trust, collaboration, academic press, meaningful support and ongoing PD, monitoring instruction and innovations (Bays & Crockett, 2007).

Bays and Crockett (2007) have relevant implications for the current study because they attempted to understand instructional leadership practices through the perceptions of a group of educators. The results focused on the principal's role in delivering special education instruction. This role has been compromised by his or her limited knowledge and competing responsibilities. Bays and Crockett (2007) pointed out that educators holding formal administrative positions may support instruction through communication, sharing responsibility, providing resources, and promoting interactions among teachers. Sharing responsibility should be informed and intentional (Bays & Crockett, 2007); otherwise, it is dispersed and ineffective. Bays and Crockett (2007) also implied that the teachers would

have led instruction if they differentiated instruction and monitored individual student progress. Conducting this research in small-sized elementary rural schools was a limitation that would be avoided by extending the research to larger schools (Bays & Crockett, 2007).

Instructional leadership and supervision. As a result of the high academic standards and the accountability movement, Ovando and Ramirez (2007) examined administrators' instructional leadership actions within a teacher performance evaluation. They conducted a qualitative multiple case study to examine administrators' perceptions of their actions that improve instruction, and how these perceptions differ between school levels. They selected an elementary school, a middle school, and a high school in a district, based on their ratings as successful, "according to the public school accountability standards set by the Texas Education Agency" (Ovando & Ramirez, 2007, p. 95). They selected the principals who were tenured for at least 3 years in their school. The principals then identified their assistant principals who taught at least 3 years in public schools and who were involved in goal setting, planning, and implementation of school improvement. Ovando and Ramirez (2007) collected data from three sources: (a) a structured 45-minute taped interview with each participant; (b) notes of relevant data during the interview; and (c) the principal-teacher interactions during their meetings, teacher rooms and conferences. Data were analyzed using codes, categories, and emergent themes. The findings were then triangulated with the district's manuals related to teacher professional development, orientation, and evaluation (Ovando & Ramirez, 2007).

Three themes on the principals' instructional leadership actions emerged from the data analysis at the three school levels: (a) setting clear expectations, (b) monitoring instruction by conducting walk-through observations, and (c) connecting staff development

to the evaluation system (Ovando & Ramirez, 2007). When comparing the principals' perceptions of their actions to improve instruction, the elementary and middle school principals reported that they adopted a multi-year evaluation process. This means that the teachers who had been at the school for three consecutive successful years "could opt to be evaluated every other year" (Ovando & Ramirez, 2007, p. 100). According to these principals, providing the experienced teacher flexibility in their evaluation schedules would positively impact instruction (Ovando & Ramirez, 2007). The middle and high school principals reported that they had assisted teachers in need, and had applied the district's evaluation system as a formative and a summative tool "to provide teachers with opportunities for growth and development" (Ovando & Ramirez, 2007, p. 102).

Furthermore, there were differences among the principals by school level. The elementary school principal: (a) applied the teacher performance evaluation as a process by conducting several walk-through observations during the year instead of a one-time 45 minutes observation, and (b) aligned the instructional strategies to the teacher evaluation system to make sure that the teacher meets the system expectations (Ovando & Ramirez, 2007). The middle school principal would: (a) plan for instruction and classroom assignments for the following year based upon the data gathered from individual teacher evaluations, and (b) set goals for teacher development according to individual needs as per the teacher evaluations (Ovando & Ramirez, 2007). The high school principal would: (a) select specific instructional strategies that focus on promoting higher order thinking skills and creative and critical thinking skills to meet the needs of the district's gifted and talented program and their advanced placement program; and (b) apply the teacher performance evaluation system as a formative and a summative tool (Ovando & Ramirez, 2007). The

findings would “suggest that the principal’s instructional leadership actions associated with teacher performance appraisal aim at teacher and student academic success” (p. 106).

Although there was not enough information on the participants’ number of years of experience, the Ovando and Ramirez (2007) study was selected for literature review because it examined instructional leadership actions of principals and assistant principals who were tenured for at least 3 years as administrators at their schools. In the current study, the researcher sought to understand how educators’ years of experience would influence their leadership, and therefore, she was interested in identifying the administrators’ instructional leadership actions that were associated with teacher performance evaluations (Ovando & Ramirez, 2007). Ovando’s and Ramirez’s (2007) study was limited to three purposefully selected schools, but it could be replicated in other schools. Furthermore, Ovando and Ramirez (2007) examined three different approaches to using teacher performance evaluations at schools in the same district, indicating the possibility of using teacher performance evaluations in multiple ways: (a) supervising and evaluating instruction (Hallinger & Murphy, 1987), (b) offering individualized support (Leithwood, Jantzi, & Steinbach, 1999), and (c) providing intellectual stimulation (Leithwood, Jantzi, & Steinbach, 1999).

Reitzug, West, & Angel (2008) explored how principals understand the relationship between their daily work and the improvement of instruction in their schools. Twenty principals (17 female, 3 male) in the southeastern United States participated in the study: (a) thirteen elementary school, (b) two middle school, (c) four high school, and (d) one K-8 principals. Two female principals were African American. Eight principals had 4 years of

experience, seven principals had 5 to 8 years of experience, and the remaining five principals had at least 9 years of experience as a principal.

Each principal was interviewed for 1 to 2 hours. The interviews were taped, transcribed, and then coded based on the principals' perceptions. Reitzug et al. (2008) conceptualized four dominant themes of instructional leadership. They were: (a) relational, (b) linear, (c) organic, and (d) prophetic. Reitzug et al. (2008) described relational instructional leadership as an indirect theory of instructional leadership. It is grounded in psychology and human relations, and emphasizes concepts such as self-efficacy and motivation (Reitzug et al., 2008). The authors defined linear instructional leadership as monitoring instruction and assessment, and providing feedback to ensure that teaching is aligned with curriculum and standards (Reitzug et al., 2008). Organic instructional leadership prevails when teachers and other staff members continuously learn about their practice as part of the school's practice (Reitzug et al., 2008). It is the type of leadership that develops others' leadership capacity, and encourages them to be reflective and to engage in collaborative discussion among their grade levels and work in their professional learning community (Reitzug et al., 2008). Prophetic instructional leadership is talking about beliefs, about what is right to be learned, and what it means to work with others and have a learning community (Reitzug et al., 2008). It is what Sergiovanni (1996) calls moral leadership.

Reitzug et al. (2008) posed questions about each of these concepts of instructional leadership wondering whether it is sufficient for a principal to have skills and a purpose to be an instructional leader. However, few principals discussed how to improve instruction and achievement at their schools (Reitzug et al., 2008). Reitzug et al. (2008) concluded that:

1. the relational instructional leadership works best for novice principals.
2. the linear type of instructional leadership is mostly responsive to high-stakes testing environments.
3. the organic instructional leadership requires a supportive environment, a culture of inquiry and embedded professional development to promote individual growth. It helps create stimulating intellectual places for teachers and students.
4. the prophetic leadership encourages staff members to constantly examine the assumptions about the purpose of education and to challenge the status quo of schooling.

Reitzug et al. (2008) was selected for review because it focused on a diverse group of principals with different years of experience, and their perceptions of their instructional leadership daily practices. The themes that Reitzug et al. (2008) constructed differed among the principals based on their years of experience, but the authors were unclear about relating a specific theme to a range of years of experience. The themes appeared to evolve from building relationships (Leithwood, Jantzi, & Steinbach, 1999) and encouraging the heart (Kouzes & Posner, 2002); to monitoring student progress (Hallinger & Murphy, 1987); to providing intellectual stimulation (Leithwood, Jantzi, & Steinbach, 1999) and talking with teachers to promote reflection (Blasé & Blasé, 1999); and then to challenging the process (Kouzes & Posner, 2002) and demonstrating creativity and innovation.

Instructional leadership and professional development. Graczewski, Knudson, and Holtzman (2009) examined the relationship between the role of the principal as an instructional leader and the professional development that the teachers in San Diego City Schools received in the context of a district-wide reform. Aspects of the principal's role

included establishing a coherent school-wide vision for instructional improvement and getting engaged in instructional improvement. Assuming that the principal's instructional role was to ensure that teachers have the opportunity to deepen their knowledge and change instruction, which would lead to improved student achievement, the authors determined how the aspects of instructional leadership were associated with curriculum-focused professional development related to English Language Arts (ELA; Graczewski et al., 2009). The research team developed a series of context-related surveys that were administered to a sample of teachers from 49 elementary schools (Graczewski et al., 2009). The purpose was to assess teachers' perceptions of leadership, how leadership related to their instruction, how they viewed professional development, and the relationship between leadership and professional development. Teachers' perceptions of instructional leadership encompassed four scales (Graczewski et al., 2009): (a) coherence of a school-wide vision, (b) focus on student learning and achievement, (c) follow-up and support, and (d) principal's engagement in instructional improvement. Two additional scales measured teachers' perceptions of the characteristics of professional development: (a) coherence and relevancy and (b) content and curriculum-focused.

Graczewski et al. (2009) also conducted case studies of nine elementary schools to triangulate the findings with those of the survey data. The research team visited each of these schools six times over a period of 2.5 years. During each visit, they interviewed the principals, the assistant principals, the peer coaches, and at most 12 randomly selected teachers from different grade levels at each school. The teachers were not interviewed on the first visit. During the first year, a member of the research team shadowed each principal for one day and observed professional development sessions. The focus was on a vision that was

driven by the students' needs. During the second year, the emphasis was on improving teacher planning, strategies of instruction, strategies for professional learning, and collaboration among grade-level teachers. The goal was to improve student learning (Graczewski et al., 2009). Using a correlational analysis, the authors found positive correlations for each of the leadership scales and the professional development scale measuring teachers' perceptions of coherence and relevancy of professional development. Graczewski et al. (2009) found that: (a) teachers' ratings of a coherent school-wide vision were significant ($p < .001$) predictors of their ratings of a coherent and relevant ELA professional development; and (b) teachers' perceptions of the principal's engagement in instructional improvement were significant ($p < .001$) predictors of their ratings of the content and curriculum of ELA professional development (Graczewski et al., 2009).

Similar patterns emerged from the qualitative data and were consistent across the schools. The principals who established a clear coherent vision and defined a core goal at their schools were able to communicate the goal to the staff members. The teachers at these schools indicated that they could articulate the goal, and that the goal was supported by the professional development activities. The teachers in others schools where the principals did not clearly communicate school goals, either did not understand the purpose of the professional development that they received or described it as random and disconnected (Graczewski et al., 2009).

The teachers also indicated that the principals who were highly engaged in instructional improvement were visible, *continuously* monitored instruction, and provided *immediate feedback to teachers*. They allocated resources to support teachers' professional needs. They focused professional development activities on standards-based curriculum and

on building teachers' knowledge of the district's Units of Inquiry model. The teachers showed concerns about the principals who were not highly engaged in instructional improvement because they had limited understanding of the learning needs of teachers, and therefore, they provided limited opportunities for teachers to improve content and curriculum (Graczewski et al., 2009).

However, building a coherent vision or getting involved in instructional improvement were not the only characteristics of instructional leadership. Some external factors would "hinder the success of a site-based instructional leadership model" (Graczewski et al., 2009, p. 91) such as:

1. Principal capacity. The teachers often looked for a leader with expertise and would not use the principal as an instructional leader if he or she did not know the subject matter, or if he or she was unable to communicate the knowledge to the teachers (Graczewski et al., 2009).
2. Competing demands. There existed competing demands for a principal's time. It was difficult for principals to balance their administrative responsibilities and their instructional responsibilities. Examples of administrative responsibilities would be running meetings for construction, reaching out to the community for support, and attending meetings out of school related to certain issues (Graczewski et al., 2009).
3. Top-down conceptions of instructional learning. Because San Diego's instructional leadership model was a top-down approach in the area of professional development, it was difficult to distribute instructional leadership (Graczewski et al., 2009).

4. Relationships, expertise, and sustainability. Site-based instructional leadership in San Diego's schools focused on instruction and professional development, and unconsciously devalued teachers' expertise and input. In most schools, the principal's relationships with the teachers suffered except for the principals who took the initiative to improve these relationships by soliciting input from the teachers and valuing their opinions on important staffing decisions.

This study (Graczewski et al., 2009) was included in the literature review because it provided evidence of the relationship between the practices of leadership and the characteristics of professional development to improve instruction, based on the perceptions of principals, assistant principals, peer coaches, and teachers. Although Graczewski et al. (2009) considered the principal capacity, his or her time limitations, and the top down approach to professional development at the district, as obstacles to the site-based instructional leadership, the competent principal was able to overcome these obstacles by building relationships with the teachers and soliciting their advice and opinions (Blasé & Blasé, 1999) to improve classroom instruction.

Instructional leadership and capital. Spillane, Hallett, and Diamond (2003) “defined instructional leadership as influence over teachers’ instructional practices” (p. 4) so that they “capture teachers’ experiences with leaders, rather than their abstract assessments of leaders’ qualities” (p. 4). The purpose was to examine how teachers would construct leadership in their contexts based on the forms of capital and the leader’s role. This publication was based on the first year data collected for the Distributed Leadership Project, a four-year longitudinal study involving 13 Chicago elementary schools: (a) seven predominantly African American, (b) three predominantly Hispanic, and (c) three mixed

schools. The authors interviewed 84 teachers from eight schools that they selected for this study using selective and theoretical sampling. They observed 45% of these teachers in the classroom. After the class observation they asked them specific questions about their instructional practices, and the people whom they identified as influential. In their interviews with the non-observed teachers, Spillane et al. (2003) focused on the changes that the teachers had made to their instructional practices, and the people who influenced these changes. If the teachers reported no changes, they were asked to reflect on their instructional practices and hypothesize a change. Spillane et al. (2003) looked for emerging patterns and hypotheses while they were refining the data collection strategies during the study. They developed the categories based on the distributed leadership framework. They identified three attributes of the coding system: (a) who or what influenced classroom instruction, (b) the dimension of instruction, subject matter and aspect of instruction, which was influenced, and (c) the rationale for identifying someone as influential (Spillane et al., 2003). To ensure trustworthiness in the data analysis, the authors collaborated on developing the coding categories and their meanings. They identified six emerging patterns: (a) human capital, (b) cultural capital, (c) social capital, (d) economic capital, (e) structural, and (f) demographics. In their study, the researchers focused on the construction of instructional leadership and the four forms of capital (Spillane et al., 2003). Human capital is what the teachers referred to as the knowledge, skills, and expertise of others. Expertise may represent practical experience, meeting the requirements of a formal certification, or teaching tenure. Cultural capital refers to interactive styles, supportive style, and ways of doing things. Social capital is relational and may refer to trust, sharing, and social networks or connections. Grade-level team meetings and professional learning communities may bring people together and facilitate the

formation of social capital. Economic capital is in the form of textbooks, instructional materials, and resources. Spillane et al. (2003) found out that the principal was influential to 83.3% of the teachers in their instructional practices as compared to 79.8% who cited other teachers to be influential. When the teachers constructed leadership to other teachers, 45.2% cited human capital, 59.5% referred to cultural capital, 50.0% mentioned social capital, and 27.4% named economic capital. When they constructed leadership to their administrators, 21.4% quoted human capital, 70.2% referred to cultural capital, 15.5% talked about social capital, and 23.8% pointed out economic capital (Spillane et al., 2003).

Based on the data, the interactive style appeared to be the most important for all leaders, teachers and administrators. Although institutional perspectives suggested that administrators would be constructed as leaders based on expertise and instructional materials, the data indicated that the administrators were constructed as leaders based on their interactions with teachers to motivate change (Blasé & Blasé, 1999). The teachers were more likely to be constructed as leaders on the basis of knowledge, skills, expertise, teacher-teacher interactions, and social connections than were the administrators. They did not emphasize the formal position of a principal as they were constructing leadership rather, they included forms of capital.

This study (Spillane et al., 2003).was considered for review because it examined how teachers constructed leadership in their contexts. Consistent with prior research (Blasé & Blasé, 1999; Graczewski et al., 2009; Reitzug et al., 2008) the teachers identified their administrators as leaders based on interactions with them. They also constructed other teachers as leaders based on their knowledge, skills, expertise, interactions, and social

connections. It was intriguing that the term interactions appeared as a leadership characteristic regardless of the role or the formal position of the individual.

Educators and problem solving

In this section, the researcher provides an overview of *creative problem solving* as one of the theoretical foundations for the Problem Solving Style Model, the theoretical construct of problem solving style, and a review of selected studies on problem solving in education.

Creative Problem Solving

School leaders and classroom leaders solve problems on a daily basis. These problems may be routine, such as scheduling classes, addressing classroom behavior, or preparing inquiry lessons. In other words, the problems may be somewhat isolated incidences, such as dealing with storm damage to a school or a building, responding to diversity issues, addressing a budget crisis, or developing a plan to respond to changes in legislation that impact curriculum and instruction. Solving routine problems requires prior knowledge, but solving ill-structured problems requires creative responses. Approaches used to design creative solutions employ *creative problem solving* (Treffinger, Selby, & Isaksen, 2007).

Our understanding of the creative problem solving process has evolved over almost nine decades, first suggested by Graham Wallas in 1926 (Davis & Rimm, 2004). The most current model of this process is the Creative Problem Solving Model, CPS Version 6.1™ (Isaksen et al., 2011). It has four components (three process components and one management component) and eight stages that are connected as a circular process (Treffinger et al., 2007). A component is a group of activities that people deal with during creative

problem solving. Each component has at least one stage (Treffinger et al., 2007). Each stage in the three process components consists of two phases: (a) a generating phase in which an individual or a group of people generates options, and (b) a focusing phase in which one refines these options (Treffinger et al., 2007).

Understanding the Challenge. Understanding the Challenge is a process component that helps identify a complex problem. It consists of three stages: (a) Constructing Opportunities, (b) Exploring Data, and (c) Framing Problems. Constructing Opportunities helps identify multiple opportunities or desired goal and then focus on specific options. Exploring Data helps identify and focus on relevant and important data. Framing Problems involves generating possible problem statements and then focusing on the problem statement with the utmost priority (Treffinger et al., 2007).

Generating Ideas. Generating Ideas is a process component. It is also the stage of this component. It involves producing creative ideas to solve a problem or to implement a change and selecting “ideas that are new, intriguing, and promising for further refinement and development” (Treffinger et al., 2007, p. 83).

Preparing for Action. Preparing for Action is a process component. It includes two stages: Developing Solutions and Building Acceptance (Treffinger et al., 2007). Developing Solutions involves generating a clear list of criteria such as qualities, rules, or tests to help guide “selection, evaluation, and development of solutions” (Treffinger et al., 2007, p. 117). Building Acceptance deals with making the change and taking initiative to implement the solution. It requires understanding of the context and the people involved. It also requires coordinating actions, communicating with others, engaging them in generating potential actions or behaviors, and following through to build others’ acceptance of the change,

support, and commitment (Treffinger et al., 2007). Focusing in the Building Acceptance stage directs attention and effort to move forward from the current reality to the desired state (Treffinger et al., 2007).

Planning Your Approach. Planning Your Approach is a management component. It embraces two stages: Appraising Tasks and Designing Process (Treffinger et al., 2007). Appraising Tasks involves monitoring one's own thinking and managing choices that are available in a given context. Designing Process involves using knowledge of the task and needs of the situation to develop a plan that best uses the CPS to fit the needs of the individual, the group, or the organization (Treffinger et al., 2007).

This approach to CPS is a *multi-dimensional system*. It “provides a variety of powerful, cognitive, rational tools and strategies, [and] it involves explicit consideration of the person, the context, and the need” (Selby et al., 2007, p. 11). These tools have been effective for individuals of all ages and groups in different organizational and educational settings when solving complex problems or managing a change (Treffinger, 2007). Using these tools and solving problems creatively require an understanding of individual differences in problem solving styles because there is no single way to solve complex problems. Such an understanding helps people appreciate each other's differences and use these differences to improve overall performance (Selby et al., 2007).

Theoretical Background on Problem Solving Style

The concept of problem solving style is grounded in the “psychological type theory, learning style theory, cognitive style theory, creativity, creative productivity, and creative problem solving” (Treffinger et al., 2007, p. 4). A problem solving style depends on the individual characteristics of people, how they learn and apply these skills, how they prefer to

approach a situation, and their level of creative productivity (Treffinger et al., 2007). Based on their expertise and research in these areas, Treffinger and his colleagues (2007) developed the Problem-Solving Style Model. The model has three independent dimensions: (a) Orientation to Change, (b) Manner of Processing, and (c) Ways of Deciding. Treffinger et al. (2007) define each dimension as a continuum of style preferences. The end points of the Orientation to Change continuum represent the well-defined problem solving styles. Styles in the center of the continuum are called Moderate preferences.

Orientation to Change. Orientation to Change (OC) refers to how individuals prefer to manage structure, novelty and authority when they respond to change or solve ill-structured problems (Treffinger et al., 2007). Individuals manage structure either by demonstrating preference for specific directions or no directions. They look for a workable solution or they tend to be innovative and generate many options and solutions. They may feel comfortable working when they are supervised or they are individualistic and trust their own judgment (Treffinger et al., 2007). The end points of the OC continuum are the Explorer and the Developer styles. A Moderate OC individual may vary his or her behavior depending on the situation, the task, or motivation (Treffinger et al., 2007). Whereas a Moderate Explorer demonstrates the same characteristics as a Well-defined Explorer, he or she may better understand the Developer style than the well-differentiated Explorer. A Moderate Developer may appreciate the Explorer's novelty and multiple options or solutions, even though he or she shares many characteristics of the Well-defined Developer (Treffinger et al., 2007).

Manner of Processing. Manner of Processing (MP) refers to how individuals prefer to manage information, share their thinking and interact with others (Treffinger et al., 2007).

Individuals may prefer to draw energy from others through socializing and interacting with the environment, or they may prefer to draw energy from within. They may share their thinking early in the process of problem solving and seek input from others and build on their ideas before making a decision, or they may prefer to think alone and share their ideas after they think them through (Treffinger et al., 2007). The well-defined MP problem solving styles are the External and the Internal styles. A Moderate MP individual may value how others with the opposite preferences may approach problems. A Moderate External may put off idea sharing and action to allow the Internal to reflect on the situation. A Moderate Internal may be willing to put off reflection and may engage in exchanging ideas with the Externals (Treffinger et al., 2007).

Ways of Deciding. Ways of Deciding (WD) refers to how individuals prefer to maintain harmony in the group or to emphasize rigor and standards (Treffinger et al., 2007). They may be sensitive and so they care about others when they respond to their ideas, or they may keep other individuals and their ideas separate and focus on the problem. They may be subjective and focus on building relationships, or they may be objective and focus on standards, expectations, and outcomes (Treffinger et al., 2007). The end points of the WD continuum represent the well-defined problem solving styles: Person and Task. A Moderate WD may be patient, have empathy for the opposite style, and choose a balanced approach depending on motivation, the situation, or the flow of information (Treffinger et al., 2007). For example, a Moderate Person may address relationships, but he or she may demonstrate an understanding of the benefits of objectivity and a willingness to take a logical course of action. A Moderate Task may address options logically and objectively, but he or she may defer judgment, consider others, and seek consensus (Treffinger et al., 2007).

Implications for problem solving. Individual style preferences on each of the three dimensions of the problem-solving style model will influence individuals' approaches "to solving problems and managing change" (Treffinger et al., 2007, p. 4). Individual style preferences have strengths and limitations, which vary within a group depending on the collective dimension preference of the group (Treffinger et al., 2007, p. 14). Understanding one's own "problem-solving style preferences and the problem-solving style preferences of other members of a work group" (Treffinger et al., 2007, p. 30) may support group members' (a) individualized opportunities for growth and development; (b) progress to achieve the group's goals; and (c) improved working relationships with others (Treffinger et al., 2007). These types of support are deemed necessary to effectively and efficiently implement educational reforms.

Literature Review on Educators and Problem Solving

In an effort to demonstrate how the capabilities of leaders shape their practices, and how these practices impact student learning, Robinson (2010) proposed a model based on published empirical research and theory to integrate knowledge and relationships in a problem solving context. The model has three interrelated "capabilities required to engage in effective instructional leadership" (Robinson, 2010, p. 3): (a) content knowledge (Stein & Nelson, 2003), (b) solving complex problems (Leithwood & Steinbach, 1995), and (c) building relational trust (Bryk & Schneider, 2002). A capability is more than just knowledge, skills, and dispositions; it is "a seamless and dynamic integration of knowledge, skills, and personal qualities" (Robinson, 2010, p. 3). Content knowledge is the leader's knowledge of subjects and how students learn. It captures pedagogy, curricula, and administrative decision-making related to teacher evaluation and selection of instructional

resources. Solving complex problems relates to how the leaders use their content knowledge and their problem solving ability to solve ill-structured problems. Relational trust involves interpersonal respect, personal regard for others, competence, and personal integrity.

According to Robinson (2010), effective instructional leaders know how to use their content knowledge, their problem solving ability, and their interpersonal skills to build relational trust in their community and solve school-based problems (Robinson, 2010).

Problem solving style. Literature on problem solving style is limited, but growing. For example, in an exploratory study Isaksen and Geuens (2007) examined the relationships between the dimensions of problem solving style (Treffinger et al., 2007) and the preference for learning and using the most current CPS Version 6.1TM (Treffinger et al., 2007). They invited 134 subjects who had completed three-day training in an Igniting Creative Potential (ICP) course based on the current version of CPS. The course introduced each individual to 17 creative problem solving tools, four generating and four focusing guidelines, and eight stages of the creative problem solving process (Isaksen & Geuens, 2007). Eighty nine subjects received the training from the Creative Problem Solving Group (CPSB) and the remaining 45 individuals received the training from the US Department of Defense (DOD). All trainers used the same course design (Isaksen & Geuens, 2007). Eighty one individuals (36 females, 45 males) participated in the study: (a) 51 out of 89 from the CPSB and (b) 30 out of 45 from the DOD subjects. The females had a mean age of 39 and the males had an average age of 45 (Isaksen & Geuens, 2007). The CPSB participants were managers who were involved in research and development and in facilitating meetings at their companies. The DOD participants were involved in a Lean-Six Sigma change effort in the US Army Materiel Command (Isaksen & Geuens, 2007). The participants had completed *VIEW*: An

Assessment of Problem Solving Style (Selby, Treffinger, Isaksen, & Lauer, 2004) during their training. Upon participation in the study, they completed a 33-item survey related to the extent to which they enjoyed learning and used the current version of CPS (Isaksen & Geuens, 2007). *VIEW* was used to assess individuals' preferences for problem solving along the three dimensions: OC (E-D), MP (E-I), and WD (P-T). The survey was designed by Isaksen and Geuens (2007), with each item on a 5-point Likert scale. The survey was used to assess participants' enjoyment of learning (1 = Hated it; 2 = Disliked it; 3 = Neutral; 4 = Liked it; 5 = Loved it) and use of CPS tools, guidelines, and stages (1 = Never; 2 = Rarely; 3 = Sometimes; 4 = Frequently; 5 = Very often). The authors analyzed the data in three One-Way MANOVAs, one for each dimension of *VIEW*. For Orientation to Change, they found that there were significant differences in the scores on enjoyment for learning and use of CPS between the Explorer and Developer problem solving styles, Wilk's $\lambda = .01$, $F(16, 55) = 338.16$, $p < .0001$ (Isaksen & Geuens, 2007). Explorers reported significantly higher levels of enjoyment for learning: (a) the generating and focusing guidelines; and (b) Understanding the Challenge, and Planning Your Approach components of CPS. The participants who preferred the Explorer problem solving style also reported significantly higher levels of use for: (a) the generating and focusing tools and guidelines; and (b) Understanding the Challenge, Preparing for Action, and Planning Your Approach components of CPS (Isaksen & Geuens, 2007). For Manner of Processing, there were no significant differences in the scores on enjoyment for learning and use of CPS between the External and Internal problem solving styles (Isaksen & Geuens, 2007). For Ways of Deciding, there were significant differences in the scores on enjoyment for learning and use of CPS between the Person and Task problem solving styles Wilk's $\lambda = .01$, $F(16, 55) = 328.87$, $p < .0001$ (Isaksen &

Geuens, 2007). The participants who preferred the Task problem solving style reported significantly higher levels of enjoyment for learning the generating guidelines and the Generating Ideas component of CPS. The Task-oriented participants also reported significantly higher levels of use for: (a) the generating and focusing tools, and (b) Generating Ideas and Planning Your Approach components of CPS (Isaksen & Geuens, 2007).

Although the subjects in Isaksen's and Geuens' (2007). study were business managers and members of the US Army, the study was selected for review because it used *VIEW* to assess the problem solving styles, and it examined the relationships between these styles and individual preferences for learning and using CPS.

In another study, Shaw, Selby, and Houtz (2009) claimed that "individuals with particular style preferences would place greater value on elements of their problem solving environments consistent with those preferences" (p. 395). The authors used two instruments to collect data for their study: (a) *VIEW: An Assessment of Problem Solving Style* by Selby et al. (2004), and (b) *Principles of Learning, Teaching, and Problem Solving (PLTPS)* by Shaw et al. (2009). *VIEW* was used to assess individuals' preferences for problem solving along the three dimensions: OC (E-D), MP (E-I), and WD (P-T). The PLTPS was used to assess the participants' level of agreement of the importance of the principles of learning, teaching, and problem solving. The researchers asked 74 pre-service teachers (57 females and 17 males) in an urban graduate school of education to participate. Participants independently completed *VIEW* and returned the completed inventory a week later. Two or three weeks later, they were asked to complete the PLTPS in class. Participants received a printout of their individual *VIEW* profiles. Shaw and Selby categorized the principles by

each of the six *VIEW* styles (E, D, E, I, P, T), and referred to the PLTPS styles “as PR-Explorer, PR-Developer, PR-External, PR-Internal, PR-Person, and PR-Task” (p. 395). Shaw et al. (2009) used a correlational research design for the whole group to examine the relationship between age, gender, the three dimensions of *VIEW*, and the six styles of the PLTPS. They found out that the sample’s OC score was significantly ($p < .001$) higher than that reported in Selby et al. (2007), “indicating a more Developer-oriented group of individuals” (p. 396). There was no significant difference between the sample’s MP score and that reported in Selby et al. (2007). The sample’s WD score was significantly ($p < .001$) lower than that reported in Selby et al. (2007), “indicating a more Person-oriented group of individuals” (p. 396). They further found out that gender was significantly ($p < .05$) correlated with the *VIEW* dimension of Ways of Deciding; males tended to prefer the Task style over the Person style. Shaw et al. (2009) also used a causal comparative research design with intact groups based on preference for problem solving. Using three One-Way MANOVAs, Shaw et al. (2009) defined each *VIEW* dimension as a dichotomous variable representing the independent variable for each MANOVA, and the corresponding PLTPS style scores as the dependent variables. Participants scored significantly higher on all *VIEW* dimensions than on PLTPS scales except for WD. Problem solving style as measured by *VIEW* appeared “to correlate with pre-service teacher beliefs” (Shaw et al., 2009, p. 398) as measured by PLTPS. It was not clear if one problem solving style was “more effective than another in a classroom” (p. 397) because of the complex and dynamic nature of the classroom environment.

Although the participants in this study (Shaw et al., 2009) were pre-service teachers, the study was selected for literature review because it used *VIEW* to assess the problem

solving styles of future educators, and it addressed the relationship between the participants' gender and *VIEW* dimensions: OC (E-D), MP (E-I), and WD (P-T).

Educators and Demographic Characteristics

Because the researcher examined the relationship between educators' problem solving style, gender, years of experience, and type of certificate in the second research question, she included in the sections below a review of how the current literature incorporated demographic characteristics of educators. Specifically, she reviewed the literature on gender, years of experience, and type of certificate.

Gender

Gender was the only demographics characteristic that was addressed in the existing literature in relation to each of the two constructs, leadership and problem solving style.

Gender and leadership. Eagly, Johannesen-Schmidt, and Van Eagen (2003) conducted a meta-analysis of 42 studies on 45 published and unpublished data sets from different countries (United States, 53%; Canada, 11%; other English-speaking country, 16%; non-English-speaking European country, 7%; mixed, 13%) and from different types of organizations (business, 31%; educational, 33%; governmental or social service, 7%; health care or sports, 7%; mixed or unknown, 22%). These research papers were reported in 1985 through June 2000 (Eagly et al., 2003). The authors examined gender differences in transformational, transactional, and laissez-faire leadership styles, and evaluated these differences as assets or barriers to women who seek to rise in hierarchies of power and influence. They selected a study if the sample size exceeded five leaders of either female leaders or male leaders, and if the leaders represented a homogeneous population (Eagly et al., 2003). They framed their expectations about leadership styles in terms of the social role

theory approach to leadership behavior. In other terms, gender roles influence leaders' behavior (Eagly et al., 2003). For the purpose of the current study, the researcher focused on Eagly et al.'s (2003) meta-analysis as related to gender differences in leadership.

Eagly et al. (2003) coded the selected reports on various characteristics, and related these characteristics to the effect sizes that represented gender differences and similarities in transformational leadership style, which they found to be dominant in most studies. These characteristics included: (a) report-related variables, such as year of publication, source of publication, gender of first author, percentage of men among the authors, gender as part of the title, type of the organization, and size of the organization; (b) leader-related variables, for example nationality, average age, level of leadership, description of role, selection of leaders, training of leaders, percentage of men in leader role, percentage of men in subordinate roles, confounding of leader gender with individual variables such as age, and confounding of leader gender with institutional variables such as level of leadership; and (c) leadership style measures including identity of raters, basis of selection of raters, aggregate measures by gender, and reliability of leadership style measures (Eagly et al., 2003). They calculated the study-level effect sizes to determine whether male and female leaders differed in their leadership styles. They defined the effect size as “the difference between the leadership style of the male and female leaders, divided by the pooled standard deviation” (Eagly et al., 2003, p. 575). A positive effect size indicated that male leaders scored higher than female leaders on a leadership style, and a negative effect size indicated that female leaders scored higher than male leaders on that style (Eagly et al., 2003). They found that female leaders were more transformational than male leaders in their leadership style on the transformational subscale and four of its components: (a) idealized influence (attribute), (b)

inspirational motivation, (c) intellectual stimulation, and (d) individualized consideration. Female leaders also scored higher than male leaders on the first subscale of the transactional leadership, Contingent Reward. However, male leaders scored higher than female leaders on the other subscales of transactional leadership, management by exception (active) and management by exception (passive), and on the laissez-faire scale (Eagly et al., 2003).

Because the current research used aggregate scores for transformational, transactional, and passive/avoidant leadership, as produced by the MLQ, the researcher focused on the results related to the aggregate scores in Eagly et al. (2003).

Fridell, Belcher, and Messner (2009) applied discriminate analysis to determine if there were any significant statistical differences on principals' leadership styles between genders in three Midwestern states. The participants consisted of 265 male and 180 female principals who received an e-mail based survey. The survey consisted of the Servant-leadership Styles Inventory (SSI) and 11 demographic questions. The SSI had a total of 40 items: (a) 20 items on traditional or top-down leadership, and (b) 20 items on servant or emotionally intelligent leadership style. Each item was on a 5-point Likert scale with Cronbach's alpha of .65 to .87 (Fridell et al., 2009). The principals who scored between 60 and 69 were identified as traditionalists or servant-leaders. Those who scored between 70 and 79 were identified as strong traditionalists or strong servant-leaders (Fridell et al., 2009). Using *t*-test analysis, the authors showed that there was a significant difference on the servant-leadership scores ($t = 6.39, df = 433, p = .00$) between men ($M = 67, SD = 5.28$) and women ($M = 70, SD = 5.24$; Fridell et al., 2009). There were no significant differences for gender on the traditional-leadership scores. Both genders scored low on the traditional-leadership, and "were determined to be weak traditional leaders" (Fridell et al., 2009, p. 729).

Because the current study used the MLQ to assess educators' leadership styles (*transformational, transactional, passive/avoidant*), Fridell's et al. (2009) study had its implications on the current study in terms of gender differences in educators' leadership styles, specifically the transactional leadership style.

Gender and problem solving style. Selby, Treffinger, and Isaksen (2007) examined the relationships between gender and the dimensions of *VIEW: An Assessment of Problem Solving Style* that they developed and refined over time from 2001 through 2004. They administered their 34-item, three dimensional, instrument to individuals in different sectors, such as business ($n = 4,117$), K-12 education ($n = 1,114$), higher education ($n = 766$), religious organizations ($n = 48$), government ($n = 89$), and other nonprofit organizations ($n = 301$). As of December 2005, their data base consisted of 10,151 participants including 4,316 male and 5,723 female respondents. The remaining 112 respondents did not report their gender (Selby et al., 2007). The authors (2007) used descriptive statistics for the whole database and for the individual sectors. They examined the relationships between age, gender and *VIEW's* three dimensions for the whole group. The relationships between age and the dimensions were not relevant to the current study, and so they were not reported.

For the whole group, Selby et al. (2007) found that gender was significantly correlated with the first dimension, Orientation to Change ($r = .14, p < .01$; Selby et al., 2007). The relationship was weak, however, gender significantly contributed to 2% of the variance in Orientation to Change. Females demonstrated a preference for the Developer problem solving style. Gender also was significantly correlated with the third dimension, Ways of Deciding ($r = -.31, p < .01$; Selby et al., 2007). Gender accounted to 10% of the variance in Ways of Deciding. Male respondents indicated a preference for the Task

problem solving style. Gender was not a significant predictor of the second dimension, Manner of Processing ($r = .06$; Selby et al., 2007).

Selby et al. study (2007) was included in the review because it utilized *VIEW* to assess educators' problem solving styles, and resulted in gender relationship with each of *VIEW*'s three dimensions.

Years of Experience

Ohlson (2009) examined the relationship between the predictor variables of teacher quality characteristics and school culture, using the criterion variables of student attendance and suspension rates. Ohlson (2009) defined these characteristics as the average years of teaching within a school, the percentage of classes taught by out of field teachers, and the percentage of teachers with advanced degrees for each school (Ohlson, 2009). The teachers' perceptions of the school culture were assessed using a School Culture Survey. The survey measured six factors: (a) collaborative leadership, (b) teacher collaboration, (c) unity of purpose, (d), professional development, (e) collegial support, and (f) learning partnership. The factors had 4 to 11 questions, each on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree; Ohlson, 2009). In the data analysis, Ohlson (2009) used the survey data averages of all teachers who participated at a school. The absence rate represented the percentage of students who were at least 21 days absent, and the suspension rate reflected the percentage of students who had out of school suspensions during the school year per classroom (Ohlson, 2009). These rates were reported in the School Indicator Report as per the Florida Department of Education. Ohlson (2009) sent the surveys to schools in different districts throughout Florida in the spring of 2007. He selected 23 urban public elementary schools that were participants in the Lastinger Center for Learning at the University of

Florida. These schools received comprehensive and continuous support from the Center in order to enhance teacher efficacy and to improve student achievement (Ohlson, 2009).

Teachers' participation in the study was voluntary. Each participant completed a survey on school culture and teacher characteristics. With a response rate of 85%, and the school as the unit of analysis, there were 23 data points (Ohlson, 2009).

Using a stepwise multiple regression, with the teacher quality characteristics and the survey factors as the predictor variables and the student absences as the criterion variable, Ohlson (2009) found that the unity of purpose and the collaborative leadership factors were significant predictors of the absence rate ($F(2, 20) = 7.82, p < .01$), and the model significantly accounted for 43.9% of the variance in the students' absence rate. An increase in the unity of purpose by 1-Likert-scale point would decrease the student absences by 23.56%. An implication would be that with the unity of purpose all stakeholders understood a shared vision and aligned their actions with the shared goals. More specifically, students would attend school (Ohlson, 2009). On the contrary, an increase in collaborative leadership by 1-Likert-scale point would increase the student absences by 17.27%. It was not clear whether the underlying factor was a competing priority between collaborative leadership and managing discipline at the school, or it was a limitation due to the characteristics of the participating schools (Ohlson, 2009).

Running another stepwise multiple regression with the same predictor variables and the out-of-school suspension rate, Ohlson (2009) reported that the collaborative leadership factor and the teachers' average years of experience were significant predictors of the out-of-school suspension rate ($F(2, 18) = 26.81, p < .01$). The model significantly accounted for 74.9% of the variance in the students' out-of-school suspension rate (Ohlson, 2009). An

increase in the average number of years of experience by 1-Likert-scale point would decrease the number of school suspensions by .41%. The results indicated that the teachers with more experience would deal with discipline issues in their classrooms in ways better than those that would result in out of school suspensions. These teachers would use effective instructional strategies to engage the students, and therefore to improve student achievement (Ohlson, 2009). Furthermore, an increase in collaborative leadership by 1-Likert-scale point predicted a decrease in the number of school suspensions by 4.81%. The collaborative relationships between administrators and teachers would help resolve discipline issues before they become severe or result with an out of school suspension (Ohlson, 2009).

This study was selected for literature review because of its implications on the current study. For example, the teachers with more years of teaching experience would demonstrate leadership behaviors that impact teaching and learning. The unity of purpose and collaboration among educators would strengthen the school culture, and hence improve teaching and learning (Ohlson, 2009).

Highest Degree Earned and Type of Certificate

Valentine and Prater (2011) examined the relationships between school demographics, the principal demographics, demographics related to principals and the leadership styles (managerial, transactional, and transformational) of principals as perceived by the teachers, and the impact of principal leadership on student achievement on standardized high-stakes tests in public high schools. Valentine and Prater (2011) invited 313 urban, suburban, and rural public high schools in Missouri by email to participate in their study if the school principals had been at their sites for at least 3 years. Only 155 principals were willing to participate, and provided the email addresses of their science, mathematics,

social studies, and communication arts teachers who have been teaching for a minimum of 3 years during the principal's administration. A sample of 1,038 teachers was randomly selected using stratified proportionate sampling based on the number of content area teachers. Only 443 teachers from 131 schools responded with usable responses. The study involved a one-time data collection using two instruments: (a) the Audit of Principal Effectiveness (APE) by Valentine and Bowman (1988) and (b) the Principal Leadership Questionnaire (PLQ) by Jantzi and Leithwood (1996). In addition, the average scores of three years' standardized testing as measured by the Missouri Assessment Program (MAP) in Math and Science (Grade 10) and Communication Arts and Social Studies (Grade 11) were used. The APE focuses on *interactive processes, instructional improvement, and curricular improvement* of principal managerial and instructional leadership, with reliability coefficients (Cronbach's alpha) ranging from .86 to .92. The PLQ measures principals' transformational leadership on six factors: (a) *identifying and articulating a vision*, (b) *providing an appropriate model*, (c) *fostering the acceptance of goal groups*, (d) *providing individual support*, (e) *providing intellectual stimulation*, and (f) *holding high performance expectations*, with the lowest reliability coefficient (Cronbach's alpha) of .73 for *holding high performance expectations*, and the highest of .88 for *identifying and articulating a vision*. There was a significant correlation between the principal's educational level and each of the leadership factors: (a) *interactive processes* ($r = .227, p = .009$), (b) *instructional improvement* ($r = .285, p = .001$), (c) *curricular improvement* ($r = .335, p = .001$), (d) *developing vision* ($r = .285, p = .001$), (e) *modeling* ($r = .217, p = .0125$), (f) *fostering goals* ($r = .280, p = .001$), (g) *providing support* ($r = .223, p = .010$), (h) *providing stimulation* ($r = .299, p = .001$), and (i) *high expectations* ($r = .271, p = .002$). The principal's education level contributed

significantly to the prediction of the language and arts scores ($p = .028$), the science scores ($p = .036$), and the social studies scores ($p = .048$), but not to the math scores. The average SES of students contributed significantly to the prediction of the math scores ($p = .001$), the science scores ($p < .001$), and the social studies scores ($p = .028$), but not to the language and arts scores. The principal's gender was the only significant predictor of the social studies scores ($p = .016$). The high schools whose principals were perceived as competent scored significantly ($p < .05$) higher on instructional leadership (*instructional improvement, curricular improvement*) and transformational leadership (*identifying a vision, providing model, fostering goals*) than all other schools whose principals were not perceived as competent.

Valentine's and Prater's (2011) study related to the current study because it explored the relationship between the demographic characteristics of principals and their leadership styles. In particular, the study distinguished between instructional leadership and transformational leadership, and how the principals' gender and educational level would predict their leadership styles.

Research Questions

The theoretical frameworks, whether they are transactional (Hallinger & Murphy, 1987), transformational (Leithwood, Jantzi, & Steinbach, 1999), or both, implicitly assume that the instructional leader is an individual who holds a formal leadership position and who decides how to lead or improve instruction (Reitzug et al., 2008; Ruff & Shoho, 2005). Based on these frameworks, researchers attempted to define instructional leadership in specific contexts (Bays & Crockett, 2007), within a teacher evaluation system (Ovando & Ramirez, 2007), or in relation to teachers' professional development (Blasé & Blasé, 1999;

Graczewski et al., 2009). Spillane et al. (2003) was unique in a way that it examined teachers' perceptions of instructional leaders regardless of a position or a role. The freedom that Spillane et al. (2003) gave the teachers to identify forms of capital as a basis for instructional leadership provided a different perspective of what instructional leadership would be. It indicated that instructional leadership is not attached to a formal position or a role. It is multidimensional. It encompasses the people, the process, and the outcomes (Ohlson, 2009). The people involved are the educators, principals and teachers. Their personal characteristics, including knowledge and skills, determine their competencies. The process could be portrayed as interactions among these educators and how they connect with each other. The outcomes are the expectations based on pre-set goals. These goals focus on student learning, which is the core of education.

The current education programs and the States' requirements of a principal or a teacher ensure that the educator has met the requirements to fulfill a specific position. Nevertheless, individuals have different preferences on how to interact with others. In particular, they have consistent individual preferences on how to solve the problems that may arise during their interactions with others in order to achieve their shared goals.

The two constructs, educators' problem solving styles and leadership styles to improve curriculum, instruction, and learning, are the basis for this research. Consequently, the researcher addressed three questions related to educators' leadership and problem solving styles:

1. Is there a significant difference in scores on the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*) between educators based on their preferences for problem solving styles produced by the three *VIEW* dimensions (*OC*: E-e-d-D; *MP*: E-e-i-I; and *WD*: P-p-t-T)?
 - a. Is there a significant difference in scores on the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*) between educators who prefer the well-defined Explorer (E), moderate Explorer (e), moderate Developer (d), or well-defined Developer (D) Problem-Solving Style?
 - b. Is there a significant difference in scores on the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*) between educators who prefer the well-defined External (E), moderate External (e), moderate Internal (i), or well-defined Internal (I) Problem-Solving Style?
 - c. Is there a significant difference in scores on the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*) between educators who prefer the well-defined Person (P), moderate Person (p), moderate Task (t), or well-defined Task (T) Problem-Solving Style?
 - d. Are there significant interactions among the three *VIEW* dimensions (*OC*, *MP*, *WD*) for the three leadership styles (*transformational*, *transactional*, and *passive/avoidant*)?
2. To what degree and in what manner are the types of leadership produced by the MLQ (*transformational*, *transactional*, and *passive/avoidant*) each predicted by the dimensions of problem solving style (*OC*, *MP*, and *WD*), gender, years of teaching experience, highest degree earned, and type of certificate?

3. What are the perceptions of educators regarding their leadership and problem solving in K-12 settings?

Chapter Summary

This chapter summarized the theoretical background of the two constructs, instructional leadership and problem solving style. It provided an overview of the role of educational reforms in K-12 leadership, a description of the search process, a synopsis of current research on both constructs, research related to educators' characteristics, and the research questions that the researcher addressed.

Instructional leadership was examined in different contexts, with the majority of the research focusing on the role of the principal as the instructional leader. Leadership educational organizations described instructional leadership in terms of the individual's skills, knowledge, and dispositions. They related the description to a formal position of an educator. The term instructional leader has been used to refer to the school leader, and the term teacher leader or coach leader to recognize the teacher who demonstrates leadership behaviors outside the classrooms. Instruction is the core business of a school and should not be tied to a formal position or to one individual. Instructional leadership focuses on improving curriculum and instruction, and therefore, it is the responsibility of all educators, teachers and administrators (Hoy & Hoy, 2003). Although the previously reviewed literature focused on the principal's role as the instructional leader, it was often implied that the principal could not lead instruction if he or she did not collaborate with the teachers. New concepts of instructional leadership such as distributed instructional leadership evolved over time to embrace collaboration between and among educators. Emphasis shifted to collaborative efforts that would promote adult learning, coaching relationships, reflection,

creativity, innovation, and professional growth to improve teaching and instruction (Blasé & Blasé, 1999; Leithwood & Jantzi, 1994). Promoting professional development, whether it is an individual or a collaborative effort, is the heart of Hallinger's and Murphy's (1987) instructional leadership dimension, promoting a positive school learning climate. Other leadership practices such as holding high performance expectations, providing intellectual stimulation and shared decision making are key dimensions in Leithwood's (1994) transformational leadership framework.

Problem solving style was grounded in 50 years of research and in theories on psychological type, learning style, cognitive style, creativity, and creative problem solving. Understanding individual problem solving styles would support an individual's opportunity for growth and development, achievement of the group's goals, and improved relationships with others (Treffinger et al., 2007). Its applications have been of interest to researchers in diverse business and educational settings to better understand individual problem solving preferences and achieve desired organizational goals.

Educational reforms were transformational in nature and sought innovation and school improvement programs. They required the States to adopt common rigorous curriculum standards in order to improve student achievement on standardized tests, and to evaluate teachers based on student achievement. As a result, they influenced leadership in K-12 educational settings, and impacted curriculum, teaching and learning, and educators' practices in the classroom. These reforms were the catalyst for this study to better understand educators' leadership styles in light of their problem solving styles.

CHAPTER THREE: METHODOLOGY

The researcher explored leadership and problem solving styles through the perceptions and preferences of K-12 educators. A description of the setting and subjects is followed by data collection procedures and timeline, a description of the instruments, the research questions and hypotheses, an explanation of the research design and type of data analysis, limitations of the study, and statement of ethics and confidentiality.

Description of the Setting and Subjects

To ensure an adequate sample size for the procedure, the researcher conducted two waves of data collection in 2010 through 2013. In the first wave she invited 115 educators, both teachers and administrators, who were past and current students from six cohorts of a doctoral program in Instructional Leadership to participate. In the second wave of data collection, the researcher contacted superintendents from four districts in two of the university's neighboring counties and invited district educators, including staff members, teachers, and administrators, to participate in the study. If any of the doctoral students were educators at a participating school, they were asked to not participate. The districts were selected because of their convenient locations to the university.

Setting

Doctoral program. Doctoral programs that grant degrees in instructional leadership are rare. A recent search located fewer than 20 in the country. The program at the selected university is designed to prepare doctoral candidates who are educators to strengthen their knowledge, skills, and dispositions as they lead reform efforts in their current settings. The program began in 2003 and has admitted six cohorts of doctoral students, one cohort every other year for a total of 119 past and current students. The students hold education positions

in neighboring towns and cities. They represent a wide range of educators such as teachers, school counselors, assistant principals, and principals. The accessible population was 115 PK-12 teachers and administrators. The cohorts ranged in size from 14 to 22. An approximate 89% of the doctoral students in the program were Caucasian/Non-Hispanic, and two-thirds of the students were females.

Local communities. District A is located in a rural town, districts B and C are located in suburban towns, and district D is located in an urban area. The student populations of these districts range in size from 968 to 10,186 (CSDE, n.d.), with an average class size ranging from 10.41 to 15.24 students per teacher, 0.9% to 18.9% of the students not fluent in English, 4.9% to 32.6% of the students eligible for free and reduced lunch, and 10.7% to 13.61% of the students receiving special education services. The accessible population of the four districts consisted of 1,448 K-12 educators. This population is representative of the State's full-time equivalent certified staff by assignment type. Refer to Appendix A for a detailed description of the characteristics of the participating districts.

Subjects

Doctoral program – Wave 1. For Wave 1, 115 doctoral students (males, 32.8%; females, 66.4%) were contacted by email or during their graduate classes. The researcher provided a cover letter and an Informed Consent Form. It was clear in the consent form that participation was voluntary. The students who were willing to participate in the study returned the signed consent form to the doctoral program coordinator. The participants did not receive inducements before or rewards after the study. The surveys were either mailed to graduates or were administered by a graduate assistant to current doctoral students during classes.

Local communities – Wave 2. For Wave 2, the surveys were administered at three schools from District A, three schools from District B, four schools from District C, and two schools from District D. Some school administrators scheduled visits during their faculty meetings. Other administrators in these schools said that they had tight schedules and could not spare such times for surveys. They invited the researcher to administer the questionnaires to their staff members during after-school hours in their media center or cafeteria. They announced this opportunity to their staff at the end of the school day and encouraged them to participate. In effect, only interested staff showed up to complete the questionnaires. The researcher had to reschedule meetings at these schools because of unplanned disasters (school closings as a result of Hurricane Sandy, reassessment of school policies after the killing of 26 children and educators at a local school, and/or changes in leadership at one district), tight schedules for faculty meetings (initiating the Common Core State Standards), professional development workshops, or meetings for their professional learning communities (PLCs).

The researcher's meetings at these schools were voluntary for their staff members. Most of these participants indicated that they learned about the study from their district's administrators. They were interested in the research because it focused on their perceptions, and they wanted to help a student in a doctoral program. A few others wanted to participate and receive copies of their profiles.

Response rate. Out of 115 doctoral students who were invited to participate, 99 students signed and returned the Informed Consent Forms. Ninety-seven participants (males 34.0%; females, 66.0%) completed the questionnaires, yielding an 84.35% response rate. However, two records were removed: one because the individual's current role was in higher

education and the other because the participant had the same response for all items on the MLQ. As a result, 95 records from Wave 1 data collection were included in data analysis.

In Wave 2, a total of 281 participants (210 females, 70 males, and one undeclared) out of 1,448 full-time equivalent certified staff members completed the questionnaires during prescheduled meetings at their schools. Nevertheless, eight records were removed: one record (3405) was for a student teacher and the remaining seven (3387, 3388 – 3390, 3419, 3420, and 3458) were for student observers from a local university. The number of participants in the voluntary meetings during after school hours ranged between 3 and 12, and the number of participants in the faculty meetings extended from 25 to 88. The high participation rate in these meetings was possibly a result of various motives. Such motives may include: (a) school administrators' willingness to use the allocated faculty meeting time for survey administration; (b) their interest to encourage their staff to participate in the study; and (c) their interest to learn about their schools in areas of leadership and problem solving for future professional development planning. The low response rate was probably due to administering the survey at the end of the faculty meeting after school, the absence of educators attending an out-of-district conference, and conflicting schedules as some educators explained.

The responses from each school visit were counted and tallied by district. The response rates by grade levels for each district and the aggregate response rates for the four districts were then calculated, and were summarized in Table 6. Overall, the participants in the study from Wave 2 represented 18.9% of the accessible population, with the highest participation of 27.2% at the secondary level and the lowest participation of 10.4% at the elementary level.

Table 6

Wave 2 Accessible Population and Participants' Percentage of Population by Grade Level

Grade Level	District A			District B			District C			District D			Total		
	<i>N</i>	<i>n</i>	%	<i>N</i>	<i>n</i>	%	<i>N</i>	<i>n</i>	%	<i>N</i>	<i>N</i>	%	<i>N</i>	<i>n</i>	%
PreK – 5	38	7	18.4	97	3	3.1	116	57	49.1	393			644	67	10.4
6 - 8	31	3	9.7	60	3	5.0	63	9	14.3	183	71	38.8	337	86	25.5
9 – 12	38	4	10.5	87	7	8.0	98	78	79.6	218	31	14.2	441	120	27.2
District	4			3			5			14			26		
Total	111	14	12.6	247	13	5.3	282	144	51.1	808	102	12.6	1,448	273	18.9

Note: The accessible population is determined from each district's school strategic profile (State Department of Education, n.d.).

Description of the sample. Table 7 provides a description of the sample characteristics for Wave 1, Wave 2, and the aggregate data for both waves. The sample consisted of 368 participants (72.8% female, 26.9% male) with the majority being Caucasian-American (89.9%) as compared to the State's total number of educators (75.5% female, 24.5% male, and 92.2% Caucasian). The participants have held teaching or administrative positions from 1 to 44 years of experience in rural (3.8%), suburban (42.6%), and urban (27.7%) K – 12 educational settings. About 81.5% had a master's degree or 6th year certificate, and 18.2% had an administrative certificate at the time the data were collected. Refer to Table 8 for demographic and additional characteristics of the participants.

Table 7

Characteristics of the Sample

Setting	Doctoral Program (<i>n</i> = 95)		Local Communities (<i>n</i> = 273)		Sample (<i>n</i> = 368)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Grade Level						
PreK – 5	30	31.58	55	20.15	85	22.61
6 – 8	19	20.00	74	27.11	93	24.73
9 – 12	28	29.47	104	38.10	132	36.44
Across grades	8	8.42	5	1.83	13	3.46
District	2	2.11			2	.53
N/A	8	8.42	35	12.82	43	12.23
School System						
Rural			14	5.13	14	3.80
Suburban			157	57.51	157	42.66
Urban			102	37.36	102	27.72
Doctoral Program	95	100.00			95	25.82

Table 8

Characteristics of the Participants

Characteristic	Doctoral Program (<i>n</i> = 95)		Local Communities (<i>n</i> = 273)		Sample (<i>n</i> = 368)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Gender						
Male	33	34.74	66	24.18	99	26.90
Female	62	65.26	206	75.45	268	72.83 ^a
N/A			1	.37	1	.27
Ethnicity						
Caucasian	86	90.53	245	89.75	331	89.95
Other	9	9.47	26	9.52	35	9.51
N/A			2	.73	2	.54
Years of Experience						
1-5 years	3	3.16	60	21.98	63	17.12
6-10 years	23	24.21	75	27.47	98	26.63
11-15 years	25	26.31	58	21.25	83	22.55
16-20 years	22	23.16	22	8.06	44	11.96
21+ years	22	23.16	56	20.51	78	21.20
N/A			2	.73	2	.54

(continued)

Table 8

Characteristics of the Participants

Characteristic	Doctoral Program (<i>n</i> = 95)		Local Communities (<i>n</i> = 273)		Sample (<i>n</i> = 368)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Role						
Teacher	23	24.21	235	86.08	258	70.10
Administrator	19	20.00	12	4.39	31	8.42
Teacher/Adm.	25	26.32	1	.37	26	7.06
Specialist	26	27.37	1	.37	27	7.33
Support Staff	2	2.11	23	8.42	25	6.79
N/A			1	.37	1	.30
Highest Degree Earned						
BA/BS	0	0.00	38	13.92	38	10.33
MA/MS	73	76.84	181	66.30	254	69.02
6 th yr	2	2.11	44	16.12	46	12.50
PhD/EdD	20	21.05	5	1.82	25	6.79
Other			4	1.47	4	1.09
N/A			1	.37	1	.27
Certificate						
Non-Admin.	57	60.00	244	89.38	301	81.79
Admin.	38	40.00	29	10.62	67	18.21

Note. ^aStatewide female teachers represent 75.5% of the teacher workforce (CSDE, 2011).

Reasons for Non-participation

A total of 32 non-participation forms were completed: (a) 28 educators from District D High School indicated that they did not have time to complete the questionnaires on site or that they had a prior engagement or a meeting in their professional learning communities; (b) three individuals from District C High School indicated that they were student observers from a local university and did not qualify to participate in the study; and (c) one police officer from District D Middle School explained that the nature of his or her assignment impacted their decision to decline to participate.

Data Collection Procedures and Timeline

Data Collection Procedures

Upon the Institutional Review Board's (IRB) approval in 2010, the researcher contacted Wave 1 potential participants and initiated the consent and data collection processes from 2010 till 2013, with 2 waves of participants being contacted for the study. Participants who were contacted via email received a follow-up reminder after a one-week period. The coordinator of the doctoral program at the university provided an e-mail list of graduates of the program as well as present students. Graduates were contacted by email. It was clear in the email and the consent form that participation was voluntary. A follow-up email was sent later as a reminder. The graduate students who participated in the study emailed the signed consent form back to the program coordinator. Those who agreed to participate were then sent a packet in the mail with the directions and the surveys. Current students completed the assessments in class as it was arranged with the classroom professor. The assessments were administered by a graduate assistant. The students willing to participate each received a coded packet, a cover letter, and an envelope for the return of the

completed informed consent and the questionnaires. Refer to Appendix B for a copy of Wave 1 informed consent. The questionnaires included a researcher-created survey, the Multi-Factor Leadership Questionnaire (MLQ) leader form, and *VIEW: An Assessment of Problem Solving Style*. Refer to Appendix C for the items included in Wave 1 researcher-created survey. The students who were not willing to take the assessments left the classroom during testing. The participants did not receive inducements before or rewards after the study.

A total of 95 educators had completed the three surveys. This sample was not large enough for the 3-Way MANOVA and multiple linear regression procedures planned for the study. In a MANOVA, it is necessary that the number of cases in every cell to be greater than the number of dependent variables for two reasons (Tabachnick & Fidell, 2013): (a) to be able to test “the assumption of homogeneity of variance-covariance matrix” (p. 254), and (b) to ensure adequate power of the analysis. For an MLR procedure, a sample of size N is required, such that $N \geq 50 + m$, where m is the number of independent variables (Tabachnick & Fidell, 2013). In this study, there is a need for 106 participants because there were seven predictors of leadership scores. Because the researcher plans to use statistical stepwise regression, it is reasonable to have “a cases-to-IV ratio of 40 to 1” (Tabachnick & Fidell, 2013, p. 124) and be able to generalize the findings to similar settings. This implies that a sample size of at least 280 is realistic to offset the loss of potential records with missing values in any of the variables. Therefore, the sample size was not deemed as sufficient and the study was extended to other educators in local schools.

A revised Subjects Research Review Form was submitted to and approved by the IRB in 2012 requesting minor modifications to the original Informed Consent Form and cover

letter. The modifications included extending the invitation to K-12 educators from public school districts in the northeast of the United States, and the opportunity to receive a raffle ticket for a gift card after completion of the three surveys. The researcher then contacted school officials of the accessible population and determined a date and a time to administer the instruments to individuals willing to participate in that school. School contacts and visits for Wave 2 data collection were made in 2012 through 2013. Participation was voluntary. Attendees willing to participate each received a coded packet, a cover letter, and an envelope for the return of the completed informed consent and the questionnaires. Two pieces of paper were attached to the packet with a paper clip: (a) one piece of paper indicated the code of the packet, the researcher's name and email that the participant kept if he or she was interested in receiving a copy of his or her profile by July 2013; and (b) one same-code piece of paper that the participant returned with the completed packet to the researcher to be able to participate in a raffle that would be held at the next school meeting in appreciation of participation in the study. Refer to Appendix D for a copy of the coded pieces of paper. Each packet consisted of the following items: (a) a cover letter, (b) the informed consent, (c) a researcher-created survey, (d) the Multi-Factor Leadership Questionnaire (MLQ) leader form, and (e) *VIEW: An Assessment of Problem Solving Style*. Refer to Appendix E for a copy of Wave 2 informed consent form, and to Appendix F for a copy of Wave 2 researcher-created survey. Participants placed their coded paper in a raffle box to participate in the raffle at the next school meeting. Upon participants' departure from the meeting room, the researcher transferred the raffle tickets to an envelope and handed it to the school principal with the gift cards for the school principal to select the two raffle winners at his or her school. Individuals who declined participation in the study were asked to complete a non-

participation form after they left the meeting room for the researcher to better understand the characteristics of non-participants and their reasons of avoidance. Refer to Appendix G for a copy of the non-participation form.

To maintain confidentiality of information, the consent form and surveys were recorded and separated by a research assistant who was not related to the study. She then recorded the code numbers, the names of the individuals who requested the results of the MLQ and *VIEW*. These data were stored separately so that the researcher could provide a report to each individual at a later time. The researcher inspected every individual record at the time of data entry. First, she ensured that all pages for a single record had the same code. Second, individuals who were not full-time educators were eliminated from the data set, such as student teachers ($n = 1$) and student observers ($n = 7$) from a local university. Third, data were checked for accuracy. For example, the record that was found to have the same response for all items on the MLQ was deleted from the data set in Wave 1. The MLQ is especially sensitive to identifying a response set, since individuals with high transformational scores typically have low responses on the passive/avoidant subscales. All data related to the remaining 368 participants were subsequently entered from: (a) the demographic information, (b) the scores of *VIEW* items and dimensions, and (c) the points of the MLQ items and the means of its subscales. After a total of 8 records were deleted from Wave 2 upon visual inspection of the data at the time of data entry 368 records were retained for data analysis.

Timeline for the Dissertation Process

Upon IRB approval, the research was conducted as follows:

1. The researcher initiated contact with Wave 1 graduate students and visited classes for data collection (Fall 2010 – Fall 2013).
2. A qualified individual input entered data in a spreadsheet (Fall 2010 – Fall 2013).
3. The researcher confirmed districts' and schools' participation by email; chapter one was completed (October 2012 – January 2013).
4. The researcher conducted site visits during scheduled times as approved by the superintendent and the school principals of participating districts (November 2012 – January 2013).
5. The researcher and a qualified individual input collected data in a spreadsheet; Chapters Two and Three were work in process (January 2013 – October 2013).
6. The researcher verified quantitative data, analyzed the statistical results and reported the findings; Chapters Two and Three were revised and chapter 4 was work in process (October 2013 – December 2013).
7. The researcher coded the qualitative data and reported observed themes (January 2014 – March 2014).
8. Triangulated the results of the qualitative data and those of the quantitative data (March 2014).
9. Finalized the dissertation (March 2014 – June 2014).
10. Submitted the final draft of the dissertation to the primary advisor (May 2014).
11. Sent approved copy to secondary advisors, outside reader (with rating form), and program coordinator (June 2014).

12. Submitted PowerPoint presentation to primary advisor for approval (June, 2014).
13. Dissertation defense (July 22, 2014).

Instrumentation

Data were collected using three instruments: (a) the Multi-Factor Leadership Questionnaire (MLQ; Bass & Avolio, 1995, 2000, 2004) leader form, (b) *VIEW*: An Assessment of Problem Solving Style (Treffinger et al., 2007), and (c) a researcher-created survey.

The Multi-Factor Leadership Questionnaire (MLQ)

Developed by Bass and Avolio (1995, 2000, 2004), the MLQ (Form 5X) is used to evaluate the degree to which educators believe they engage in leadership behaviors toward others. The MLQ has 45 items used to measure the nine components of the full-range leadership theory: (a) five *transformational* leadership factors: idealized influence (attribute), idealized influence (behavior), inspirational motivation, intellectual stimulation, and individualized consideration; (b) three *transactional* leadership factors: contingent reward leadership, management by exception (MBE) active, and management by exception passive; and (c) one non-transactional *laissez-faire* leadership. Thirty-six items represent the nine leadership factors and the remaining nine items represent three leadership outcome scales: extra effort, effectiveness, and satisfaction. Each item has a score of 0 (not at all), 1 (once in a while), 2 (sometimes), 3 (fairly often), or 4 (frequently, if not always), and a scale score is the average score for its items. Each leadership factor has four items. The first leadership outcome, extra effort, has three items; the second leadership outcome, effectiveness, has four items; and the third leadership outcome, satisfaction, has two items.

The MLQ leadership factors. The leadership factors are based on the transformational, transactional, and non-transactional leadership theories.

Transformational leadership. Bass (1985) identifies five factors for transformational leadership: (a) idealized influence (attribute), (b) idealized influence (behavior), (c) inspirational motivation, (d) intellectual stimulation, and (e) individualized consideration.

Idealized attribute. Idealized attribute “refers to the socialized charisma of the leader, whether the leader is perceived as being confident and powerful, and whether the leader is viewed as focusing on higher-order ideals and ethics” (Antonakis, Avolio, & Sivasubramaniam, 2003, p. 264). Effective leaders instill pride in their followers, go beyond self-interest for the good of the group, and act in ways that build others’ respect in them.

Idealized behavior. Idealized behavior refers to the leader’s actions that focus on “values, beliefs, and a sense of mission” (Antonakis et al., 2003, p. 264). Effective leaders consider the moral and ethical consequences of their decisions. They admit their own mistakes, and enthusiastically demonstrate commitment to their goals and the organization’s goals.

Inspirational motivation. Inspirational motivation refers to the way that leaders motivate their followers by being optimistic, ambitious, “projecting an idealized vision, and communicating to followers that the vision is achievable” (Antonakis et al., 2003, p. 265). Effective leaders clearly communicate goals and objectives to their followers. They support their followers as needed, and recognize their achievements.

Intellectual stimulation. Intellectual stimulation refers to how the leader promotes inquiry and critical thinking. Effective leaders re-examine critical assumptions and question whether these assumptions are appropriate. They seek differing perspectives when solving

problems. They look at problems from different angles and suggest new ways on how to complete tasks.

Individualized consideration. Individualized consideration refers to how the leader advises, supports, and pays “attention to the individual needs of followers, and thus allowing them to develop and self-actualize” (Antonakis et al., 2003, p. 265). Effective leaders spend time teaching and coaching. Because they work with individuals on a one-to-one basis, they learn about their strengths and weaknesses, and become resourceful mentors for these individuals.

Transactional leadership. Transactional leadership is an exchange process between the leader and the employees. The leader sets the objectives, and monitors and controls the outcomes. Transactional leadership consists of three factors: (a) contingent reward leadership, (b) management by exception (MBE) active, and (c) management by exception passive (Antonakis et al., 2003).

Contingent reward leadership. Contingent reward leadership is the most active form of transactional leadership. The leaders focus on defining the roles and responsibilities, and provide followers with rewards that are contingent on task completion. They set clear expectations, exchange services, negotiate resources, and arrange mutual agreements.

MBE active. MBE active occurs when the leaders take corrective actions to prevent mistakes. They interact with the followers if there is a difference between the planned results and the actual results.

MBE passive. MBE passive occurs when the leaders take corrective actions only after mistakes happen, or when performance does not meet expectations.

Non-transactional leadership. The non-transactional laissez-faire leadership is the least effective leadership. The leaders do not use authority, avoid responsibility, and choose not to do anything. They ignore people when they ask for help and do not have a say in important issues.

Validity and reliability of the MLQ. Antonakis et al. (2003) examined the validity of the MLQ using “largely homogeneous business samples consisting of 2,279 pooled male and 1,089 pooled female raters who evaluated same-gender leaders” (p. 261). It was essential that samples were homogeneous to test the construct validity of the MLQ. The MLQ (Form 5X) was found to be a valid and reliable instrument to adequately measure the nine leadership factors of the full-range theory of leadership (Antonakis et al., 2003). The reliabilities of the 45 items and the nine leadership factor scales ranged from .74 to .94 indicating consistency and stability of participants’ scores over time (Bass & Avolio, 2004).

Avolio and Bass (2004) further described distributions of scores of the nine leadership factor scales in a study based on the MLQ self-ratings of the 2004 normative sample ($N = 3,375$). The participants scored the lowest on idealized attribute ($M = 2.95$, $SD = .53$) and the highest on individualized consideration ($M = 3.16$, $SD = .52$) in the area of transformational leadership (Bass & Avolio, 2004). They scored the lowest on MPE-passive ($M = 1.07$, $SD = .62$) and the highest on contingent rewards ($M = 2.99$, $SD = .53$) in the area of transactional leadership (Bass & Avolio, 2004). As for laissez-faire, the participants’ scores were the lowest ($M = .61$, $SD = .52$) among all leadership factor scales. There were significant positive correlations among the transformational leadership scales (Bass & Avolio, 2004). The highest correlation ($r = .58$, $p < .05$) was between individualized behavior and inspirational motivation, and the lowest ($r = .39$, $p < .01$) was between

individualized attribute and intellectual stimulation (Bass & Avolio, 2004). There were significant ($p < .01$) positive and strong correlations between contingent reward and each of the transformational leadership scales. The MBE-active leadership scale was significantly correlated with contingent reward ($r = .06, p < .01$), inspirational motivation ($r = -.08, p < .01$), and individualized consideration ($r = -.13, p < .01$; Bass & Avolio, 2004). The MBE-passive leadership and laissez-faire were significantly ($p < .01$) negatively correlated with each of the transformational leadership scales and with contingent reward. However, they were significantly ($p < .01$) positively correlated with each other and with MBE-active (Bass & Avolio, 2004).

***VIEW*: An Assessment of Problem Solving Style**

VIEW builds on the combined experience of Selby, Treffinger and Isaksen (2007) in research, training, and applications on creativity, Creative Problem Solving, and style. It has 34 items to assess the three dimensions of the problem-solving style theory: (a) eighteen items for Orientation to Change: Explorer-Developer; (b) eight items for Manner of Processing: External-Internal; and (c) eight items for Ways of Deciding dimensions: Person-Task. Each item has a score, ranging from 1 to 7. The score for each dimension is the average score for its items.

***VIEW* dimensions.** Each dimension represents a continuum of style preferences. Individuals are located on the continuum depending on how they “prefer to define, solve, and carry out solutions for problems and to deal with change” (Treffinger et al., 2007, p. 5). Individuals’ styles located on either ends of the continuum of any dimension may appear to be opposite styles and are described as *well-defined* or *strongly differentiated*. Styles in the

center of the continuum, within one standard deviation from the mean of the dimension, are called *Moderate* preferences.

Orientation to Change: Explorer – Developer. Orientation to Change (OC) focuses on how individuals prefer to respond to change, how they prefer to manage structure, and how they “prefer to deal with boundaries, parameters, and authority” (Treffinger, Selby, Isaksen, & Crumel, 2007, p. 6). Individuals who prefer to take risks and choose not to conform to authority because it may limit their creativity are *Explorers*. Individuals who prefer to improve the present based on the past and the future based on the present prefer well-structured environments and seek efficient ways to improve tasks and situations are *Developers*. Individuals with *Moderate* preferences for this dimension may feel that their behaviors are situational depending on the context.

Manner of Processing: External – Internal. Manner of Processing (MP) focuses on how individuals “prefer to manage information and flow,” how they prefer to share their thinking, and how they prefer to interact with others based on their “inner energy and resources, the energy and resources of others, and the environment” (Treffinger, Selby, Isaksen, & Crumel, 2007, p. 15). Individuals who interact with others and prefer to get input from them and feedback on their ideas prefer the *External* style. Individuals who prefer to work quietly, prefer to reflect on their own thoughts, and get strength from their inner energy prefer the *Internal* style. Individuals with *Moderate* preferences for this dimension understand and value differences in preferences and approaches of the *Externals* and the *Internals*.

Ways of Deciding: Person – Task. Ways of Deciding (WD) deals with preferences for the *Person* or the *Task*. The *Person* style emphasizes harmony, positive relations and

impact on people when solving problems or dealing with change. The *Task* style separates ideas, problems, and challenges from the person and emphasizes rigor, objectives, standards, and outcomes. Individuals with moderate preferences for this dimension value the human factor of the *Person* style and the objectivity of the *Task* style.

Validity and reliability of *VIEW*. The model of problem solving style and its *VIEW* instrument have been widely used in research. With the most recent database of 31,360 subjects over a 10-year period, Isaksen (2012) reported that the intercorrelations among the three dimensions are significantly weak ($p < .01$) *indicating* that the dimensions are independent. The OC-MP correlation is .10, and each of the OC-WD and MP-WD correlations is .11. Using the results of a factor analysis of *VIEW*, Isaksen (2012) provided evidence that the instrument has a valid structure. Isaksen (2012) also described distributions of scores of the three dimensions and reported on reliability. The responses on the OC dimension range from 18 to 126 with an observed mean of 74.2, a standard deviation of 15.7, and a Cronbach's Alpha reliability of .87. The scores on the MP dimension range from 8 to 56 with an observed mean of 29.2, a standard deviation of 9.1, and a Cronbach's Alpha reliability of .86. As for the WD dimension, its scores range from 8 to 56 with an observed mean 35.3, a standard deviation of 8.5, and a Cronbach's Alpha reliability of .84.

Demographic Survey

The researcher created a 5-item demographic survey for Wave 1 to describe the characteristics of the participants in the sample in relation to their cohort, current position, gender, years of experience in education and current school setting. She also addressed qualitatively common themes among the cohort members on how they perceive instructional leadership, teacher leadership, and instructional leaders' problem solving through three open-

ended questions. Refer to Appendix C for the complete demographic survey and the open-ended questions addressed to Wave 1 participants.

For Wave 2, the researcher redesigned Wave 1 survey by removing the cohort information and adding ethnicity, years of teaching, subject teaching, highest degree earned, certificate of endorsement, and self-ratings on a scale of 1-5 as an instructional leader, an administrative leader, a teacher leader, and a problem solver. However, the question related to the self-ratings was not used in the analyses in this study. The researcher addressed qualitatively common themes among K-12 educators on how they perceive instructional leadership, teacher leadership, and instructional leaders' problem solving through three free-response questions. See Appendix F for the complete demographic survey and the free-response questions addressed to Wave 2 participants.

Research Questions and Hypotheses

Through two waves of data collection from four districts and six cohorts of past and current doctoral students, two quantitative questions and one qualitative question related to educators' leadership and problem solving styles guided this study.

Research Question One

Is there a significant difference in scores on the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*) between educators based on their preferences for problem solving styles produced by the three *VIEW* dimensions (*OC*: E-e-d-D; *MP*: E-e-i-I; and *WD*: P-p-t-T)?

- a. Is there a significant difference in scores on the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*) between educators on the Orientation to Change dimension who prefer the well-defined Explorer (E),

moderate Explorer (e), moderate Developer (d), or well-defined Developer (D) Problem-Solving Style?

- b. Is there a significant difference in scores on the MLQ leadership styles (*transformational, transactional, and passive/avoidant*) between educators on the Manner of Processing dimension who prefer the well-defined External (E), moderate External (e), moderate Internal (i), or well-defined Internal (I) Problem-Solving Style?
- c. Is there a significant difference in scores on the MLQ leadership styles (*transformational, transactional, and passive/avoidant*) between educators on the Ways of Deciding dimension who prefer the well-defined Person (P), moderate Person (p), moderate Task (t), or well-defined Task (T) Problem-Solving Style?
- d. Are there significant interactions among the three *VIEW* dimensions (*OC, MP, WD*) for the three leadership styles (*transformational, transactional, passive/avoidant*)?

Non-directional hypotheses. There will be a significant difference in scores on the MLQ leadership styles (*transformational, transactional, and passive/avoidant*) between educators based on their preferences for problem solving styles produced by the three *VIEW* dimensions (*OC: E-e-d-D; MP: E-e-i-I; and WD: P-p-t-T*).

- a. There will be a significant difference in scores on the MLQ leadership styles (*transformational, transactional, and passive/avoidant*) between educators on the Orientation to Change dimension who prefer the well-defined Explorer (E), moderate Explorer (e), moderate Developer (d), or well-defined Developer (D) Problem-Solving Style.

- b. There will be a significant difference in scores on the MLQ leadership styles (*transformational, transactional, and passive/avoidant*) between educators on the Manner of Processing dimension who prefer the well-defined External (E), moderate External (e), moderate Internal (i), or well-defined Internal (I) Problem-Solving Style.
- c. There will be a significant difference in scores on the MLQ leadership styles (*transformational, transactional, and passive/avoidant*) between educators on the Ways of Deciding dimension who prefer the well-defined Person (P), moderate Person (p), moderate Task (t), or well-defined Task (T) Problem-Solving Style.
- d. There will be significant interactions among the three *VIEW* dimensions (*OC, MP, WD*) for the three leadership styles (*transformational, transactional, passive/avoidant*).

Research Question Two

To what degree and in what manner are the types of leadership produced by the MLQ (*transformational, transactional, and passive/avoidant*) each predicted by the dimensions of problem solving style (*OC, MP, and WD*), gender, years of teaching experience, highest degree earned, and type of certificate?

Non-directional hypothesis. The dimensions of problem solving (*OC, MP, and WD*), gender, years of teaching experience, highest degree earned, and type of certificate will significantly predict the types of educators' leadership produced by the MLQ (*transformational, transactional, and passive/avoidant*).

Research Question Three

What are the perceptions of educators regarding their leadership and problem solving in K-12 settings?

Research Design and Analysis

Research Design

A convergent parallel mixed methods design was used to address the questions of the study (Creswell & Clark, 2011). Categorical data obtained from the demographic survey were reported by gender, current role, ethnicity, years of experience, highest degree earned, and type of certificate. Quantitative data obtained from the instruments were analyzed using descriptive statistics. A quantitative causal comparative research design was applied to address Question One and a correlational design was used to address Question Two. A generic qualitative design (Caelli, Ray, & Mill, 2003) based on the perceptions of K-12 educators about instructional leadership, teacher leadership, and problem solving was used to address Question Three. In this study, the researcher seeks to understand the characteristics of K-12 participants involved in the different settings (Gall, Gall, & Borg, 2007). The purpose is to address generalizability of the results and not to compare the findings among the school systems (Bogdan & Biklen, 2007). The patterns and themes observed in the participants' responses to the open-ended questions were then coded using open coding, axial coding, and selective coding (Bogdan & Biklen, 2007). The qualitative findings were then triangulated with the quantitative results.

Variables

Question One. There were three independent variables for Research Question One. They were the three *VIEW* dimensions: Orientation to Change, Manner of Processing, and

Ways of Deciding. Each independent variable has four levels based on whether the dimension's score represented a well-defined style preference (demonstrated by the use of a capital letter, for example, E for Explorer and D for Developer), or a moderate preference (represented by a lower case letter, such as e for Moderate Explorer and d for Moderate Developer). Therefore, the four levels of the independent variables, OC, MP, and WD, are E-e-d-D, E-e-i-I, and P-p-t-T respectively. A moderate preference has a score within one standard deviation from the mean. The means and standard deviations used for *VIEW*'s three dimensions were those from the master database (Treffinger, 2013): (a) OC ($M = 74.4$, $SD = 15.7$), (b) MP ($M = 29.4$, $SD = 9.2$), and (c) WD ($M = 35.4$, $SD = 8.4$). The independent variables and their levels were coded as categorical variables (Meyers et al., 2006) to represent individual preferences for a problem solving style ranging from 1-4. For the OC dimension, a code of 1 was used to represent a well-defined Explorer (E), 2 = Moderate Explorer, 3 = Moderate Developer, and 4 = well-defined Developer. Similar codes were used for the MP and WD dimensions and their levels. The dependent variables were the mean scores of the three MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*).

Question Two. The predictor variables for Research Question Two were: (a) the mean scores of the dimensions of *VIEW* (OC, MP, and WD), (b) gender (1 = *male*, 2 = *female*), (c) years of teaching experience (1 = 1-5 years, 2 = 6-10 years, 3 = 11-15 years, 4 = 16-20 years, 5 = 21+ years), (d) highest degree earned (1 = BA/BS, 2 = MA/MS/professional diploma, 3 = 6th year/education specialist, 4 = PhD/EdD), and (e) type of certificate held (1 = *non-administrative certificate*, 2 = *administrative certificate*). Exact values of the dimensions of problem-solving style were used. Three multiple regression procedures were

conducted. The criterion variables for Question Two were the mean scores of each of the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*; Bass & Avolio, 2004).

Question Three. The participants' responses for each of the three open-ended questions related to Question Three were coded so that emerging patterns and themes were identified.

Data Analysis

Using Statistical Package for the Social Sciences (SPSS; Green & Salkind, 2008), the researcher conducted data analyses using the following quantitative techniques:

1. Research Question One was analyzed using one 4x4x4 MANOVA to examine differences between educators' perceptions of leadership (*transformational*, *transactional*, and *passive/avoidant*) with respect to the dimensions of VIEW (*OC*: E-e-d-D; *MP*: E-e-i-I; and *WD*: P-p-t-T). A 4x4x4 MANOVA is a 4x4x4 between-subjects factorial design with three independent variables (*OC*, *MP*, *WD*), each with four levels (E-e-d-D, E-e-i-I, P-p-t-T; Meyers et al., 2006).
2. Research Question Two was analyzed using three multiple regression procedures. The dimensions of problem solving style (*OC*, *MP*, and *WD*), gender, years of teaching experience, highest degree earned, and type of certificate were used to predict each of the three types of leadership styles (*transformational*, *transactional*, and *passive/avoidant*).
3. Research Question Three was analyzed by coding the participants' responses using open coding, axial coding, and selective coding.

Significance level. The .05 level is a commonly used significance level in the social sciences. Because the data were manipulated four times, one time using MANOVA and three times running the multiple linear regressions, the Bonferroni adjustment technique was applied to minimize the potential of any false significance. Therefore, given that four statistical tests were conducted, the adjusted alpha level of .0125 (.05/4) was used to correct for Type I errors (Huck, 2008; Tabachnick & Fidell, 2013). This means that if one takes multiple samples from the same population, one can expect statistically similar results 98.75% of the time.

Missing demographic data. Wave 1 demographic survey did not include ethnicity, years of teaching experience, subject taught, and type of certificate, resulting in 75 records missing these types of demographic information.

Missing quantitative data. Missing data was a major concern. Initially, the researcher visually inspected the data in an EXCEL file. She looked for patterns of missing data, amount of missing data, and attempted to reason why specific data were missing because nonrandom missing values may seriously impact the generalizability of the findings (Tabachnick & Fidell, 2013). The following data patterns were found:

1. One participant missed all MLQ items and completed *VIEW*.
2. One participant missed all *VIEW* items and one MLQ item.
3. Six other participants did not respond to some questions on both the MLQ and *VIEW*.
4. Nineteen records, 4 from Wave 1 and 15 from Wave 2, had at most 3 blank *VIEW* responses.

5. There were 71 cases, 24 from Wave 1 and 47 from Wave 2, with, at most, 16 missing MLQ items.

It was evident from the visual inspection that the pattern of missing data was random. The researcher later described how she cleaned the codes and the values in Chapter Four.

Missing qualitative data. Missing qualitative data did not impact the quantitative data analysis or the qualitative data analysis. There were three blank responses to the first qualitative question about the characteristics of an instructional leader, seven blank responses to the second qualitative question about the characteristics of a teacher leader, and six blank responses to the third qualitative question about the characteristics of a problem solver.

Limitations to the Study

Quantitative Threats

The quantitative threats that impact the study are both internal and external (Gall, Gall, & Borg, 2007) and encompass threats for survey research (Fraenkel & Wallen, 2006).

Internal threats to validity. The quantitative internal threats include mortality, instrumentation, and subject characteristics.

Mortality threat. A mortality threat occurs when something unexpected happens during the study and results in incomplete surveys (Fraenkel & Wallen, 2006). An example would be that some participants were interrupted while they were completing the questionnaires and, therefore, left some information blank. This was recorded as missing information. A mortality threat may have a medium to large effect on the study, depending on the number and types of missing items, the randomness of missing items, the patterns if there are any, and the impact of these items on the results of the study (Tabachnick & Fidell, 2013). Since 16 cases were deleted due to missing data, a total of 4.35% of the total number

of respondents after unusable surveys were removed from the sample, history was seen as a small threat to this study.

Instrumentation threat. One issue related to instrumentation happens if the scoring procedure or the nature of the instrument is changed, which yields different results, and hence different interpretations (Fraenkel & Wallen, 2006). Instrumentation represented a medium threat in this study because there were two waves of data collection. To reduce this threat, the researcher used the demographic information that was common to both the original and the revised demographic survey.

Another issue related to instrumentation is data collector characteristic (Fraenkel & Wallen, 2006). It exists in survey research when data are collected at one point in time, when participants feel that the researcher is evaluating their knowledge or abilities, and they respond to meet the researcher's expectations (Fraenkel & Wallen, 2006). The researcher does not hold a supervisory position in any of the school settings. Therefore, she was not a threat to any participant. Data collector characteristic was viewed as a small threat to this research.

Subject threat. Subject characteristics threat is a major threat to internal validity in both causal comparative and correlational studies (Fraenkel & Wallen, 2006).

Causal comparative study. In a causal comparative research subject characteristics threat may occur because variables such as gender, ethnicity, years of experience, and, type of certificate cannot be manipulated (Fraenkel & Wallen, 2006). The results would be biased if the subjects who did not participate have different responses from those who participated. To reduce the effect of this threat and to encourage participation in the study, the researcher

arranged with school administrators to have a specific time slot set aside for responding to the surveys.

Correlational study. In a correlational study, subject characteristics threat or selection bias may occur when people are selected for a study based on some variables, but some subject characteristics other than those identified as the independent variables can influence the dependent variable (Fraenkel & Wallen, 2006). In this study, the researcher selected variables such as individual problem solving style, gender, years of experience, level of education, and type of certificate that cannot be manipulated. To reduce the effect of subject selection bias, the researcher reported the characteristics of the subjects in detail, and verified that the assumption of multicollinearity among the selected predictor variables was met prior to analyzing the data for the statistical regression on each of the dependent variables (Meyers et al., 2006).

External threats to validity. The quantitative external threats consist of population validity and ecological validity.

Population validity. Population validity or generalizability “refers to the degree to which a sample represents” (Fraenkel & Wallen, 2006, p. 109) the accessible population. Since this sampling process was based on volunteering and not on a stratified sampling procedure, the results cannot be generalized to the population. To accommodate for this limitation, the researcher selected a sufficiently large sample of K-12 educators from districts in rural, urban, and suburban areas and educators in a doctoral program that would be comparable to the target population in the school districts selected for the study.

Ecological validity. Ecological validity “refers to the degree to which results of a study can be extended to other settings or conditions” (Fraenkel & Wallen, 2006, p. 111). To

minimize the impact of this threat, the researcher described the participants in enough detail to allow future researchers to apply the results to similar settings.

Location threat. Another threat specific to causal-comparative designs includes the location of the survey administration (Fraenkel & Wallen, 2006). It occurs when administering the tests in different locations may impact the participants' responses. The researcher held a total of 11 meetings in the four districts. Five meetings were held during faculty meetings in the media center or in the cafeteria where the school usually holds its monthly meeting. The six other meetings were voluntary meetings and were held at the end of the school day in the media center or in the cafeteria. In this study, the participants completed the questionnaires on site at the time the researcher administered the instruments. The researcher administered the assessments to participants during the voluntary meetings. When the researcher expected a high participation rate at a meeting, two additional research assistants assisted in the distribution and collection of the survey packets. To ensure that the different locations and test administrators did not bias or influence the results, the researcher and the test administrators kept their distance from the participants and did not provide any information that might bias the participants' responses. To ensure data anonymity to the researcher, a research assistant separated the signed informed consents from the completed questionnaires. Participants were requested to not write their names on the instruments. The researcher only accessed the data using the codes for data analysis. Code numbers assigned to *VIEW* were used instead of participants' names, as the researcher analyzed data by gender, years of experience in education, and current educational role. The completed surveys used in the data analyses were then assigned sequential codes from 1 through 368. Data were

confidential, and were only used by the researcher for the purpose of this study. No names of participants were used throughout the reports.

Qualitative Threats: Trustworthiness

The researcher sought four aspects of qualitative *trustworthiness*: (a) *truth-value* or *credibility*, (b) *applicability* or *transferability*, (c) *consistency* or *dependability*, and (d) *neutrality* or *confirmability* (Krefting, 1991).

Truth value. Truth value or credibility refers to how well and how accurately a researcher can present multiple realities that informants may perceive. The researcher used triangulation to establish credibility of the study. She described the themes and patterns she found in the participants' responses to open-ended questions, and interpreted the findings to be able to compare these patterns and themes to the results of the quantitative research.

Applicability. Applicability or transferability refers to the ability to generalize the findings from the sample to another population. In a qualitative study, the ability to generalize may not be possible because the study may not be relevant to other settings. The researcher described the characteristics of the sample in detail, allowing future researchers to apply the results and methodology to other school settings.

Consistency. Consistency or dependability refers to reliable data and findings if the qualitative study was replicated with the same participants or in a similar context. In a qualitative study, it is critical that the researcher learns about the different experiences of the informants. It is important that the researcher recognizes different sources of variability since "variability is expected in qualitative research" (Krefting, 1991, p. 175).

Neutrality. Neutrality or confirmability means that the research procedures and results are not biased. It "is achieved through rigor of methodology through which reliability

and validity are established” (Krefting, 1991, p. 175). The findings are based on the informants’ experiences. In this study, the researcher achieved confirmability by auditing the data and using triangulation to verify the researcher’s interpretation of the data.

Statement of Ethics and Confidentiality

The researcher requested permission from WCSU’s IRB to conduct this study. The information that the participants provided were anonymous to the researcher. Participants remained unknown because their names were not linked in any computer database or to the completed questionnaires. Each participant was assigned a coded identification number. The data were locked in a filing cabinet. Qualitative data were coded objectively and professionally, and were analyzed based on the existing literature (Strauss & Corbin, 1998).

CHAPTER FOUR: ANALYSIS OF DATA AND EXPLANATION OF FINDINGS

The purpose of this study was three-fold: (a) to examine K-12 educators' leadership styles based on their problem solving styles; (b) to understand how their leadership styles are predicted by preferences for problem solving, gender, years of teaching experience, highest degree earned, and type of certificate; and (c) to examine educators' perceptions of their leadership and problem solving in their educational settings. Three research questions related to educators' leadership and problem solving styles were addressed:

1. Is there a significant difference in scores on the MLQ leadership styles (*transformational, transactional, and passive/avoidant*) between educators based on their preferences for problem solving styles produced by the three *VIEW* dimensions (*OC: E-e-d-D; MP: E-e-i-I; and WD: P-p-t-T*)?
 - a. Is there a significant difference in scores on the MLQ leadership styles (*transformational, transactional, and passive/avoidant*) between educators on the *Orientation to Change* dimension who prefer the well-defined Explorer (E), moderate Explorer (e), moderate Developer (d), or well-defined Developer (D) Problem-Solving Style?
 - b. Is there a significant difference in scores on the MLQ leadership styles (*transformational, transactional, and passive/avoidant*) between educators on the *Manner of Processing* dimension who prefer the well-defined External (E), moderate External (e), moderate Internal (i), or well-defined Internal (I) Problem-Solving Style?
 - c. Is there a significant difference in scores on the MLQ leadership styles (*transformational, transactional, and passive/avoidant*) between educators

on the *Ways of Deciding* dimension who prefer the well-defined Person (P), moderate Person (p), moderate Task (t), or well-defined Task (T) Problem-Solving Style?

- d. Are there significant interactions among the three *VIEW* dimensions (*OC*, *MP*, *WD*) for the three leadership styles (*transformational*, *transactional*, and *passive/avoidant*)?
2. To what degree and in what manner are the types of leadership produced by the MLQ (*transformational*, *transactional*, and *passive/avoidant*) each predicted by the dimensions of problem solving style (*OC*, *MP*, and *WD*), gender, years of teaching experience, highest degree earned, and type of certificate?
3. What are the perceptions of educators regarding their leadership and problem solving in K-12 settings?

The researcher tested the following quantitative non-directional hypotheses for Research Questions One and Two:

1. There will be a significant difference in scores on the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*) between educators based on their preferences for problem solving styles produced by the three *VIEW* dimensions (*OC*: E-e-d-D; *MP*: E-e-i-I; and *WD*: P-p-t-T).
 - a. There will be a significant difference in scores on the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*) between educators on the *Orientation to Change* dimension who prefer the well-defined Explorer (E), moderate Explorer (e), moderate Developer (d), or well-defined Developer (D) Problem-Solving Style.

- b. There will be a significant difference in scores on the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*) between educators on the *Manner of Processing* dimension who prefer the well-defined External (E), moderate External (e), moderate Internal (i), or well-defined Internal (I) Problem-Solving Style.
 - c. There will be a significant difference in scores on the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*) between educators on the *Ways of Deciding* dimension who prefer the well-defined Person (P), moderate Person (p), moderate Task (t), or well-defined Task (T) Problem-Solving Style.
 - d. There will be significant interactions among the three *VIEW* dimensions (*OC*, *MP*, *WD*) for the three leadership styles (*transformational*, *transactional*, and *passive/avoidant*).
2. The dimensions of problem solving (*OC*, *MP*, and *WD*), gender, years of teaching experience, highest degree earned, and type of certificate will predict the types of educators' leadership produced by the MLQ (*transformational*, *transactional*, and *passive/avoidant*).

This chapter presents the following sections: (a) description of the data, (b) data screening process, (c) quantitative data analysis and results for Research Question One, (d) quantitative data analysis and results for Research Question Two, (e) qualitative data analysis and results for Research Question Three, (f) triangulation of findings, and (g) chapter summary.

Description of Data

Quantitative data were collected from the Multi-Factor Leadership Questionnaire (MLQ) and *VIEW*: An Assessment of Problem Solving Style. The MLQ produced the following three mean subscale scores: (a) transformational leadership, (b) transactional leadership, and (c) passive/avoidant. *VIEW* yielded the following three mean dimension scores: (a) Orientation to Change: Explorer-Developer, (b) Manner of Processing: External-Internal, and (c) Ways of Deciding: Person-Task. The data from both instruments were collected for Research Question One and Research Question Two. All participants were asked to respond to demographic survey questions related to gender, ethnicity, current role, years of experience, grade level teaching, highest degree earned, and type of certificate, which provided information to best describe the characteristics of the sample and the participants. Gender, years of experience, highest degree earned, and type of certificate also were collected for Research Question Two. In addition, the participants were asked to provide responses to three qualitative open-ended questions about how they perceive the characteristics of an instructional leader, a teacher leader, and a problem solver. These free responses were collected for Research Question Three.

For Research Question One there were three independent variables. They were the three *VIEW* dimensions: (a) Orientation to Change, (b) Manner of Processing, and (c) Ways of Deciding. Each independent variable has four levels. The four levels of Orientation to Change (E, e, d, D) are: (a) well-defined Explorer, (b) Moderate Explorer, (c) Moderate Developer, and (d) well-defined Developer. The four levels of Manner of Processing (E-e-i-I) are: (a) well-defined External, (b) Moderate External, (c) Moderate Internal, and (d) well-defined Internal. The four levels of Ways of Deciding (P-p-t-T) are: (a) well-defined Person,

(b) Moderate Person, (c) Moderate Task, and (d) well-defined Task. Specifically, a moderate preference has a score within one standard deviation from the mean. The means and standard deviations used for *VIEW*'s three dimensions were those from the master database (Treffinger, 2013): (a) OC ($M = 74.4$, $SD = 15.7$), (b) MP ($M = 29.4$, $SD = 9.2$), and (c) WD ($M = 35.4$, $SD = 8.4$). The dependent variables were the mean scores of the three MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*). The dependent variables for Research Question One were the mean scores of the three MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*).

For Research Question Two the predictor variables were: (a) the mean scores of the dimensions of *VIEW* (OC, MP, and WD), (b) gender (male, female), (c) years of teaching experience (intervals of 5 years), (d) highest degree earned (BA/BS, MA/MS/professional diploma, 6th year/education specialist, PhD/EdD), and (e) type of certificate held (non-administrative certificate, administrative certificate). The criterion variables for Research Question Two were the mean scores of each of the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*).

For Research Question Three the participants' responses for each open-ended question were coded and the emerging themes were identified using open coding, axial coding, and selective coding.

Data Screening Process

Prior to data analysis, data screening was completed to examine the quality of the data collected. The data screening process involves data coding and entry, data and value cleaning, visual inspection using SPSS, and detection of outliers (Meyers et al., 2006).

Data Coding and Entry

Each participant received a coded packet to ensure participant confidentiality. Each and every page of the packet was coded to create a unique record for that participant, and to prevent mistakes during data entry should the papers be separated for any unforeseen reason.

Quantitative data. A spreadsheet was created for demographic and quantitative data: (a) the participant's code; (b) the items in the demographic survey (district, school, gender, ethnicity, years of experience, years of teaching, subject area, school setting, highest degree earned, and type of certificate); (c) *VIEW* items (V1 through V34); (d) the mean score for each of *VIEW*'s three dimensions with its four levels; (e) the MLQ questions starting with M1 and ending with M45; (f) the nine leadership components (individualized attribute, individualized behavior, inspirational motivation, intellectual stimulation, individualized consideration, contingent reward, MBE-active, MBE-passive, and laissez-faire); (g) the three outcomes of leadership (extra effort, effectiveness, and satisfaction); (h) the three leadership styles (*transformational*, *transactional*, and *passive/avoidant*); and (i) an average score for outcomes of leadership. The outcomes of leadership were not used for data analysis, but they were a result of the data collection and part of the MLQ calculations.

Consistent with *VIEW* and MLQ calculations of the mean scores of *VIEW*'s dimensions and MLQ's subscales, the researcher embedded formulas in the spreadsheet so that calculations of the mean scores were updated upon data entry. Conditional statements were created to identify the four levels of each of *VIEW*'s three dimensions. The levels of the independent variables were coded as categorical variables (Meyers et al., 2006) to represent individual preferences for a problem solving style ranging from 1 - 4. For the OC dimension, a code of 1 was used to represent a well-defined Explorer (E), 2 = Moderate

Explorer, 3 = Moderate Developer, and 4 = well-defined Developer. Similar codes were used for the MP and WD dimensions and their levels.

The spreadsheet was then transferred to SPSS for data analysis. All variables were imported into SPSS and were stored in a codebook. Refer to Tables 9 through 12 for a description of the variables' names, their codes, the type of SPSS field, and their values.

The demographic information was used to describe the characteristics of the sample and the participants. The levels of the three dimensions of *VIEW* and the mean scores of the MLQ leadership styles were used for the statistical analysis of Research Question One. The mean scores of *VIEW*'s three dimensions (*OC*, *MP*, *WD*), gender, years of teaching experience, highest degree earned, and type of certificate were used for the statistical analysis of Research Question Two.

Table 9

SPSS Codebook of Demographic Variables

Label	Code Name	SPSS Field	Assigned Values
Assigned Code	AssignedCode	Numeric	1 – 368
District or School System	Districtor SchoolSystem	Numeric	1 = District A 2 = District B 3 = District C 4 = District D 5 = EdD program

(continued)

Table 9

SPSS Codebook of Demographic Variables

Label	Code Name	SPSS Field	Assigned Values
School or Cohort	SchoolorCohort	Numeric	1 = District A, Primary School 2 = District A, Middle School 3 = District A, High School 4 = District B, Primary School 5 = District B, Middle School 6 = District B, High School 7 = District C, Primary, PK – 3 8 = District C, Primary, K – 3 9 = District C, Middle School 10 = District C, High School 11 = District D, Middle school 12 = District D, High School 13 = EdD program, Cohort 1 14 = EdD program, Cohort 2 15 = EdD program, Cohort 3 16 = EdD program, Cohort 4 17 = EdD program, Cohort 5 18 = EdD program, Cohort 6

(continued)

Table 9

SPSS Codebook of Demographic Variables

Label	Code Name	SPSS Field	Assigned Values
Gender	Gender1	Numeric	1 = male
	Gender2		2 = female
Ethnicity	Ethnicity	Numeric	1 = Hispanic-American
			2 = African-American
			3 = Native-American
			4 = Caucasian-American
			5 = Asian-American/Pacific Islander
			6 = Other
Yrs of Experience in Education	YrsofExperience inEducationCod esIntervalsof5	Interval	1 = 1-5 years
			2 = 6-10 years
			3 = 11-15 years
			4 = 16-20 years
			5 = 21+ years
Yrs of Teaching Experience	YrsofTeaching Experience	Numeric	Exact 1-44

(continued)

Table 9

SPSS Codebook of Demographic Variables

Label	Code Name	SPSS Field	Assigned Values
Current Role	CurrentRole	Numeric	1 = Teacher 2 = Administrator 3 = Teacher/administrator 4 = Curriculum specialist 5 = Support staff and other
Subject Area	SubjectArea	Numeric	1 = English/ELA 2 = Social Studies 3 = Science 4 = Mathematics 5 = Art and Music 6 = World Languages 7 = SPED 8 = All subjects (K, primary, elementary, grade level for subject) 9 = Business/media 10 = Physical Education 11 = Other

(continued)

Table 9

SPSS Codebook of Demographic Variables

Label	Code Name	SPSS Field	Assigned Values
School Setting or Grade Level	SchoolSetting orGradeLevel	Numeric	1 = PreK – 5 2 = Grade 6 – 8 3 = Grade 9 -12 4 = Across grades
Highest Degree Earned	HighestDegree Earned	Numeric	1 = BA/BS 2 = MA/MS/Professional diploma 3 = 6 th year/Education specialist 4 = PhD/EdD
Certification Status	CertificationStat us1 fornon092an d2for092	Numeric	1 = Non-administrative certificate 2 = administrative certificate

Table 10

SPSS Codebook of MLQ Leadership Scales and Subscales

Label	Code Name	SPSS Field	Possible Values
Transformational Leadership	Transformational Leadership- IA, IB, IM, IS, IC	Numeric	0 – 4
IAIdealizedInfluenceAttributed	IA- Idealized Influence (Attributed)	Numeric	0 – 4
IBIdealizedInfluenceBehavior	IB- Idealized Influence (Behavior)	Numeric	0 – 4
IMInspirationMotivation	IM- Inspirational Motivation	Numeric	0 – 4
ISIntellectualStimulation	IS- Intellectual Stimulation	Numeric	0 – 4
ICIndividualizedConsideration	IC- Individualized Consideration	Numeric	0 – 4

(continued)

Table 10

SPSS Codebook of MLQ Leadership Scales and Subscales

Label	Code Name	Type of SPSS Field	Possible Values
TransactionalLeadership	Transactional	Numeric	0 – 4
CRContingentReward	CR- Contingent Reward	Numeric	0 – 4
MBEAManagementbyExceptionActive	MBE-A- Management-by-Exception (Active)	Numeric	0 – 4
PassiveAvoidantLeadership	Passive/ Avoidant	Numeric	0 – 4
MBEPManagementbyExceptionPassive	MBE-P- Management-by-Exception (Passive)	Numeric	0 – 4
LFLaissezfaireLeadership	LF- Laissez-faire Leadership	Numeric	0 – 4

Table 11

SPSS Codebook of VIEW Dimensions and Levels

Label	Code Name	Type of SPSS Field	Possible Values
OCOrientationtoChange	OC - Orientation to Change	Numeric	18 – 126
OCE	OC-E (Well-defined)	Numeric	18 – 59
OCe_A	OC-e (Moderate)	Numeric	60 – 74
OCd	OC-d (Moderate)	Numeric	75 – 90
OCD_A	OC-D (Well-defined)	Numeric	91 – 126
MPMannerofProcessing	MP - Manner of Processing	Numeric	8 – 56
MPE	MP-E (Well-defined)	Numeric	8 – 20
MPe_A	MP-e (Moderate)	Numeric	21 – 29
MPI	MP-I (Moderate)	Numeric	30 – 38
MPI_A	MP-I (Well-defined)	Numeric	39 – 56
WDWaysofDeciding	WD - Ways of Deciding	Numeric	8 – 56
WDP	WD-P (Well-defined)	Numeric	8 – 27
WDp_A	WD-p (Moderate)	Numeric	28 – 35
WDt	WD-t (Moderate)	Numeric	36 – 44
WDT_A	WD-T (Well-defined)	Numeric	45 – 56

Table 12

SPSS Codebook for Levels of VIEW Dimensions

Label	Code Name	Type of SPSS Field	Assigned Values
OCSplit	OC Split	Numeric	1 – 4
OCE	OC-E	Numeric	0 or 1
OCe_A	OC-e	Numeric	0 or 2
OCd	OC-d	Numeric	0 or 3
OCD_A	OC-D	Numeric	0 or 4
MPSplit	MP Split	Numeric	1 – 4
MPE	MP-E	Numeric	0 or 1
MPe_A	MP-e	Numeric	0 or 2
MPi	MP-i	Numeric	0 or 3
MPI_A	MP-I	Numeric	0 or 4
WDSplit	WD Split	Numeric	1 – 4
WDP	WD-P	Numeric	0 or 1
WDp_A	WD-p	Numeric	0 or 2
WDt	WD-t	Numeric	0 or 3
WDT_A	WD-T	Numeric	0 or 4

Qualitative data. Another spreadsheet was created with columns that represented: (a) the participant's code, (b) the demographic information, (c) the three open-ended questions, (d) the responses to each question, (e) open coding, and (f) axial coding. The spreadsheet was then transferred to SPSS to determine the frequencies of open and axial

coding for each question. The findings were then used to describe the emerging themes and patterns from the participants' responses. Appendix H provides a detailed list of the open codes used in the study.

Data and Value Cleaning

A total of 378 surveys were submitted in both Waves 1 and 2 data collection. Wave 1, cohorts 1 through 5, demographic survey did not include ethnicity, years of teaching experience, subject taught, and type of certificate. The researcher requested permission and received information on ethnicity and type of certificate from the program coordinator to better describe the characteristics of the participants. This left 75 records from Wave 1 with missing information on years of teaching experience and subject taught. An additional 51 records from Wave 2 did not indicate subject taught. Subject taught was not a variable in the data analyses and was left blank where it was not provided. The years of teaching experience was a predictor variable in the second research question. There were at least 78.95% of the cases in Wave 1 ($n = 95$) with missing information on the participants' years of teaching experience. Using the exact values for the years of teaching experience as a predictor variable would limit the regression analysis to a smaller sample size, because SPSS automatically removes the records with missing information from the regression. The predictor variables in a regression study are usually fully continuous if possible (Meyers et al., 2006). However, Tabachnick and Fidell (2013) explained that numerous categories of discrete variables could be used in multivariate analyses to designate a quantitative attribute. In this study, years of teaching experience was the quantitative attribute and was strongly and positively correlated ($r = .83$) with the years of experience in education. The researcher then

used the years of experience categories for increasing years of teaching experience to minimize loss of data in Research Question Two regression analysis.

Upon data entry and visual inspection of the participants' demographic information and responses for accuracy, 10 surveys were deemed unusable and were removed: (a) one survey was removed because there was a consistent pattern in the responses, and (b) nine surveys were completed by individuals who were not teachers and administrators in K – 12 educational setting. Approximately 1.9% of the remaining records ($n = 368$) had some missing demographic information: (a) one did not indicate gender, (b) two did not provide ethnicity information, (c) two did not specify years of experience in education, (d) one did not identify current role and (e) one did not specify highest degree earned.

The researcher then performed a data cleaning and screening procedure to determine whether the MLQ and *VIEW* data were complete. A decision was made to delete cases whenever the amount of missing data exceeded 10% per subscale (Treffinger, Isaksen, & Houtz, 2013). This cutoff represented two items for transformational leadership and one item for each of transactional leadership and passive/avoidant leadership. The researcher inspected missing data for each subscale and for each scale, record by record. An additional 16 cases were removed because of missing data. The cases were: 26, 48, 106, 125, 128, 173, 178, 186, 238, 241, 278, 291, 294, 341, 347, and 348. When the decision was to include a case with missing data less than 10% per subscale, the researcher used mean substitution (Tabachnick & Fidell, 2013). For each missing MLQ item she estimated the mean value for the other items on the subscale and then used it to replace the value of the missing item on that subscale prior to data analysis. For *VIEW*, missing points were estimated using mean scores for each item as long as no more than 3 items were left blank in each dimension

(Selby, Treffinger, & Isaken, 2002). As a result, 352 records were usable and were included in the data analyses for Questions One and Two, 89 records from Wave 1 and 263 records from Wave 2.

Visual Inspection Using SPSS

Using SPSS before starting the statistical analysis provides an efficient way to screen the data in the case of multivariate analysis (Meyers et al., 2006). After the data from the MLQ and *VIEW* were entered into SPSS, visual inspection of the data took place by examining the output, such as frequency tables, histograms, stem and leaf displays, and box plots for each of the dependent variables (*transformational, transactional, passive/avoidant*). There were no missing data. All values were within the range of assigned values.

The descriptive statistics for the MLQ subscales are summarized in Table 13 for Orientation to Change: Explorer-Developer (E-e-d-D), Table 14 for Manner of Processing: External-Internal (E-e-i-I), and Table 15 for Way of Deciding: Person-Task (P-p-t-T).

Table 13

MLQ Descriptive Statistics and VIEW Orientation to Change: Explorer-Developer (n = 352)

MLQ Subscale	Well-Defined	Moderate	Moderate	Well-Defined
	Explorer	Explorer	Developer	Developer
Transformational				
Mean	3.22	3.22	3.09	2.97
Median	3.35	3.25	3.10	2.95
<i>SD</i>	.48	.40	.43	.36
Range	1.90 – 4.00	2.00 – 4.00	1.70 – 3.85	1.95 – 3.70
Transactional				
Mean	2.32	2.36	2.35	2.41
Median	2.33	2.38	2.38	2.44
<i>SD</i>	.48	.46	.52	.54
Range	1.25 – 3.63	1.25 – 3.50	.75 – 3.88	1.25 – 3.63
Passive Avoidant				
Mean	.91	.80	.90	1.13
Median	.94	.75	.88	1.13
<i>SD</i>	.52	.51	.55	.57
Range	.00 – 2.13	.00 – 2.25	.00 – 2.13	.00 – 2.63

Table 14

MLQ Descriptive Statistics and VIEW Manner of Processing: External-Internal (n = 352)

MLQ Subscale	Well-Defined	Moderate	Moderate	Well-Defined
	External	External	Internal	Internal
Transformational				
Mean	3.19	3.14	3.07	3.02
Median	3.20	3.15	3.15	3.05
<i>SD</i>	.38	.41	.43	.48
Range	2.20 – 3.95	2.00 – 4.00	1.70 – 4.00	1.85 – 3.90
Transactional				
Mean	2.34	2.36	2.38	2.34
Median	2.50	2.25	2.38	2.50
<i>SD</i>	.44	.54	.53	.48
Range	1.25 – 3.50	.88 – 3.88	.75 – 3.38	1.25 – 3.13
Passive Avoidant				
Mean	.97	.79	1.00	.99
Median	1.00	.75	1.00	1.00
<i>SD</i>	.56	.52	.54	.57
Range	.00 – 2.63	.00 – 2.00	.00 – 2.13	.00 – 2.13

Table 15

MLQ Descriptive Statistics and VIEW Ways of Deciding: Person-Task (n = 352)

MLQ Subscale	Well-Defined	Moderate	Moderate	Well-Defined
	Person	Person	Task	Task
Transformational				
Mean	3.12	3.10	3.15	3.06
Median	3.13	3.15	3.20	2.98
<i>SD</i>	.36	.46	.42	.38
Range	2.20 – 3.95	1.70 – 4.00	1.85 – 4.00	1.95 – 3.80
Transactional				
Mean	2.27	2.34	2.43	2.40
Median	2.23	2.38	2.50	2.50
<i>SD</i>	.51	.52	.49	.49
Range	1.13 – 3.38	.75 – 3.88	1.25 – 3.63	1.25 – 3.25
Passive Avoidant				
Mean	.92	.94	.87	.99
Median	.88	.88	.82	1.13
<i>SD</i>	.58	.54	.55	.54
Range	.00 – 2.63	.00 – 2.25	.00 – 2.13	.00 – 2.00

The minimum and maximum values of the mean scores of problem solving styles were consistent with *VIEW*. The sample mean and standard deviation on each of *VIEW* dimensions were compared with *VIEW* master data base ($N = 36,236$) statistics (Treffinger, 2013). The sample means and the master data base means were within 4.5% difference. The standard deviations were within 6% variation (see Table 16).

Table 16

Mean Scores and Standard Deviations of VIEW Dimensions (n = 352)

<i>VIEW</i> Dimensions	Sample		Database	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Orientation to Change	77.5	16.2	74.4	15.7
Manner of Processing	28.5	9.1	29.4	9.2
Ways of Deciding	33.8	7.9	35.4	8.4

Detection of Outliers

Outliers should be addressed before proceeding with the statistical analyses (Meyers et al., 2006). A case with an extreme value for a single variable is identified as a univariate outlier, and a case with an extreme value on a combination of variables is called a multivariate outlier (Tabachnick & Fidell, 2007). Therefore, after visually screening and dealing with missing data, SPSS was used to identify univariate and multivariate outliers.

Univariate outliers. To detect univariate outliers, the researcher visually inspected the histograms, the box plots, and normal probability plots for each of the dependent variables (transformational, transactional, passive/avoidant). For instance, Figure 1 displays the SPSS box and whiskers plot of the transformational leadership data. SPSS identified some scores in the lower portion of the distribution to be extreme, but none of these scores

were considered unusual enough to be deleted. These outliers could be left alone because they represented less than 1% or 2% of the sample size (Cohen, West, & Aiken, 2003). Besides, Tabachnick and Fidell (2013) defined potential outliers as those cases with standardized scores in excess of 3.29 ($p < .001$). Standardized scores were calculated for all transformational, transactional, and passive/avoidant leadership scores. None of the cases in the data sets for leadership was identified as extreme. Similar non-deletion decisions were then made for the so-called outliers in the SPSS box and whiskers plots of the transactional and passive/avoidant leadership data sets.

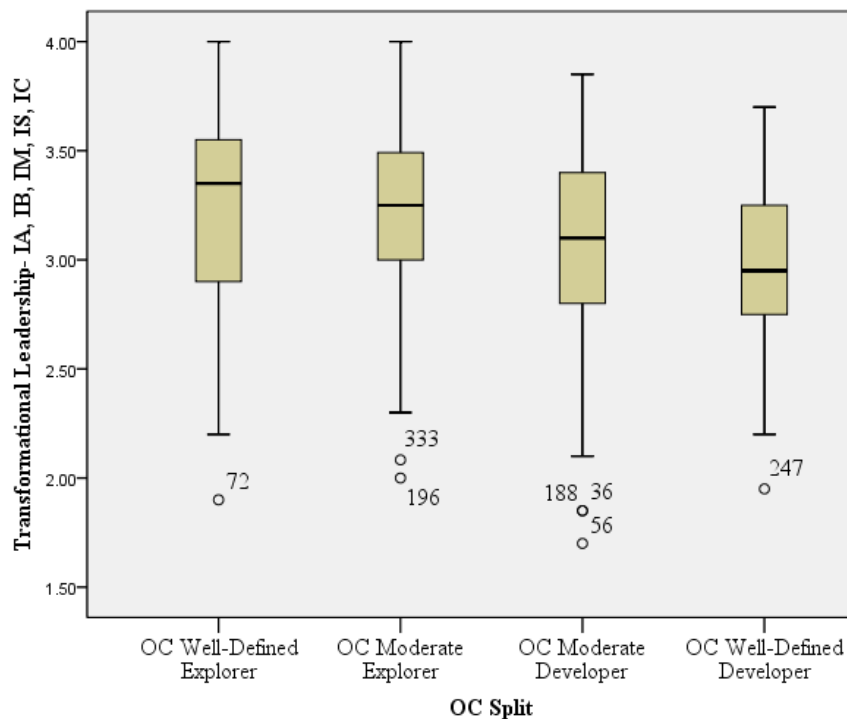


Figure 1. SPSS Box and Whiskers Plot of Transformational Leadership

Multivariate outliers. After inspecting the data set for univariate outliers, the researcher plotted a scatterplot matrix for the dependent variables (transformational, transactional, passive/avoidant). A scatterplot matrix is a bivariate scatterplot showing a relationship for combinations of the dependent variables (Meyers, Gamst, & Guarino, 2006). Each point on the plot represented a case, resulting in a total of 352 cases for each combination. Figure 2 indicated that most cases were located within the oval-shaped swarm. Visually, few cases could be described as multivariate outliers because they appeared to be outside the elliptical pattern mass (Meyers et al., 2006), but they were not considered for possible elimination.

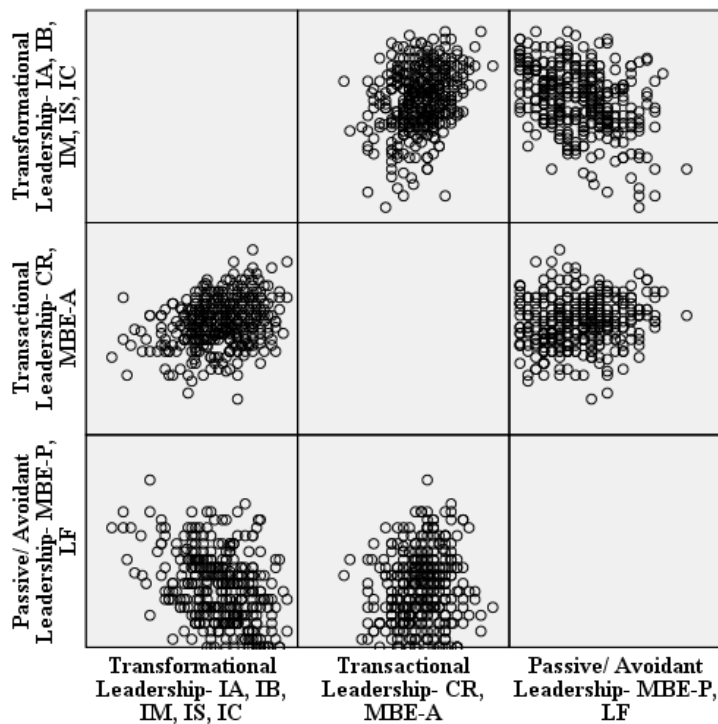


Figure 2. Scatterplot Matrix of MLQ Leadership Styles

The researcher sought a more objective way to identify multivariate outliers (Meyers et al., 2006). She computed each case's Mahalanobis distance (D^2). It is a statistic that measures the multivariate "distance" between each case and the multivariate mean of each group. Each case's distance was then compared to the chi-square criterion, which was evaluated as $\chi^2(3, N = 352) = 16.266$, at a stringent significance level of .001 (Meyers et al., 2006), where 16.266 was the largest D^2 value calculated. Table 17 summarizes the Mahalanobis distances for the extreme cases that SPSS identified. Because none of the values exceeded the χ^2 criterion, the researcher concluded that there were no multivariate outliers.

Table 17

Extreme Values for the Mahalanobis Distance

Mahalanobis Distance		Case Number	Value
Highest	1	313	15.32820
	2	188	13.38045
	3	56	11.95277
	4	53	10.88055
	5	81	10.31862
Lowest	1	210	.04306
	2	263	.09012
	3	181	.10666
	4	205	.14704
	5	55	.15906

Quantitative Data Analyses and Results for Research Question One

Research Question One addressed group differences in leadership styles based on problem solving styles: Is there a significant difference in scores on the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*) between educators based on their preferences for problem solving styles produced by the three *VIEW* dimensions (*OC*: E-e-d-D; *MP*: E-e-i-I; and *WD*: P-p-t-T)?

The Non-Directional Hypothesis for Research Question One states that there would be a significant difference in scores on the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*) between educators based on their preferences for problem solving styles produced by the three *VIEW* dimensions (*OC*: E-e-d-D; *MP*: E-e-i-I; and *WD*: P-p-t-T).

One 4×4×4 multivariate analysis of variance (MANOVA) was conducted. The analysis was multivariate because there were multiple dependent variables, the mean scores of the MLQ leadership subscales (transformational leadership, transactional leadership, and passive/avoidant leadership) for each research participant (Gall et al., 2007). It was a 4×4×4 because there were three independent variables, the average scores of *VIEW* dimensions (Orientation to Change, Manner of Processing, and Ways of Deciding), each with four levels. However, it is necessary to verify that some statistical assumptions be met prior to conducting MANOVA.

Multivariate Statistical Assumptions

After data screening and dealing with missing data and possible outliers, and prior to data analysis the researcher addressed the statistical assumptions that underlie multivariate

statistical tests, specifically MANOVA. These assumptions include independence, normality, linearity, and homoscedasticity (Meyers et al., 2006).

Independence. When conducting a MANOVA, the cases that create the levels of an independent variable should be independent of each other (Meyers et al., 2006). In this study, a participant would be in one of four levels for each of the three dimensions (OC, MP, WD) of *VIEW* (Treffinger et al., 2007). For instance, an individual who prefers the well-defined Explorer style would not prefer the Moderate Explorer, Moderate Developer, or well-defined Developer problem solving style in the OC: Explorer-Developer dimension. An illustration of an individual's participation in one subgroup for each dimension is demonstrated in Table 18. It further implies that the subgroups for each dimension are independent of each other.

Table 18

Distribution by VIEW Dimensions (n= 352)

Dimension and Levels	<i>n</i>	%
Orientation to Change		
Well-Defined Explorer	42	11.93
Moderate Explorer	92	26.14
Moderate Developer	144	40.91
Well-Defined Developer	74	21.02
	352	100.00
Manner of Processing		
Well-Defined External	75	21.30
Moderate External	121	34.38
Moderate Internal	107	30.40
Well-Defined Internal	49	13.92
	352	100.00
Ways of Deciding		
Well-Defined Person	57	16.19
Moderate Person	145	41.19
Moderate Task	108	30.68
Well-Defined Task	42	11.93
	352	100.00

Normality. The normality of each dependent variable (transformational, transactional, passive/avoidant) was examined in SPSS. It was assessed using both graphical and statistical methods (Tabachnick & Fidell, 2013). The graphical methods used included stem-and-leaf plots, and frequency histograms with an overlay of the normal distribution. These plots were examined for the sample ($n = 352$) data set and by each problem solving style. For example, Figures 3 to 5 portray the frequency histograms of the scores of the three leadership styles with the normal distribution as an overlay on each plot. They imply that the individual dependent variables were fairly normally distributed in the sample.

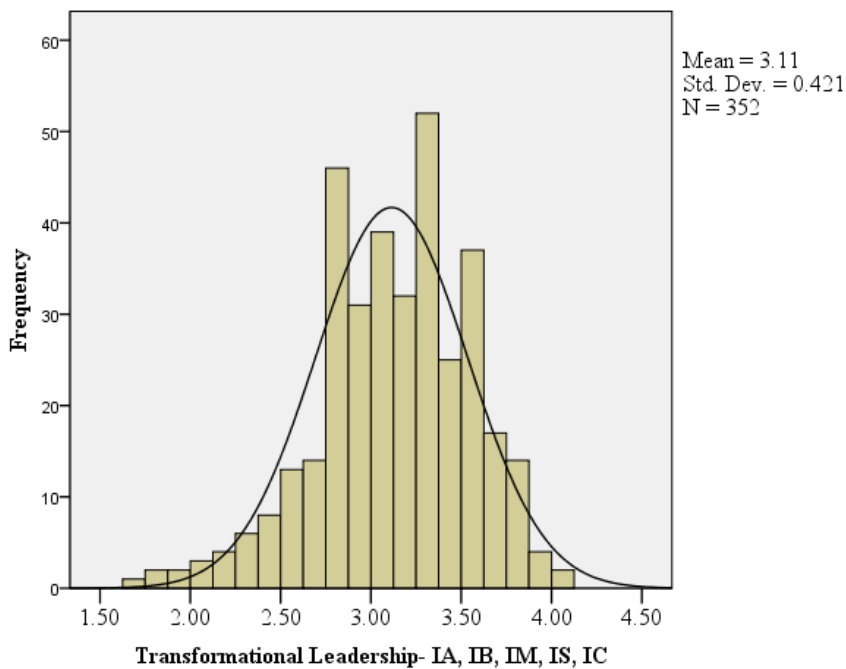


Figure 3. Histogram of Transformational Leadership Scores

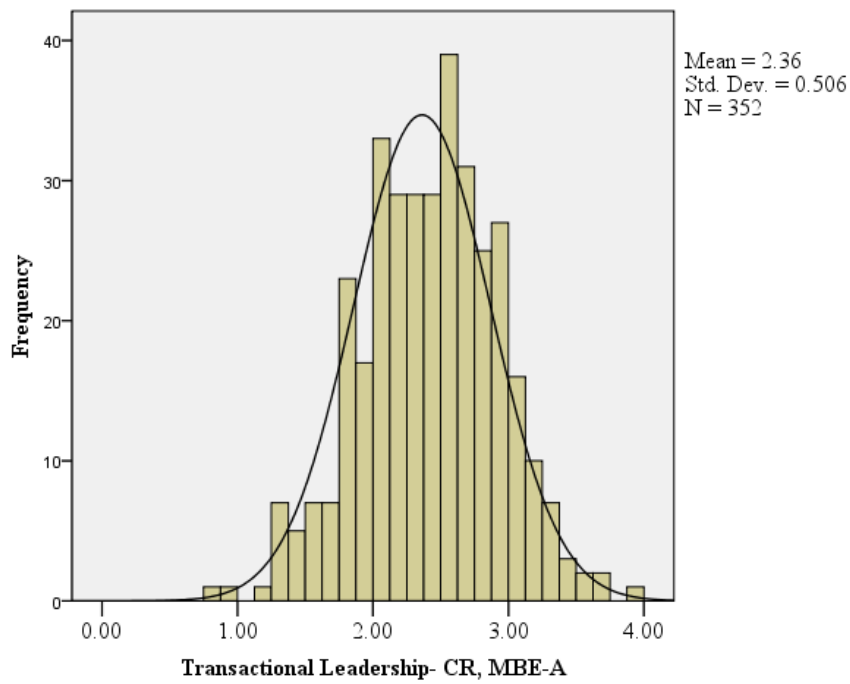


Figure 4. Histogram of Transactional Leadership Scores

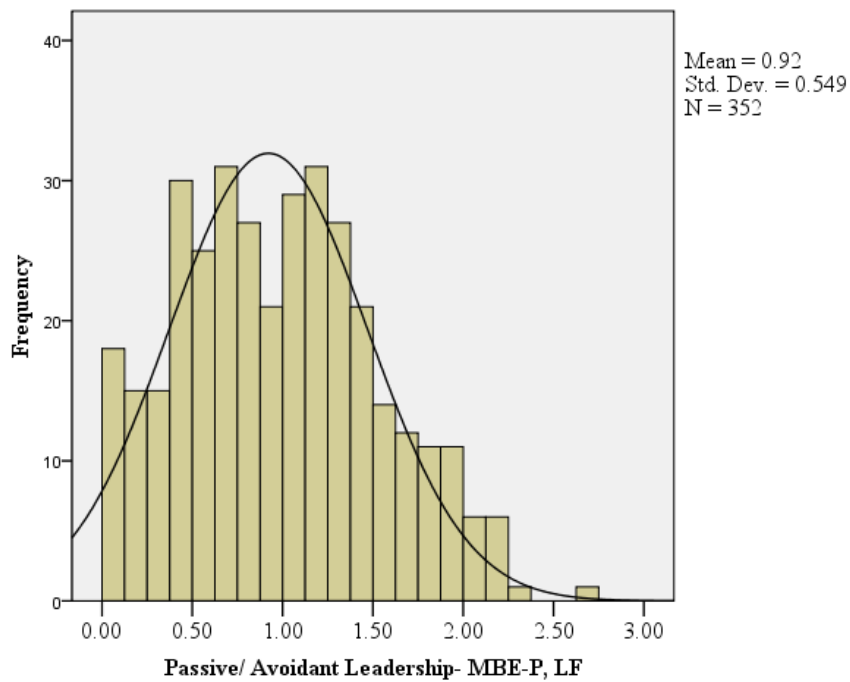


Figure 5. Histogram of Passive/Avoidant Leadership Scores

The statistical components of normality are skewness and kurtosis (Tabachnick & Fidell, 2013). Skewness describes the location of the mean relative to the center of the distribution. In the study, the absolute values of skewness were less than one on all MLQ subscales for all *VIEW* groups, suggesting symmetrical distributions. Kurtosis describes the degree of peakedness of a distribution. The absolute values of kurtosis also were less than one, indicating that the data were normally distributed. Therefore, the data were considered to be approximately normal in shape (Huck, 2008). Refer to Table 19 for the values of skewness and kurtosis by leadership subscale and problem solving style. The researcher's interpretations of these values supported the graphical method that the data could be approximated by a normal distribution for each dependent variable (transformational, transactional, passive/avoidant). The assumption of normality was met.

Table 19

Skewness and Kurtosis for MLQ Subscales (n = 352)

<i>VIEW</i> Dimensions and Levels	Transformational		Transactional		Passive/Avoidant	
	Skewness	Kurtosis	Skewness	Kurtosis	Skewness	Kurtosis
Orientation to Change						
Well-Defined Explorer	-.693	.385	.318	.737	.071	-.577
Moderate Explorer	-.696	.693	-.145	-.456	.382	-.283
Moderate Developer	-.613	.520	-.302	.328	.323	-.715
Well-Defined Developer	-.207	-.026	-.061	-.353	.161	-.482
Manner of Processing						
Well-Defined External	-.423	-.231	.033	.206	.512	.171
Moderate External	-.269	-.165	.228	.049	.332	-.807
Moderate Internal	-.518	.600	-.527	-.009	.187	-.842
Well-Defined Internal	-.625	.136	-.681	-.091	.132	-.499

(continued)

Table 19

Skewness and Kurtosis for MLQ Subscales (n = 352)

<i>VIEW</i> Dimensions and Levels	Transformational		Transactional		Passive/Avoidant	
	Skewness	Kurtosis	Skewness	Kurtosis	Skewness	Kurtosis
Ways of Deciding						
Well-Defined Person	-.118	-.261	.185	-.159	.598	.049
Moderate Person	-.507	.083	-.213	.493	.171	-.700
Moderate Task	-.707	.602	-.170	-.171	.495	-.385
Well-Defined Task	.005	.651	-.168	-.336	-.168	-.686
	-.484	.247	-.140	.042	.304	-.537

Linearity. MANOVA assumes linear relationships among all pairs of dependent variables. If this assumption is not valid, a transformation of the variable would be required to enhance linearity (Tabachnick & Fidell, 2013). Examination of the bivariate scatterplots was demonstrated in the scatterplot matrix of the leadership styles (transformational, transactional, passive/avoidant), Figure 2, in the section about outliers. The scatterplot for each pair of the dependent variables was oval-shaped and non-curvilinear, indicating that the variables were normally distributed and linearly related (Tabachnick & Fidell, 2013).

Homoscedasticity. Homoscedasticity, known as homogeneity of variance-covariance matrices for each dependent variable across groups, is an assumption in multivariate analyses (Tabachnick & Fidell, 2013). The *Box's M* test in Table 20 is not statistically significant ($Box's M = 239.26, p = .83$), indicating that the observed covariance matrices of the leadership subscales were equal across the levels of the independent variables (OC, MP, WP) defined by *VIEW* dimensions. Therefore, there was no violation to the assumption of equality of variance-covariance matrices.

Table 20

Box's M Test of Equality of Covariance Matrices

Statistic	Value
<i>Box's M</i>	239.26
<i>F</i>	.90
<i>df</i> ₁	198
<i>df</i> ₂	5726.74
<i>p</i>	.83

The researcher proceeded with Levene’s Test of Equality of Error Variances for each dependent variable. The evaluation of each MLQ subscale was not statistically significant ($p > .0125$) as Table 21 displays. As a result, the error variances of the mean scores on the MLQ subscales were equal across the subgroups for each of *VIEW* dimensions.

Table 21

Levene’s Test of Equality of Error Variances

MLQ Subscales	<i>F</i>	<i>df</i> ₁	<i>df</i> ₂	<i>p</i>
Transformational Leadership	1.276	61	290	.10
Transactional Leadership	1.341	61	290	.06
Passive / Avoidant	1.368	61	290	.05

Note. Significance at the $p < .0125$ level.

Because the linearity assumption was satisfied among the dependent variables, the Pearson correlation coefficients were computed to determine the degree of the relationship among these variables (Meyers et al., 2006). Table 22 summarizes the intercorrelations among the dependent variables.

Table 22

Correlation Matrix of the MLQ Subscales

	Transformational	Transactional	Passive/Avoidant
Transformational			
Transactional	.30 ^{***}		
Passive/Avoidant	-.38 ^{***}	.13 [*]	

Note. ^{*} $p < .05$, ^{**} $p < .01$, ^{***} $p < .001$.

Specific to MANOVA, a significant Bartlett’s test of sphericity ($p < .0125$) indicates that there is sufficient correlation between the dependent variables to proceed with the multivariate analysis. MANOVA is inefficient when the dependent variables have very low correlations (Meyers et al., 2006). It is most efficient when the correlation is high negative or moderate ($r = .6$) among the dependent variables (Tabachnick & Fidell, 2013). Dependent variables with strong positive correlation ($r = .8$ or $r = .9$) would be redundant (Meyers et al., 2006). Because the absolute values of the correlations between the dependent variables ranged from .13 to .38, the researcher conducted a test of sphericity to examine the assumption of sufficient correlation. Table 23 provides evidence that the Bartlett’s test of sphericity was statistically significant ($p = .001$), indicating that the assumption for sufficient correlation among the three MLQ subscales (transformational, transactional, passive/avoidant) was met.

Table 23

Bartlett’s Test of Sphericity on the MLQ Subscales

Likelihood ratio	.000
Approximate χ^2	109.303
<i>df</i>	5
Significance	.001

In summary, the assumptions of independence, normality, linearity, and homoscedasticity were all satisfied and were indicative to proceed with the multivariate data analyses for Research Question One.

Multivariate Data Analyses and Results

Research Question One addressed educators' differences in leadership styles based on their problem solving styles produced by the three *VIEW* dimensions (OC, MP, WD). MANOVA was conducted using three dependent variables, the MLQ subscales (*transformational*, *transactional*, and *passive/avoidant*), and three independent variables with four levels each (OC: E-e-d-D; MP: E-e-i-I; and WD: P-p-t-T). Because the data were manipulated four times, the Bonferroni adjusted alpha level of .0125 (.05/4) was used to correct for Type I errors (Huck, 2008; Tabachnick & Fidell, 2013).

SPSS reported four values of multivariate tests for the main and interaction effects of *VIEW*'s three dimensions. These values were Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root. The first three statistics were slightly different for each effect, but they all were either significant or not significant. Because each of *VIEW*'s three dimensions had more than two levels, there was more than one degree of freedom, and Pillai's, Wilks' and Hotelling's criteria pooled "the statistic from each dimension to test the effect" (Tabachnick & Fidell, 2013, p. 271). The researcher decided to use Roy's Largest Root, known as Roy's greatest characteristic root (gcr), criterion (Harris, 2001). Roy's gcr "represents the maximum possible between-group difference given the data collected" (Field, 2009, p. 603), and is expected to be the most powerful statistic (Field, 2009).

The results of the multivariate analysis indicated that the differences between the scores on the MLQ leadership subscales were significant ($F(3, 290) = 8.24, p < .001, \text{partial } \eta^2 = .079$) for the OC group. The differences between the scores on the leadership subscales also were significant ($F(3, 290) = 4.60, p = .004, \text{partial } \eta^2 = .045$) for the MP group. There were no significant differences between the scores on the leadership subscales for the WD

group. There were no significant interactions between *VIEW* groups (*Orientation to Change, Manner of Processing, Ways of Deciding*). Therefore, the non-directional hypothesis that there were significant differences in scores on the MLQ leadership styles (*transformational, transactional, and passive/avoidant*) between educators based on their preferences for problem solving styles produced by the three *VIEW* dimensions (*OC: E-e-d-D; MP: E-e-i-I; and WD: P-p-t-T*) was partially accepted.

The results of the analyses of variance for the MLQ leadership styles and the groups of *VIEW* are presented in Table 24. They indicate statistically significant effects of OC and MP on the leadership styles. The *OC* subgroups accounted for 7.9% of the total variance, and the *MP* subgroups contributed 4.5% of the total variance. Because there were statistically significant multivariate effects, the researcher proceeded to examine separate univariate *F* tests for the dependent variables as a follow-up to the multivariate analysis with an alpha level of .05 (Field, 2009).

Table 24

Multivariate and Univariate Analyses of Variance for the MLQ and Groups of VIEW

Source	Univariate											
	Multivariate			Transformational			Transactional			Passive/Avoidant		
	F^a	p	η^2	F^b	p	η^2	F^b	p	η^2	F^b	p	η^2
OC Group	8.24	.000	.079	6.96	.000	.067	.093	.964	.001	4.44	.005	.044
MP Group	4.60	.004	.045	3.68	.012	.037	.127	.944	.001	3.13	.026	.031
WD Group	1.49	.217	.015	1.14	.335	.012	.820	.484	.008	.81	.488	.008

Note. ^aMultivariate F ratios were generated from Roy's greatest characteristic root criterion, $df=3, 290$, significance at the $p < .0125$ level; ^bUnivariate $df=3, 290$, significance at the $p < .05$ level.

Univariate analysis. Because of equal error variances of the mean scores on the MLQ subscales across the subgroups for each of VIEW dimensions, a univariate analysis of variance, ANOVA, was run for each dependent variable (Meyers et al, 2006). The difference between univariate and multivariate analyses of variance is that ANOVA analyzes one dependent variable at a time (Gall et al., 2007). The multivariate statistical assumptions of independence, normality, linearity, and homoscedasticity also underlie the univariate analysis (Meyers et al., 2006).

The univariate analysis showed that the OC subgroups (*well-defined Explorer, moderate Explorer, moderate Developer, well-defined Developer*) differed significantly in both areas of transformational leadership ($F(3, 290) = 6.96, p < .001, \text{partial } \eta^2 = .067$) and passive/avoidant leadership ($F(3, 290) = 4.44, p = .005, \text{partial } \eta^2 = .044$). The results of the univariate analysis also confirmed that the MP subgroups (*well-defined External, moderate External, moderate Internal, well-defined Internal*) differed significantly in the area of transformational leadership ($F(3, 290) = 3.68, p = .012, \text{partial } \eta^2 = .037$) and passive/avoidant leadership ($F(3, 290) = 3.13, p = .026, \text{partial } \eta^2 = .031$). There were no significant differences in mean scores of transactional for the OC and MP subgroups. There were no significant differences in mean scores of all types of leadership for WD subgroups (*well-defined Person, moderate Person, moderate Task, well-defined Task*).

Therefore, the non-directional hypothesis that:

- a. there was a significant difference in scores on the MLQ leadership styles (*transformational, transactional, and passive/avoidant*) between educators on the Orientation to Change dimension who prefer the well-defined Explorer (E),

moderate Explorer (e), moderate Developer (d), or well-defined Developer (D) Problem-Solving Style was partially accepted.

- b. there was a significant difference in scores on the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*) between educators on the Manner of Processing dimension who prefer the well-defined External (E), moderate External (e), moderate Internal (i), or well-defined Internal (I) Problem-Solving Style was partially accepted.
- c. there was a significant difference in scores on the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*) between educators on the Ways of Deciding dimension who prefer the well-defined Person (P), moderate Person (p), moderate Task (t), or well-defined Task (T) Problem-Solving Style was rejected.
- d. there were significant interactions among the three *VIEW* dimensions (*OC*, *MP*, *WD*) for the three leadership styles (*transformational*, *transactional*, and *passive/avoidant*) was rejected.

The focus of attention would be *VIEW*'s Orientation to Change and Manner of Processing because they had statistically significant ($p < .05$) effects for transformational leadership and passive/avoidant leadership subscales, but not for transactional leadership. Therefore, the significant multivariate effects were in part due to the impact of Orientation to Change and Manner of Processing on the transformational and passive/avoidant leadership of the participants in the study.

Post hoc tests. Post hoc tests were performed for all three dependent variables despite having statistical significance for the transformational and passive/avoidant

leadership subscales. Because the omnibus F test for the transactional leadership subscale was not statistically significant ($p > .05$), related pairwise comparisons were not examined (Meyers et al., 2006). The Tukey HSD procedure was used to run the post hoc tests because it is a moderately conservative procedure that considers all pairwise comparisons and controls the overall error rate (Meyers et al., 2006). Table 25 displays the descriptive statistics for each of the MLQ leadership subscales and *VIEW* subgroups.

Table 25

Descriptive Statistics for MLQ Subscales on VIEW Subgroups

<i>VIEW</i> Subgroups	<i>n</i>	Transformational		Transactional		Passive/Avoidant	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Orientation to Change							
Well-defined Explorer (E)	42	3.22 _a	.48	2.32	.48	.91 _a	.52
Moderate Explorer (e)	92	3.22 _{a,c}	.40	2.36	.46	.80 _a	.51
Moderate Developer (d)	144	3.09 _{a,d}	.43	2.35	.52	.89 _a	.55
Well-defined Developer (D)	74	2.97 _b	.36	2.41	.54	1.13 _b	.57
Manner of Processing							
Well-defined External (E)	75	3.19 _a	.38	2.34	.44	.97 _a	.56
Moderate External (e)	121	3.14 _{a,c}	.41	2.36	.54	.79 _b	.52
Moderate Internal (i)	107	3.07 _d	.43	2.38	.53	1.00 _a	.54
Well-defined Internal (I)	49	3.01 _b	.48	2.34	.48	.99 _a	.57

(continued)

Table 25

Descriptive Statistics for MLQ Subscales on VIEW Subgroups

<i>VIEW</i> Subgroups	<i>n</i>	Transformational		Transactional		Passive/Avoidant	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Ways of Deciding							
Well-defined Person (P)	57	3.12	.36	2.27	.51	.92	.58
Moderate Person (p)	145	3.10	.46	2.34	.52	.94	.54
Moderate Task (t)	108	3.15	.42	2.43	.49	.87	.55
Well-defined Task (T)	42	3.06	.37	2.40	.49	.99	.54

Note. a, b, c, d Means in a column sharing subscripts are significantly ($p < .05$) different from each other. For all measures, higher means indicate higher scores for that leadership style. For Orientation to Change, in the area of transformational leadership, E, e, d > D and e > d, and in the area of passive/avoidant leadership, D > E, e, d. For Manner of Processing, in the area of transformational leadership, E, e > I and e > I, and in the area of passive/avoidant leadership, E, i, I > e.

All *VIEW* groups scored the highest on transformational leadership and the lowest on passive/avoidant leadership. In the area of transformational leadership, well-defined Explorers ($M = 3.22, SD = .48$), moderate Explorers ($M = 3.22, SD = .40$), and moderate Developers ($M = 3.09, SD = .43$) scored significantly ($p < .05$) higher than those described as well-defined Developers ($M = 2.97, SD = .36$). Moderate Explorers ($M = 3.22, SD = .40$) also scored significantly ($p < .05$) higher than moderate Developers ($M = 3.09, SD = .43$). Well-defined Externals ($M = 3.19, SD = .38$) and moderate Externals ($M = 3.14, SD = .41$) scored significantly ($p < .05$) higher than those described as well-defined Internals ($M = 3.01, SD = .48$). Moderate Externals ($M = 3.14, SD = .41$) scored significantly ($p < .05$) higher than those described as moderate Internals ($M = 3.07, SD = .43$). This means that the subgroup of a dimension with higher transformational scores tends to be more transformational than the subgroup or subgroups with lower scores.

In the area of passive/avoidant leadership, well-defined Developers ($M = 1.13, SD = .57$) scored significantly ($p < .05$) higher than those described as well-defined Explorers ($M = .91, SD = .52$), moderate Explorers ($M = .80, SD = .51$) and moderate Developers ($M = .89, SD = .55$). Well-defined Externals ($M = .97, SD = .56$), moderate Internals ($M = 1.00, SD = .54$) and well-defined Internals ($M = .99, SD = .57$) scored significantly ($p < .05$) higher than the moderate Externals ($M = .79, SD = .52$). This implies that the subgroup of a dimension with higher passive/avoidant scores tends to demonstrate more passive/avoidant behavior than the subgroup or subgroups with lower scores.

There were no significant differences in mean scores of transformational leadership and in mean scores of passive/avoidant leadership between the WD Person-Task subgroups.

Neither were there significant differences in mean scores of transactional leadership between the subgroups of each of *VIEW* groups.

Quantitative Data Analysis and Results for Research Question Two

Research Question Two focused on the extent to which the types of leadership produced by the MLQ (*transformational*, *transactional*, and *passive/avoidant*) each was predicted by the dimensions of problem solving style (*OC*, *MP*, and *WD*), gender, years of teaching experience, highest degree earned, and type of certificate.

The non-directional hypothesis for Research Question Two states that the dimensions of problem solving (*OC*, *MP*, and *WD*), gender, years of teaching experience, highest degree earned, and type of certificate will predict the types of educators' leadership produced by the MLQ (*transformational*, *transactional*, and *passive/avoidant*).

Three statistical regressions, also known as stepwise multiple linear regressions (MLRs), were used to predict variances in the leadership scores for K-12 educators, one MLR for each leadership style. The results were analyzed with the Bonferroni adjusted alpha set at the .0125 level. The following independent variables were entered for each of the three MLRs: *VIEW* three scores (*OC*, *MP*, *WD*), gender, years of experience in education, highest degree earned, and type of certificate. In a stepwise linear regression, the computer determines the order of entry based on statistical criteria (Tabachnick & Fidell, 2013) in which the independent variables become a part of the regression equation (Huck, 2008, p. 423). In step one of the regression, the independent variable that is highly correlated with the dependent variable is the one that enters the equation first. In later steps of the regression, the independent variable that enters the equation next is the one that contributes significantly to R^2 , the percentage of variation in the dependent variable (Tabachnick & Fidell, 2013). The

computer also may eliminate an already entered independent variable that does not contribute significantly to the model (Tabachnick & Fidell, 2007).

Prior to conducting the regression analyses the researcher verified that the assumptions of a multiple linear regression were met.

Statistical Regression Assumptions

As described earlier, data were screened and cleaned prior to running the statistical regression. The researcher addressed the statistical assumptions that underlie multiple linear regressions. These assumptions include: (a) ratio of cases to independent variables; (b) detection of outliers among the independent variables and on the dependent variables; (c) absence of multicollinearity and singularity; and (d) normality, linearity, and homoscedasticity of residuals (Tabachnick & Fidell, 2013).

Ratio of cases to independent variables. For a multiple linear regression procedure, a sample of size N is required, such that $N \geq 50 + 8m$, where m is the number of independent variables (Tabachnick & Fidell, 2013). Because there are seven predictors of leadership scores a sample size of 106 would be sufficient. However, a statistical stepwise regression requires “a cases-to-IV ratio of 40 to 1” (Tabachnick & Fidell, 2013, p. 124) to be able to generalize the findings to similar settings, indicating that a sample size of at least 280 is realistic to offset the loss of potential records with missing values in any of the variables. Therefore, the sample size of 352 in this study was deemed as sufficient to conduct the regression analysis.

Outliers among the variables. Visual inspection of the data to detect outliers for the criterion variables and the predictor variables was completed prior to data analysis (Meyers et al., 2006). As it was explained for the multivariate analysis of variance, none of the cases

was considered an extreme outlier for the criterion variables (transformational, transactional, and passive/avoidant). In regression, cases were evaluated with respect to each independent variable, specifically the three dimensions of *VIEW* (Tabachnick & Fidell, 2013). Other predictor variables were not considered for univariate outliers because they were either dichotomous or categorical. However, they were included for multivariate outliers.

Univariate outliers. To detect univariate outliers, the researcher visually inspected the histograms, the box plots, and normal probability plots for each of the three predictor variables (OC, MP, WD). Visual inspection detected five outliers for Orientation to Change, two for Manner of Processing, and three for Ways of Deciding, but they were all within the ranges of possible values for these dimensions. They were not considered for deletion because the skewness and kurtosis values supported normality of the distribution of scores of these dimensions.

The normality of each independent variable (OC, MP, WD) was examined in SPSS. It was assessed using both graphical and statistical methods (Tabachnick & Fidell, 2013). The graphical methods used included stem-and-leaf plots, and frequency histograms. These plots were examined for the sample ($n = 352$) data set. Figures 6 to 8 portray the frequency histograms of the scores of the three problem solving styles with the normal distribution as an overlay on each plot. They imply that the individual independent variables were fairly normally distributed in the sample.

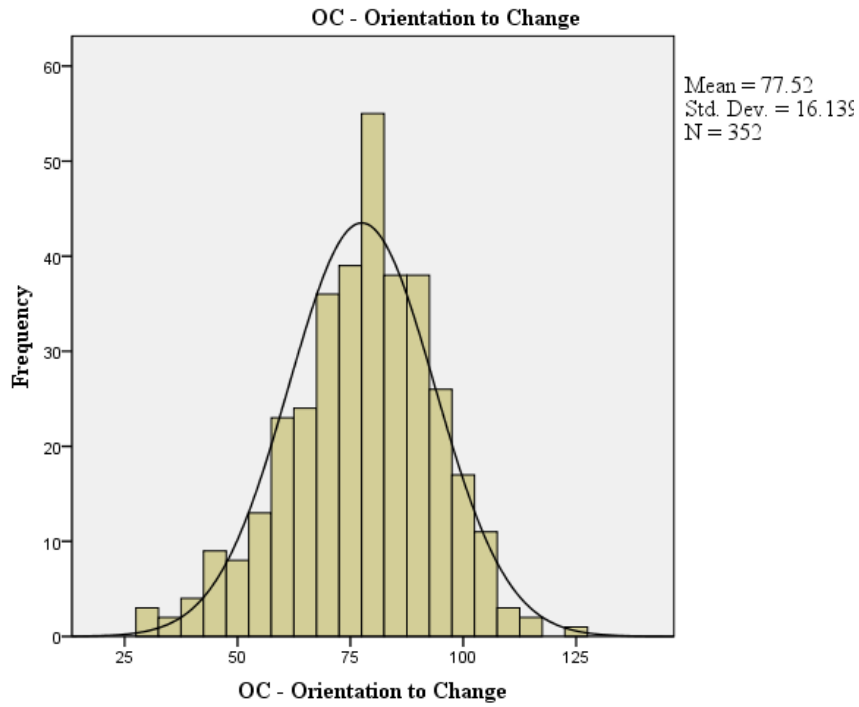


Figure 6. Histogram of VIEW's Orientation to Change Scores

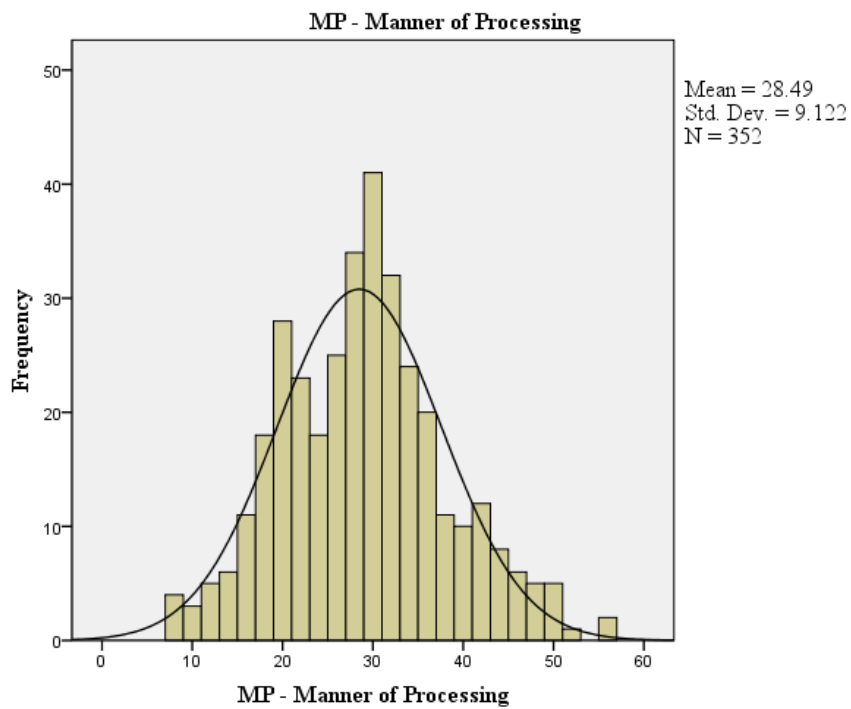


Figure 7. Histogram of VIEW's Manner of Processing Scores

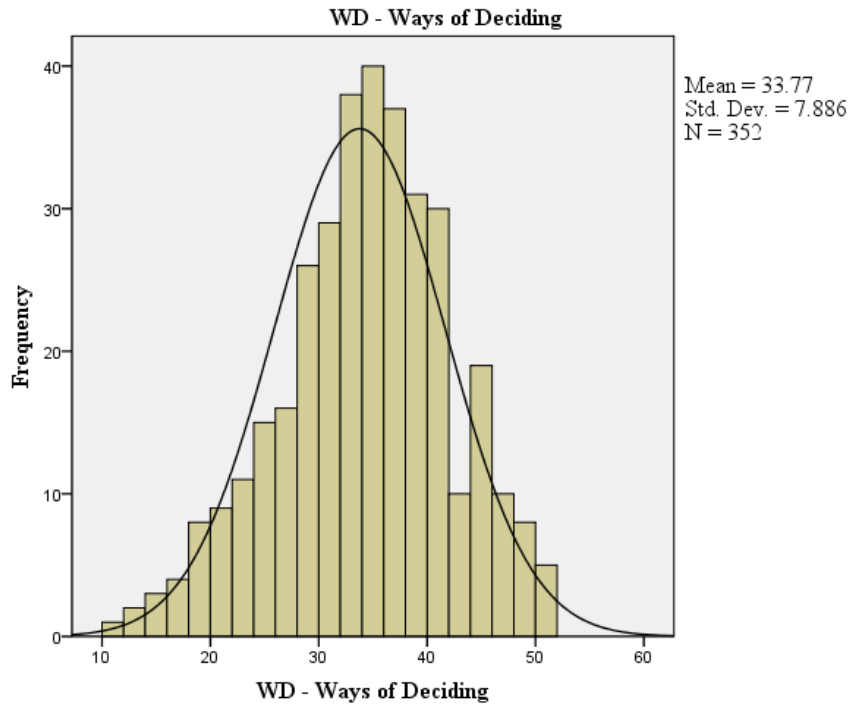


Figure 8. Histogram of VIEW's Way of Deciding Scores

The statistical components of normality are skewness and kurtosis (Tabachnick & Fidell, 2013). Skewness describes the location of the mean relative to the center of the distribution. In the study, the absolute values of skewness were less than one on all *VIEW* dimensions, suggesting symmetrical distributions. Kurtosis describes the degree of peakedness of a distribution. The absolute values of kurtosis also were less than one, indicating that the data were normally distributed. Therefore, the data were considered to be approximately normal in shape (Huck, 2008). Refer to Table 26 for the values of skewness and kurtosis by problem solving style. The researcher's interpretations of these values supported the graphical method that the data could be approximated by a normal distribution. The assumption of normality was met.

Table 26

Descriptive Statistics for VIEW's Dimensions

Statistic	Orientation to Change	Manner of Processing	Ways of Deciding
Mean	77.52	28.49	33.77
Standard Deviation	16.14	9.12	7.89
Skewness	-.36	.27	-.27
Kurtosis	.16	-.02	-.07
Range	30-123	8-56	11-51

Multivariate outliers. The researcher computed each case's Mahalanobis distance (D^2) to identify multivariate outliers among the seven predictor variables: (a) gender, (b) years of teaching experience, (c) highest degree earned, and (d) the three dimensions of *VIEW* (OC, MP, WD). It is a statistic that measures the multivariate "distance" between each case and the multivariate mean of each group (Tabachnick & Fidell, 2013). Each case's distance was then compared to the chi-square criterion, which was evaluated as $\chi^2(7, N = 352) = 24.322$, at a stringent significance level of .001 (Meyers et al., 2006), where 24.322 was the largest D^2 value calculated. Case 279 ($D^2 = 25.30$) was identified as a multivariate outlier because its value exceeded the χ^2 criterion (Meyers et al., 2006), and was removed from the data set leaving a sample of size $n = 351$. Mahalanobis distance (D^2) was computed again after the removal of the multivariate outlier. Table 27 summarizes the new Mahalanobis distances for the extreme cases that SPSS identified. Because none of the new values exceeded the χ^2 criterion, the researcher concluded that there were no other multivariate outliers.

Table 27

Extreme Values for the Mahalanobis Distance (n = 351)

Mahalanobis Distance		Case Number	Value
Highest	1	53	23.11
	2	299	20.25
	3	96	19.99
	4	293	19.88
	5	308	18.12
Lowest	1	344	.61
	2	151	.70
	3	110	.77
	4	336	.85
	5	166	.87

Multicollinearity and singularity. In multiple regression, the coefficients matrix is inverted to calculate the regression coefficients. The matrix inversion is impossible if the independent variables were multicollinear (Tabachnick & Fidell, 2013). Singularity and multicollinearity exist through very high squared multiple correlations (SMC) among the independent variables or very low tolerances ($1 - \text{SMC}$; Tabachnick & Fidell, 2013). Low tolerance values indicate high correlations between the predictor variables (Meyers et al., 2006). An independent variable that is highly correlated with another variable that is already in the regression equation may not be entered in the equation, because it may inflate the

regression coefficients or it may not be needed in the regression (Tabachnick & Fidell, 2013). Meyers et al. (2006) suggested examining the intercorrelations between the independent variables and then deleting one of the variables that are strongly correlated (.8 to .9). Pearson *r* correlations among the seven predictors were examined. All these variables were correlated, but none of the correlations were high enough to consider the option of deleting a predictor variable. Refer to Table 28 for the values of these correlations.

Table 28

Intercorrelations for the Regression Criterion Variables and Predictor Variables and (n = 351)

	1	2	3	4	5	6	7
Criterion Variables							
Transformational	-.236 ^{***}	-.080	.006	.170 ^{***}	.205 ^{***}	.283 ^{***}	.282 ^{***}
Transactional	.032	.030	.114 [*]	-.018	-.069	-.022	-.006
Passive/Avoidant	.122 [*]	.028	.029	-.085	-.127 ^{**}	-.114 [*]	-.220 ^{***}
Predictor Variables							
1. Orientation to Change		-.031	.071	.101	-.141 ^{**}	-.065	-.095
2. Manner of Processing			.083	-.144 ^{**}	.052	-.050	-.052
3. Ways of Deciding				-.158 ^{**}	-.097	.004	.006
4. Gender					.007	.015	-.101
5. Years of Experience						.406 ^{**}	.353 ^{**}
6. Highest Degree Earned							.560 ^{**}
7. Type of Certificate							

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Because the correlations among the predictor variables were low to medium, the tolerance values exceeded .10 (Tabachnick & Fidell, 2013) as it is shown in Table 29. Two other values could be inspected to ensure absence of multicollinearity. They are the Variance Inflation Factor (*VIF*) statistic in Table 29 and the Condition Index in Table 30. The Variance Inflation Factor is the reciprocal of tolerance, and so it is expected to be less than 10 (Myers, 1990). The Condition Index measures the dependency of one variable on other predictor variables, and it is expected to be less than 30 (Tabachnick & Fidell, 2013).

Table 29

Tolerance and Variance Inflation Factor

Predictor Variables	Tolerance	<i>VIF</i>
1. Orientation to Change	.786	1.273
2. Manner of Processing	.631	1.584
3. Ways of Deciding	.652	1.535
4. Gender	.962	1.040
5. Years of Experience	.963	1.038
6. Highest Degree Earned	.953	1.050
7. Type of Certificate	.930	1.075

High values of the Condition Index for a given dimension accompanied with large variance proportions greater than .50 for at least two different variables would be problematic (Tabachnick & Fidell, 2013). Refer to Table 30 for values of the Condition Index and variance proportions of the predictor variables. All values of the Condition Index were less than 30. Although the two predictors, highest degree earned and type of certificate, had high

variance proportions of .68 and .54 respectively, the researcher decided not to delete the variable with the higher variance proportion because the Condition Index for dimension 6 did not exceed 30 and her goal of analysis is prediction (Tabachnick & Fidell, 2013). Therefore, the assumption of absence of multicollinearity and singularity was not violated. All predictor variables were used in the regression analysis.

Table 30

Condition Index and Variance Proportions of the Predictor Variables

Dimension	Condition Index	Variance Proportions						
		Orientation to Change	Manner of Processing	Ways of Deciding	Gender	Years of Experience	Highest Degree Earned	Type of Certificate
1	1.00	.00	.00	.00	.00	.00	.00	.00
2	6.35	.02	.03	.02	.02	.43	.02	.02
3	8.62	.00	.40	.00	.01	.26	.08	.11
4	9.30	.02	.18	.01	.29	.16	.03	.13
5	11.59	.03	.24	.45	.19	.12	.05	.02
6	13.71	.10	.00	.08	.00	.01	.68	.54
7	14.14	.57	.00	.21	.23	.00	.14	.10
8	28.43	.25	.14	.23	.26	.01	.01	.06

Normality, linearity, and homoscedasticity of residuals. The analysis of residuals produced by SPSS is an option to test the three MLR assumptions of normality, linearity, and homoscedasticity at the same time (Tabachnick & Fidell, 2013). SPSS residual scatterplots show standardized predicted scores on the x-axis and standardized errors of prediction on the y-axis. Screening procedures of the residuals scatterplots involve examination of the following: (a) normality – the residuals pile up symmetrically in the center of the plot for each value of a predicted score if the assumption of normality is satisfied; (b) linearity – the residuals are linearly related with the predicted dependent variable scores; (c) homoscedasticity – the standard deviations of errors of prediction are equivalent for all predicted dependent variable scores; and (d) whether the residuals are almost rectangularly distributed and concentrated along the center if all three assumptions are met (Tabachnick & Fidell, 2013).

The researcher ran SPSS Casewise Diagnostics on the 351 cases looking for outliers and eliminating the new ones. She then ran the analysis in an iterative way until SPSS did not produce the Casewise Diagnostics output (Meyers, 2006). Six cases were deleted in three runs. Cases 58, 74, and 196 were detected in the first run with transformational leadership as the criterion. Cases 70 and 326 were identified in the second run, and case 83 in the third run with transactional leadership as the dependent variable. No cases were diagnosed in the run on passive/avoidant. Figures 9 through 11 display the residuals scatterplots using the three dimensions of *VIEW* (Orientation to Change, Manner of Processing, Ways of Deciding), gender, years of experience, highest degree earned, and type of certificate as the predictor variables and each of the MLQ leadership styles (transformational, transactional, passive/avoidant) as the criterion variable. The residuals in each of the three scatterplots are

almost rectangularly distributed and are concentrated along the center, indicating that the assumptions of normality, linearity, and homoscedasticity were met simultaneously.

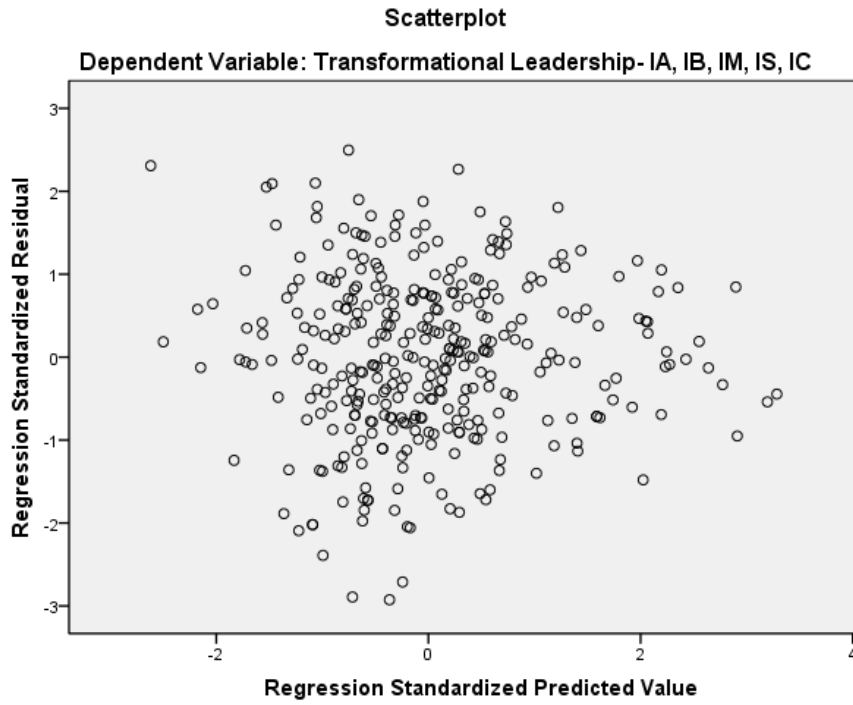


Figure 9. Residuals vs. Predicted Values of Transformational Leadership

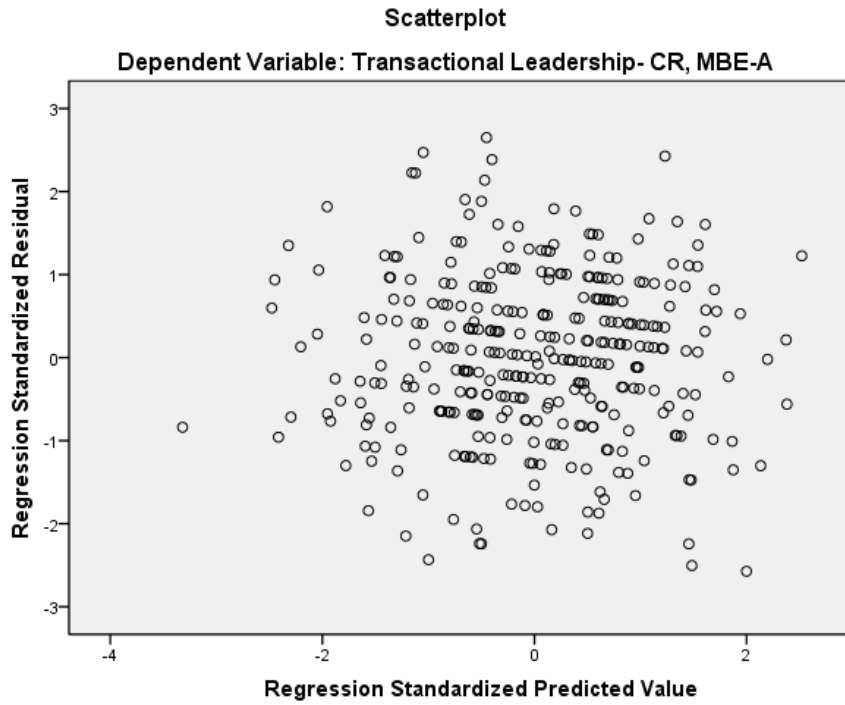


Figure 10. Residuals vs. Predicted Values of Transactional Leadership

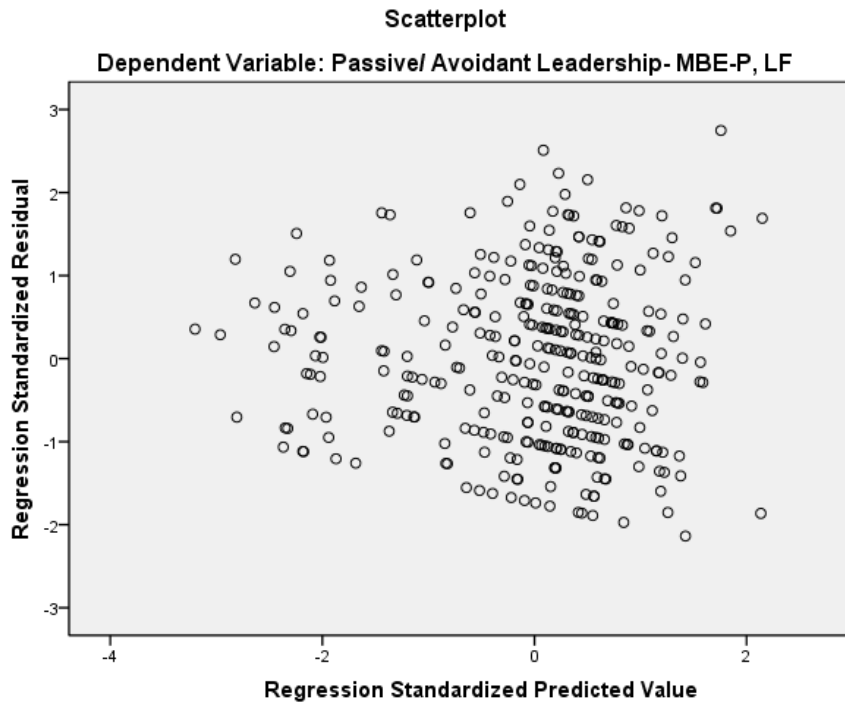


Figure 11. Residuals vs. Predicted Values of Passive/Avoidant Leadership

Descriptive statistics for statistical regression. Seven outliers (58, 70, 74, 83, 196, 279, and 326) were removed. Once these outliers were removed and the assumptions for a stepwise multiple regression were confirmed by screening the residuals scatterplot of each of the criterion variables, the researcher examined the distributions of the continuous data representing the predictor variables and criterion variables. Table 31 displays the descriptive statistics of the data used for Research Question Two. The means, minimum scores, and maximum scores were within possible values. The absolute values of skewness and kurtosis for each variable were less than 1, indicating that the distribution of the scores of each variable could be approximated by a normal distribution (Meyers et al., 2006).

Table 31

Descriptive Statistics for Selected Predictor Variables and Criterion Variables (n = 345)

Variables	Minimum	Maximum	Mean	<i>SD</i>	Skewness	Kurtosis
Predictor Variables						
Orientation to Change	30	123	77.58	16.25	-.36	.14
Manner of Processing	8	56	28.30	9.00	.23	-.11
Ways of Deciding	11	51	33.72	7.92	-.27	-.10
Criterion Variables						
Transformational	1.85	4.00	3.12	.41	-.34	-.08
Transactional	1.13	3.63	2.37	.48	-.07	-.30
Passive/Avoidant	.00	2.63	.91	.55	.31	-.52

Statistical Regression Analysis and Results

MLR – Transformational leadership. A stepwise multiple regression was conducted with the MLQ transformational leadership subscale as the criterion variable and dimensions of problem solving style (*OC*, *MP*, and *WD*), gender, years of teaching experience, highest degree earned, and type of certificate as the predictor variables.

As it was shown, multivariate outliers were identified and removed from the sample, yielding 345 cases for statistical regression analysis. The assumptions of multicollinearity, normality, linearity, and homoscedasticity also were verified prior to analyzing the data for the statistical regression on transformational leadership. Pearson r correlations among the seven predictors were examined. All these variables were correlated, but none of the correlations were high enough to consider the option of deleting a predictor variable. Refer to Table 32 for the values of these correlations.

Table 32

Intercorrelations for the Transformational Subscale and Predictor Variables and (n = 345)

	1	2	3	4	5	6	7
Criterion Variable							
Transformational	-.236 ^{***}	-.080	.006	.170 ^{***}	.205 ^{***}	.283 ^{***}	.282 ^{***}
Predictor Variables							
1. Orientation to Change		-.031	.071	.101	-.141 ^{**}	-.065	-.095
2. Manner of Processing			.083	-.144 ^{**}	.052	-.050	-.052
3. Ways of Deciding				-.158 ^{**}	-.097	.004	.006
4. Gender					.007	.015	-.101
5. Years of Experience						.406 ^{**}	.353 ^{**}
6. Highest Degree Earned							.560 ^{**}
7. Type of Certificate							

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Data analysis – transformational leadership. Refer to Tables 33 through 36 that were used for data analysis: (a) the ANOVA results, (b) the model summary for transformational leadership as the criterion, (c) the coefficients of the prediction model, and (d) the excluded variables from the model.

Table 33 displays the results of the ANOVA indicated that the highest degree earned, Orientation to Change, gender, and type of certificate were significant predictors of the variance in the mean scores of transformational leadership, $R^2 = .189$, adjusted $R^2 = .179$, $F(4, 338) = 19.673, p < .001$. Together the four variables (highest degree earned, Orientation to Change, gender, type of certificate) explained 17.9% of the variation in transformational leadership scores, $f^2 = .22$, small.

The model summary in Table 34 shows that predictor variables entered the regression equation in four steps to predict the scores of transformational leadership. In each step the computer selected a predictor variable to enter the model based on its correlation with the criterion variable. Once the variable enters the model, a change in the squared multiple correlation ΔR^2 occurs. R^2 is the coefficient of multiple determination (Meyers et al., 2006). It depicts the amount of variation of the criterion variable that can be explained by the combination of the predictor variables in the model. In the first step, the highest degree earned entered the equation ($t = 5.45, p < .001$) yielding a change in the squared multiple correlation of $\Delta R^2 = .08$. In the second step, Orientation to Change: Explorer-Developer entered the equation ($t = -4.307, p < .001$), yielding an additional change in the squared multiple correlation of $\Delta R^2 = .048$. In the third step, gender entered ($t = 3.883, p < .001$) yielding an additional change in the squared multiple correlation of $\Delta R^2 = .037$. In the fourth

step, the type of certificate entered ($t = 3.163, p = .002$) yielding an additional change in the squared multiple correlation of $\Delta R^2 = .024$.

Table 33

ANOVA Results for Transformational Leadership as the Criterion Variable

Model	<i>SSE</i>	<i>df</i>	<i>MSE</i>	<i>F</i>	<i>Sig</i>
1 Regression	4.40	1	4.40	29.70	.000 ^a
Residual	50.55	341	.15		
Total	54.95	342			
2 Regression	7.02	2	3.51	24.89	.000 ^b
Residual	47.93	340	.14		
Total	54.95	342			
3 Regression	9.06	3	3.02	22.30	.000 ^c
Residual	45.89	339	.14		
Total	54.95	342			
4 Regression	10.38	4	2.59	19.67	.000 ^d
Residual	44.57	338	.13		
Total	54.95	342			

Note. ^aPredictors: (Constant), Highest Degree Earned; ^bPredictors: (Constant), Highest Degree Earned, OC – Orientation to Change; ^cPredictors: (Constant), Highest Degree Earned, OC – Orientation to Change, Gender (1 for male; 2 for female); ^dPredictors: (Constant), Highest Degree Earned, OC – Orientation to Change, Gender (1 for male; 2 for female), Certification Status (1 for non-092; 2 for 092).

Table 34

Model Summary for Transformational Leadership as the Criterion Variable

Model	<i>R</i>	<i>R</i> ²	<i>Adjusted R</i> ²	<i>SE</i>	<i>Change Statistics</i>				
					ΔR^2	ΔF	<i>df</i> ₁	<i>df</i> ₂	<i>Sig. ΔF</i>
1	.283 ^a	.080	.077	.385	.080	29.698	1	341	.000
2	.357 ^b	.128	.123	.375	.048	18.547	1	340	.000
3	.406 ^c	.165	.157	.368	.037	15.077	1	339	.000
4	.435 ^d	.189	.179	.363	.024	10.005	1	338	.002

Note. ^aPredictors: (Constant), Highest Degree Earned; ^bPredictors: (Constant), Highest Degree Earned, OC – Orientation to Change; ^cPredictors: (Constant), Highest Degree Earned, OC – Orientation to Change, Gender (1 for male; 2 for female); ^dPredictors: (Constant), Highest Degree Earned, OC – Orientation to Change, Gender (1 for male; 2 for female), Certification Status (1 for non-092; 2 for 092).

Results – transformational leadership. Table 35 shows the coefficients of the stepwise regression model that predicts the scores for transformational leadership. The prediction equation is

$$\text{Predicted transformational leadership score} = 2.795 + .093 \times \text{Highest Degree Earned} - .006 \times \text{Orientation to Change} + .192 \times \text{Gender} + .200 \times \text{Type of Certificate}.$$

The stepwise multiple regression results suggested that educators who have advanced degrees, who preferred the Explorer style to solve problems and met the administrative certificate requirements were more likely to have high scores on MLQ transformational leadership subscale. Based on the results female educators scored higher on transformational leadership than male educators did. There were more female educators in the study ($n = 254$) than males ($n = 97$). One participant did not provide gender information.

Table 36 displays how the predictor variables were excluded from the model in the four steps. Three predictor variables (MP, WD, years of experience) were not significant ($p > .0125$), and were excluded from the model in the fourth step. Therefore, the non-directional hypothesis for Research Question Two that the dimensions of problem solving (OC, MP, and WD), gender, years of teaching experience, highest degree earned, and type of certificate significantly predicted the scores of educators' transformational leadership was partially accepted.

Table 35

Stepwise Regression Analysis Predicting Transformational Leadership

Predictor Variables	<i>B</i>	<i>SE B</i>	β	<i>t</i>	Sig.	Collinearity Statistics	
						Tolerance	<i>VIF</i>
Model 1							
Constant	2.767	.069		39.949	.000		
Highest Degree Earned	.166	.031	.283	5.450	.000	1.000	1.000
Model 2							
Constant	3.202	.122		26.350	.000		
Highest Degree Earned	.158	.030	.269	5.296	.000	.996	1.004
Orientation to Change	-.005	.001	-.219	-4.307	.000	.996	1.004

(continued)

Table 35

Stepwise Regression Analysis Predicting Transformational Leadership

Predictor Variables	<i>B</i>	<i>SE B</i>	β	<i>t</i>	Sig.	Collinearity Statistics	
						Tolerance	<i>VIF</i>
Model 3							
Constant	2.943	.137		21.559	.000		
Highest Degree Earned	.157	.029	.267 ^{***}	5.365	.000	.996	1.004
Orientation to Change	-.006	.001	-.239 ^{***}	-4.774	.000	.985	1.015
Gender	.174	.045	.194 ^{***}	3.883	.000	.989	1.011
Model 4							
Constant	2.795	.143		19.595	.000		
Highest Degree Earned	.093	.035	.158 ^{***}	2.642	.009	.669	1.496
Orientation to Change	-.006	.001	-.228 ^{***}	-4.613	.000	.981	1.020
Gender	.192	.045	.214 ^{***}	4.301	.000	.974	1.027
Certification Status	.200	.063	.191 ^{***}	3.163	.002	.658	1.520

Note. ^{***} $p < .0125$.

Table 36

Excluded Variables from Stepwise Regression Analysis Predicting Transformational Leadership

Excluded Variables	<i>Beta</i> In	<i>t</i>	Sig.	Partial Correlations	Collinearity Statistics		
					Tolerance	<i>VIF</i>	Minimum Tolerance
Model 1							
Gender	.169 ^a	3.301	.001	.176	1.000	1.000	1.000
Yrs of Experience	.107 ^a	1.877	.061	.101	.831	1.203	.831
Certification Status	.179 ^a	2.851	.005	.153	.673	1.486	.673
Orientation to Change	-.219 ^a	-4.307	.000	-.227	.996	1.004	.996
Manner of Processing	-.066 ^a	-1.275	.203	-.069	.998	1.002	.998
Ways of Deciding	.004 ^a	.083	.934	.005	1.000	1.000	1.000

(continued)

Table 36

Excluded Variables from Stepwise Regression Analysis Predicting Transformational Leadership

Excluded Variables	<i>Beta</i> In	<i>t</i>	Sig.	Partial Correlations	Collinearity Statistics		
					Tolerance	<i>VIF</i>	Minimum Tolerance
Model 2							
Gender	.194 ^b	3.883	.000	.206	.989	1.011	.985
Yrs of Experience	.078 ^b	1.393	.164	.075	.818	1.222	.818
Certification Status	.158 ^b	2.577	.010	.139	.669	1.496	.669
Manner of Processing	-.072 ^b	-1.430	.154	-.077	.997	1.003	.993
Ways of Deciding	.021 ^b	.406	.685	.022	.994	1.006	.990

(continued)

Table 36

Excluded Variables from Stepwise Regression Analysis Predicting Transformational Leadership

Excluded Variables	Beta In	t	Sig.	Partial Correlations	Collinearity Statistics		
					Tolerance	VIF	Minimum Tolerance
Model 3							
Yrs of Experience	.076 ^c	1.379	.169	.075	.818	1.222	.818
Certification Status	.191 ^c	3.163	.002	.170	.658	1.520	.658
Manner of Processing	-.046 ^c	-.909	.364	-.049	.976	1.024	.969
Ways of Deciding	.055 ^c	1.094	.275	.059	.965	1.036	.960
Model 4							
Yrs of Experience	.051 ^d	.930	.353	.051	.800	1.251	.619
Manner of Processing	-.039 ^d	-.781	.436	-.042	.974	1.026	.657
Ways of Deciding	.056 ^d	1.133	.258	.062	.965	1.036	.658

Note. ^aPredictors: (Constant), Highest Degree Earned; ^bPredictors: (Constant), Highest Degree Earned, OC – Orientation to Change; ^cPredictors: (Constant), Highest Degree Earned, OC – Orientation to Change, Gender (1 for male; 2 for female); ^dPredictors: (Constant), Highest Degree Earned, OC – Orientation to Change, Gender (1 for male; 2 for female), Certification Status (1 for non-092; 2 for 092).

Results – transactional leadership. A stepwise multiple linear regression procedure was conducted with the MLQ transactional leadership subscale as the criterion variable and the dimensions of problem solving style (*OC*, *MP*, and *WD*), gender, years of teaching experience, highest degree earned, and type of certificate as the predictor variables. None of the predictor variables entered the regression equation at the .0125 significance level.

Prior to running the stepwise multiple linear regression, multivariate outliers were identified and removed from the sample, yielding 345 cases for statistical regression analysis. The assumptions of multicollinearity, normality, linearity, and homoscedasticity also were verified prior to analyzing the data for the statistical regression on transactional leadership. Pearson *r* correlations among the seven predictors were examined. All these variables were correlated, but none of the correlations were high enough to consider the option of deleting a predictor variable. Refer to Table 37 for the values of these correlations.

Table 37

Intercorrelations for the Transactional Subscale and Predictor Variables and (n = 345)

	1	2	3	4	5	6	7
Criterion Variables							
Transactional	.032	.030	.114*	-.018	-.069	-.022	-.006
Predictor Variables							
1. Orientation to Change		-.031	.071	.101	-.141**	-.065	-.095
2. Manner of Processing			.083	-.144**	.052	-.050	-.052
3. Ways of Deciding				-.158**	-.097	.004	.006
4. Gender					.007	.015	-.101
5. Years of Experience						.406**	.353**
6. Highest Degree Earned							.560**
7. Type of Certificate							

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Tables 38 through 41 were used for data analysis: (a) the ANOVA results, (b) the model summary for transactional leadership as the criterion, (c) the coefficients of the prediction model, and (d) the excluded variables from the model.

The results of the ANOVA in Table 38 points out that Ways of Deciding: Person-Task was a significant predictor of transactional leadership scores, $R^2 = .013$, adjusted $R^2 = .010$, $F(1, 341) = 4.52$, $p < .05$. Ways of Deciding explained 1.0% of the variation in transactional leadership scores, $f^2 = .01$, small. The model summary in Table 39 shows that one predictor variable entered the regression equation in one step to predict the scores of transactional leadership. The computer selected Ways of Deciding to enter the model based on its correlation with the criterion variable. Once it entered the model, a change in the squared multiple correlation $\Delta R^2 = .013$ occurs. R^2 is the coefficient of multiple determination, and it depicts the amount of variation of the criterion variable that can be explained by the selected predictor variable (Meyers et al., 2006).

Although the SPSS results indicated that Ways of Deciding: Person-Task was a significant ($p < .05$) predictor of transactional leadership scores, Ways of Deciding was not a significant predictor at the Bonferroni adjusted alpha of .0125. Therefore, the non-directional hypothesis for Research Question Two that the dimensions of problem solving (*OC*, *MP*, and *WD*), gender, years of teaching experience, highest degree earned, and type of certificate significantly predicted the scores of educators' transactional leadership was rejected.

Table 38

Analysis of Variance Results for Transactional Leadership as the Criterion Variable

Model	<i>SSE</i>	<i>df</i>	<i>MSE</i>	<i>F</i>	Sig
1 Regression	1.05	1	1.05	4.52	.034 ^a
Residual	79.08	341	.23		
Total	80.13	342			

Note. ^aPredictors: (Constant), WD – Ways of Deciding.

Table 39

Model Summary for Transactional Leadership as the Criterion Variable

Model	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	<i>SE</i>	Change Statistics				
					ΔR^2	ΔF	<i>df</i> ₁	<i>df</i> ₂	Sig. ΔF
1	.114 ^a	.013	.010	.481	.013	4.520	1	341	.034

Note. ^aPredictors: (Constant), WD – Ways of Deciding.

Table 40

Stepwise Regression Analysis Predicting Transactional Leadership

Predictor Variables	<i>B</i>	<i>SE B</i>	<i>B</i>	<i>t</i>	Sig.	Collinearity Statistics	
						Tolerance	<i>VIF</i>
Model 1							
Constant	2.134	.114		18.791	.000		
Ways of Deciding	.007	.003	.114*	2.126	.034	1.000	1.000

Note. * $p < .05$.

Table 41

Excluded Variables from Stepwise Regression Analysis Predicting Transactional Leadership

Excluded Variables	<i>Beta</i> In	<i>t</i>	Sig.	Partial Correlations	Collinearity Statistics		
					Tolerance	<i>VIF</i>	Minimum Tolerance
Model 1							
Gender	.001	.018	.986	.001	.974	1.027	.974
Yrs of Experience	-.058	-1.066	.287	-.058	.990	1.011	.990
Highest Degree Earned	-.022	-.415	.678	-.023	1.000	1.000	1.000
Certification Status	-.007	-.123	.902	-.007	1.000	1.000	1.000
Orientation to Change	.023	.432	.666	.023	.995	1.005	.995
Manner of Processing	.021	.388	.698	.021	.994	1.006	.994

Note. ^aPredictors: (Constant), WD – Ways of Deciding; $p < .05$.

Results – passive/avoidant leadership. A stepwise multiple regression was conducted with MLQ passive/avoidant leadership subscale as the criterion variable and dimensions of problem solving style (*OC*, *MP*, and *WD*), gender, years of teaching experience, highest degree earned, and type of certificate as the predictor variables.

Prior to running the stepwise multiple linear regression, multivariate outliers were identified and removed from the sample, yielding 345 cases for statistical regression analysis. The assumptions of multicollinearity, normality, linearity, and homoscedasticity were verified prior to analyzing the data for the statistical regression on passive/avoidant leadership. The data were then analyzed. Pearson *r* correlations among the seven predictors were examined. All these variables were correlated, but none of the correlations were high enough to consider the option of deleting a predictor variable. Refer to Table 42 for the values of these correlations.

Table 42

Intercorrelations for the Passive/Avoidant Subscale and Predictor Variables and (n = 345)

	1	2	3	4	5	6	7
Criterion Variables							
Passive/Avoidant	.122*	.028	.029	-.085	-.127**	-.114*	-.220***
Predictor Variables							
1. Orientation to Change		-.031	.071	.101	-.141**	-.065	-.095
2. Manner of Processing			.083	-.144**	.052	-.050	-.052
3. Ways of Deciding				-.158**	-.097	.004	.006
4. Gender					.007	.015	-.101
5. Years of Experience						.406**	.353**
6. Highest Degree Earned							.560**
7. Type of Certificate							

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Refer to Tables 43 through 46 for data analysis: (a) the ANOVA results, (b) the model summary for passive/avoidant leadership as the criterion, (c) the coefficients of the prediction model, and (d) the excluded variables from the model.

The results of the ANOVA in Table 43 indicated that type of certificate was a significant predictor of passive/avoidant leadership scores, $R^2 = .049$, adjusted $R^2 = .046$, $F(1, 341) = 17.40$, $p < .001$. It explained 4.6% of the variation in passive/avoidant leadership scores, $f^2 = .05$, small.

The model summary in Table 44 shows that the predictor variables entered the regression equation in three steps to predict the scores of passive/avoidant leadership. In each step the computer selected a predictor variable to enter the model based on its correlation with the criterion variable. Once the variable enters the model, a change in the squared multiple correlation ΔR^2 occurs. R^2 is the coefficient of multiple determination (Meyers et al., 2006). It depicts the amount of variation of the criterion variable that can be explained by the combination of the predictor variables in the model. In the first step, the type of certificate entered the equation ($t = -4.172$, $p < .001$), yielding a change in the squared multiple correlation of $\Delta R^2 = .049$. In the second step of the regression, gender entered the equation ($t = -2.079$, $p < .05$), yielding an additional change in the squared multiple correlation of $\Delta R^2 = .012$. In the third step, *VIEW*'s Orientation to Change entered ($t = 2.113$, $p < .05$) yielding an additional change in the squared multiple correlation of $\Delta R^2 = .012$. However, the type of certificate was the only significant predictor at the Bonferroni adjusted alpha of .0125, and would be the only variable to be included. The two other variables, gender and OC, were removed from the equation because they were not significant predictors ($p > .0125$) of the scores of passive/avoidant leadership.

Table 43

Analysis of Variance Results for Passive/Avoidant Leadership as the Criterion Variable

Model	<i>SSE</i>	<i>df</i>	<i>MSE</i>	<i>F</i>	Sig.
1 Regression	4.89	1	4.89	17.40	.000 ^a
Residual	95.75	341	.28		
Total	100.64	342			
2 Regression	6.09	2	3.04	10.95	.000 ^b
Residual	94.55	340	.28		
Total	100.64	342			
3 Regression	7.32	3	2.44	8.86	.000 ^c
Residual	93.32	339	.28		
Total	100.64	342			

Note. ^aPredictors: (Constant), Certification Status (1 for non-092; 2 for 092); ^bPredictors: (Constant), Certification Status (1 for non-092; 2 for 092), Gender (1 for male; 2 for female); ^cPredictors: (Constant), Certification Status (1 for non-092; 2 for 092), Gender (1 for male; 2 for female), OC – Orientation to Change.

Table 44

Model Summary for Passive/Avoidant Leadership as the Criterion Variable

Model	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	<i>SE</i>	Change Statistics				
					ΔR^2	ΔF	<i>df</i> ₁	<i>df</i> ₂	Sig. ΔF
1	.220 ^a	.049	.046	.530	.049	17.40	1	341	.000
2	.246 ^b	.061	.055	.527	.012	4.32	1	340	.038
3	.270 ^c	.073	.065	.525	.012	4.47	1	339	.035

Note. ^aPredictors: (Constant), Certification Status (1 for non-092; 2 for 092); ^bPredictors: (Constant), Certification Status (1 for non-092; 2 for 092), Gender (1 for male; 2 for female); ^cPredictors: (Constant), Certification Status (1 for non-092; 2 for 092), Gender (1 for male; 2 for female), OC – Orientation to Change.

Table 45 shows the coefficients of the stepwise regression model that predicts the scores for passive/avoidant leadership. The coefficients of significant ($p < .0125$) predictors were used. The prediction equation is

$$\text{Predicted passive/avoidant leadership score} = 1.282 - .312 \times \text{Type of Certificate.}$$

Based on these results, it appears that educators who received the training to qualify for an administrative certificate tended to demonstrate less passive/avoidant leadership behaviors. Table 46 displays four predictor variables (years of experience, highest degree earned, MP, and WD) that the computer excluded from the model. A total of six variables were excluded from the model because they were not significant.

Therefore, the non-directional hypothesis for Research Question Two that the dimensions of problem solving (*OC*, *MP*, and *WD*), gender, years of teaching experience, highest degree earned, and type of certificate significantly predicted the scores of educators' passive/avoidant leadership was partially accepted.

Table 45

Stepwise Regression Analysis Predicting Passive/Avoidant Leadership

Predictor Variables	<i>B</i>	<i>SE B</i>	β	<i>t</i>	Sig.	Collinearity Statistics	
						Tolerance	<i>VIF</i>
Model 1							
Constant	1.282	.093		13.836	.000		
Certification Status	-.312	.075	-.220 ^{***}	-4.172	.000	1.000	1.000
Model 2							
Constant	1.532	.152		10.109	.000		
Certification Status	-.329	.075	-.232 ^{***}	-4.391	.000	.988	1.012
Gender	-.134	.064	-.110 [*]	-2.079	.038	.988	1.012

(continued)

Table 45

Stepwise Regression Analysis Predicting Passive/Avoidant Leadership

Predictor Variables	<i>B</i>	<i>SE B</i>	β	<i>t</i>	Sig.	Collinearity Statistics	
						Tolerance	<i>VIF</i>
Model 3							
Constant	1.249	.202		6.186	.000		
Certification Status	-.314	.075	-.222 ^{***}	-4.198	.000	.980	1.020
Gender	-.146	.064	-.120 [*]	-2.278	.023	.980	1.021
Orientation to Change	.004	.002	.112 [*]	2.113	.035	.981	1.020

Note. ^{*}*p* < .05, ^{**}*p* < .01, ^{***}*p* < .001.

Table 46

Excluded Variables from Stepwise Regression Analysis Predicting Passive/Avoidant Leadership

Excluded Variables	<i>Beta</i> In	<i>t</i>	Sig.	Partial Correlations	Collinearity Statistics		
					Tolerance	<i>VIF</i>	Minimum Tolerance
Model 1							
Gender	-.110 ^a	-2.079	.038	-.112	.988	1.012	.988
Yrs of Experience	-.056 ^a	-.997	.319	-.054	.876	1.141	.876
Highest Degree Earned	.018 ^a	.284	.777	.015	.673	1.486	.673
Orientation to Change	.100 ^a	1.897	.059	.102	.989	1.011	.989
Manner of Processing	.018 ^a	.332	.740	.018	.998	1.002	.998
Ways of Deciding	.031 ^a	.578	.564	.031	1.000	1.000	1.000

(continued)

Table 46

Excluded Variables from Stepwise Regression Analysis Predicting Passive/Avoidant Leadership

Excluded Variables	Beta In	t	Sig.	Partial Correlations	Collinearity Statistics		
					Tolerance	VIF	Minimum Tolerance
Model 2							
Yrs of Experience	-.052 ^b	-.920	.358	-.050	.875	1.143	.865
Highest Degree Earned	.029 ^b	.452	.652	.025	.669	1.495	.661
Orientation to Change	.112 ^b	2.113	.035	.114	.981	1.020	.980
Manner of Processing	.001 ^b	.019	.985	.001	.975	1.026	.966
Ways of Deciding	.013 ^b	.248	.804	.013	.974	1.027	.963

(continued)

Table 46

Excluded Variables from Stepwise Regression Analysis Predicting Passive/Avoidant Leadership

Excluded Variables	Beta In	t	Sig.	Partial Correlations	Collinearity Statistics		
					Tolerance	VIF	Minimum Tolerance
Model 3							
Yrs of Experience	-.039 ^c	-.684	.495	-.037	.863	1.159	.863
Highest Degree Earned	.031 ^c	.486	.627	.026	.669	1.496	.658
Manner of Processing	.003 ^c	.053	.958	.003	.975	1.026	.958
Ways of Deciding	.003 ^c	.056	.955	.003	.966	1.036	.952

Note. ^aPredictors: (Constant), Certification Status (1 for non-092; 2 for 092); ^bPredictors: (Constant), Certification Status (1 for non-092; 2 for 092), Gender (1 for male; 2 for female); ^cPredictors: (Constant), Certification Status (1 for non-092; 2 for 092), Gender (1 for male; 2 for female), OC – Orientation to Change.

Qualitative Data Analysis and Findings for Research Question Three

Research Question Three examined educators' perceptions of their leadership and problem solving. Participants were asked to respond to three free-response questions. The first question focused on the characteristics of an instructional leader. The second question addressed the characteristics of a teacher leader. The third question referred to the characteristics of a problem solver. The purpose of these open-ended responses was to triangulate the participants' perceptions of leaders and problem solvers with the data collected from the quantitative analysis of Research Questions One and Two. This section of Chapter Four is organized into the procedures used for the qualitative data analysis: (a) qualitative data collection and entry, (b) coding of data, (c) emerging patterns and themes, (d) confirmability audit, and (e) results.

Qualitative Data Collection and Entry

The participants in the study were invited to respond to these questions in writing at the time they completed the MLQ and *VIEW* questionnaires during the researcher's visit to their schools. The qualitative data were gathered in two waves from five distinct educational systems over a period of three years to explore the perspectives of a diverse group of educators about leadership and problem solving. The unit of analysis in this study is the collection of all participants to best understand leadership and problem solving in K-12 educational settings. The purpose of this general qualitative design was to describe the leadership and problem solving characteristics of K-12 educators from the participants' points of view.

The researcher designed a spreadsheet to organize the participants' ($n = 368$) responses to the three questions. The data were entered into a cell based on meaningful segments (Saldaña, 2013). Initially, many responses were repetitive, meaning that the data

were saturated (Glaser & Strauss, 1967). Redundant points of view are shared values, beliefs, or norms, and these were captured in phrases that the subjects used (Bogden & Biklen, 2007). While the frequency of the responses did not add value to the qualitative study; it was the quality of the information that was important (Merriam, 1988). Most responses described what a good leader or an effective leader should be as if the informants had assumed that some leaders were not good or effective. Very few responses (0.19%) described instructional leaders as being bossy and not approachable. Few other responses explained that problem solvers lacked positive characteristics (1.2%) or were limited by resources (1.3%). The responses varied among the participants based on their experiences. They related educators' leadership characteristics and problem solving to multiple realities including educational roles and positions, social roles, dispositions, and relationships with others.

The diverse and unstructured formats of the responses were partly due to how the researcher worded the questions (Merriam, 1988), and somewhat because the participants had diverse backgrounds and had possibly different meanings of what characterized an instructional leader, a teacher leader, or a problem solver. Because of the limited interaction between the researcher and the participants during the survey administration, it was the researcher's intention to pose the questions in an open format to encourage participants' sharing of varied perceptions. The researcher presupposed that the participating educators had something to contribute, an experience worth describing, or an opinion to share (Merriam, 1988) about leadership and problem solving. While the MLQ and *VIEW* instruments were used to assess these educators' leadership characteristics and preferences for problem solving, data gathered from the free responses were insightful about the

educators' perceptions of leadership and problem solving. The researcher expected to maximize perceptions (Stake, 1995b) by the participating staff from multiple sites for a better representation of educators holding positions in urban, suburban, and rural areas. All responses were considered for the qualitative data analysis.

The responses varied in length and in format. They were single words listed in an outline format. They were phrases, sentences, and paragraphs. The free format and structure of the responses and the numerous key words and phrases that the subjects used to describe the characteristics of leaders and problem solvers motivated the researcher to split the data into meaningful clusters of words or phrases upon entry in the spreadsheet.

Coding of Data

Exact words of the free responses to the three questions for each participant were entered in a spreadsheet. They were coded using open coding, axial coding, and selective coding (Saldaña, 2013).

Open coding. Open coding or initial coding is a first cycle method that is appropriate for almost all qualitative studies (Saldaña, 2013). It splits “the data into individually coded segments” (Saldaña, 2013, p. 51), and provides the researcher with direction as to how to proceed. The open codes are subject to change and “may be reworded as analysis progresses” (Saldaña, 2013, p. 101). At the start, 1,576 codes for the responses about an instructional leader, 1,289 codes for the responses about a teacher leader, and 1,200 codes for the responses about a problem solver were used. The researcher used the exact words that the participants intended to emphasize in their responses. Her goal was to avoid bias when analyzing the data. She coded the responses with unclear information as N/A and the unanswered questions as zero to be able to identify the missing information. The researcher

was uncertain about 24 responses on the characteristics of an instructional leader, 34 responses on the characteristics of a teacher leader, and 53 responses on the characteristics of a problem solver. She found 3 unanswered questions about the instructional leader, 7 about the teacher leader, and 6 blank responses about the problem solver.

Table 47 provides a summary of the types and numbers of responses that the researcher coded for each of the three free-response questions.

Table 47

Summary of the Types and Numbers of the Participants' Responses

Free-Response Question	Responses				
	Used	Unused	Unclear	Blank	Total
Instructional leader	1,546	3	24	3	1,576
Teacher leader	1,248	0	34	7	1,289
Problem solver	1,112	29	53	6	1,200
Total	3,906	32	111	16	4,065

Note. Used – Responses included in the analysis; Unused – Responses coded but not included because they were not part of a dominant subcategory; Unclear – Responses that were not clear to the researcher; Blank – No response.

Many of the coded responses were basically the same, but they were worded differently in the participants' responses such as take risk, takes risk, risk-taker, risk taker, and risk taking. Recoding was necessary to eliminate repetitive same codes, and in some cases, it led to new ideas (Miles & Huberman, 1994). Analyzing the data using SPSS identified 274, 200, and 241 distinct open codes for the three free-response questions, respectively. Some of these codes were clustered based on their interpretations, and so the

final numbers of open codes were 34 for the instructional leader, 33 for the teacher leader, and 33 for the problem solver.

Table 48 displays the subcategories representing these open codes for each of the three open-ended questions. These subcategories were ranked in descending order of their frequencies for each question. The purpose was to better analyze the dominant subcategories and describe the characteristics of instructional leaders, teacher leaders, and problem solvers as perceived by the respondents.

Table 48

Frequencies of Subcategories in Descending Order

Instructional Leader		Teacher Leader		Problem Solver	
Subcategory	Frequency	Subcategory	Frequency	Subcategory	Frequency
Having interpersonal skills	133	Showing empathy	102	Collaborating	102
Developing others	96	Developing others	91	Creative thinking	100
Knowledge of curriculum					
and standards	74	Having interpersonal skills	82	Making informed decisions	94
Establishing goals	73	Collaborating	77	Having interpersonal skills	93
Focus on teaching and					
learning	72	Leading by example	64	Critical thinking	91
Influential	63	Being positive	59	Flexible/adapting	72
Experienced	63	Establishing goals	51	Creative	63
		Focus on teaching and			
Collaborating	62	learning	51	Self-confident	54

(continued)

Table 48

Frequencies of Subcategories in Descending Order

Instructional Leader		Teacher Leader		Problem Solver	
Subcategory	Frequency	Subcategory	Frequency	Subcategory	Frequency
Self-control	59	Self-control	49	Solving problems	54
		Knowledge of curriculum			
Leading by example	59	and standards	47	Transparent	41
Self-confident	58	Wholeheartedness	43	Establishing goals	36
Transparent	56	Flexible/adapting	40	Self-control	36
Showing empathy	56	Creative	39	Reflective	29
Creative	52	Desire to grow	34	Being positive	27
Wholeheartedness	46	Self-confident	31	Showing empathy	26
Flexible/adapting	44	Influential	25	Developing others	25
Making informed decisions	44	Experienced	25	Wholeheartedness	19

(continued)

Table 48

Frequencies of Subcategories in Descending Order

Instructional Leader		Teacher Leader		Problem Solver	
Subcategory	Frequency	Subcategory	Frequency	Subcategory	Frequency
		Knowledge of theories of			
Creative thinking	42	teaching and learning	25	Developing plans	16
Being positive	42	Transparent	24	Experienced	15
Solving problems	41	Creative thinking	24	Respect/trust	14
Teamwork	41	Respect/trust	24	Expected outcomes	13
Respect/trust	41	Solving problems	23	Resources	12
Desire to grow	34	Teamwork	23	Teamwork	11
Critical thinking	30	Formal position	20	Leading by example	9
Knowledge of research and				Focus on teaching and	
current trends	26	Critical thinking	18	learning	9

(continued)

Table 48

Frequencies of Subcategories in Descending Order

Instructional Leader		Teacher Leader		Problem Solver	
Subcategory	Frequency	Subcategory	Frequency	Subcategory	Frequency
Knowledge of theories of					
teaching and learning	26	Having teaching experience	18	Desire to grow	9
Expected outcomes	21	Expected outcomes	17	Knowledge of stakeholders	6
Reflective	20	Reflective	16	Formal position	5
Resources	14	Making informed decisions	9	Knowledge of research and	4
				current trends	
Knowledge of stakeholders	12	Resources	7	Knowledge of curriculum	3
				and standards	
Formal position	12	Knowledge of stakeholders	7	Influential	3
Having teaching experience	11	Knowledge of research and current trends	6	Knowledge of theories of	2
				teaching and learning	

(continued)

Table 48

Frequencies of Subcategories in Descending Order

Instructional Leader		Teacher Leader		Problem Solver	
Subcategory	Frequency	Subcategory	Frequency	Subcategory	Frequency
Developing plans	6	Developing plans	4	Having teaching experience	
Having personal skills	2	Having personal skills		Having personal skills	
Total	1,531	Total	1,175	Total	1,093

Analysis of codes related to the characteristics of instructional leaders and teacher leaders. Instructional leaders are knowledgeable of the core of the school, the district, and the stakeholders. They understand individual differences, and have a wealth of knowledge of learning, motivation, and teaching. They are educated, experts in their subjects, and up-to-date on state initiatives and current trends in education. Their honesty, fairness and firmness help them develop relationships with others based on mutual respect and trust, openness, and collaboration. They set high expectations not only for others, but for themselves as well. They are critical and creative thinkers, who challenge the status quo and continuously seek personal growth, growth of others, and improvements in instruction, teaching, and learning. They often seek input from others, and so their decisions are well-informed and are driven by evidence and research. They are flexible and open-minded. As a result, they accept feedback, model values and best practices, and grow as reflective life-long learners. They are inspiring and they lead others by example. They enable others to grow by providing or sharing resources, supporting them to meet their individual needs, encouraging them to be creative, providing them with meaningful and constructive feedback, and engaging them in problem solving and decision making. The data showed similar characteristics for the questions about teacher leaders and instructional leaders. The data also showed that both types of leaders would use the same group process to achieve goals.

The participants' responses further indicated that the role of an instructional leader is not limited to an administrator; other educators including teacher leaders are instructional leaders as well. Approximately .5% of the participants identified administrators as instructional leaders, and 15.5% of the participants perceived teacher leaders as instructional

leaders. About 1.09% of the responses described teacher leaders as department heads and 3.0% identified them as classroom teachers.

Analysis of codes related to the characteristics of a problem solver. Educators, in general, are problem solvers. They are creative and critical thinkers. They work collaboratively, and seek information and help from each other as they attempt to find and solve problems. They analyze data, generate ideas, evaluate solutions, and develop plans. They are good listeners and communicators. They are reflective thinkers who continuously seek the good for all. Their efforts to continuously improve build on their knowledge, experience, motivation, dialogue, and interaction with others. They are open-minded and risk takers. They experiment with different approaches in order to improve teaching and learning. Approximately 5.2% of the participants described problem solvers as administrators, non-administrators, or all educators.

Axial coding. Axial coding is a second cycle process that uses gerunds to imply an activity such as teaching and evaluating, or a conceptual action such as adapting and negotiating (Saldaña, 2013). It helps sort the open codes, regroup them, and label the newly created groups or sub-categories into conceptual categories. It describes the properties and dimensions of categories, “and explores how the categories and subcategories relate to each other” (Saldaña, 2013, p. 209). For example, some of the open codes describing communication appeared to represent different behaviors and therefore they would be part of different categories. The open codes such as communicating, communicating-clearly, communicating-well, communicating-families, communicating-ideas, communicating-stakeholders, communicating-staff and students, and communicating-skills combined became part of the larger concept communicating. The open code related to communicating vision

was part of a broader concept related to the school vision and direction. The researcher identified 22 axial codes describing the characteristics of an instructional leader, 21 axial codes for a teacher leader, and 22 axial codes for a problem solver. Appendix H provides a code book listing the open codes and the axial codes. The researcher reviewed the open codes and the axial codes three times: (a) initial coding, (b) recoding upon discussion of codes with the qualitative auditor, and (c) recoding upon feedback from the auditor. Few open codes were reworded or clustered based on the researcher's interpretation of the response. Table 49 presents 19 categories from the axial codes, the corresponding final list of open codes (subcategories) and their frequencies for each of the three questions related to the characteristics of instructional leaders, teacher leaders, and problem solvers. The researcher found these subcategories to be dominant (Saldaña, 2013) when the code recurred at least 10 times in the participants' responses to a specific question. This means that these subcategories would be part of recurring patterns and themes. It also means that at least 2.7% of the participants perceived this subcategory as an important characteristic of a leader or a problem solver.

Table 49

Categories and Sub-categories for Characteristics of an Instructional Leader, a Teacher Leader, and a Problem Solver (n = 368)

Category Number	Categories	Sub-Categories	Instructional Leader ¹	Teacher Leader ²	Problem Solver ³
1	Assuming authority	Formal position	12	20	5
		Resources	14	7	12
2	Building teams	Collaborating	62	77	102
		Teamwork	41	23	11
3	Building trust	Respect/trust	41	24	14
4	Cognitive ability	Critical thinking	30	18	91
		Solving problems	41	23	54
5	Creative person	Creative	52	39	63
		Creative thinking	42	24	100
		Flexible/adapting	44	40	72
6	Decision making	Making informed decisions	44	9	94

(continued)

Table 49

Categories and Sub-categories for Characteristics of an Instructional Leader, a Teacher Leader, and a Problem Solver (n = 368)

Category Number	Categories	Sub-Categories	Instructional Leader ¹	Teacher Leader ²	Problem Solver ³
7	Emotional stability	Self-confident	58	31	54
		Self-control	59	49	36
8	Establishing goals and developing plans	Developing plans	6	4	16
		Establishing goals	73	51	36
9	Ethics and integrity	Transparent	56	24	41
10	Knowledge of curriculum and standards	Knowledge of curriculum and standards	74	47	3
11	Knowledge of research and current trends	Knowledge of research and current trends	26	6	4
12	Knowledge of stakeholders	Knowledge of stakeholders	12	7	6

(continued)

Table 49

Categories and Sub-categories for Characteristics of an Instructional Leader, a Teacher Leader, and a Problem Solver (n = 368)

Category Number	Categories	Sub-Categories	Instructional Leader ¹	Teacher Leader ²	Problem Solver ³
13	Knowledge of theories of teaching and learning	Knowledge of theories of teaching and learning	26	25	2
14	Modeling	Leading by example	59	64	9
15	People-centered behavior	Developing others	96	91	25
		Having interpersonal skills	133	82	93
		Having personal skills	2		
		Influential	63	25	3
		Showing empathy	56	102	26
16	Positive characteristics	Being positive	42	59	27

(continued)

Table 49

Categories and Sub-categories for Characteristics of an Instructional Leader, a Teacher Leader, and a Problem Solver (n = 368)

Category			Instructional	Teacher	Problem
Number	Categories	Sub-Categories	Leader ¹	Leader ²	Solver ³
17	Self-motivated	Desire to grow	34	34	9
		Reflective	20	16	29
		Wholeheartedness	46	43	19
18	Setting expected outcomes	Expected outcomes	21	17	13
19	Teaching experience	Experienced	63	25	15
		Focus on teaching and learning	72	51	9
		Having teaching experience	11	18	
		Total	1,531	1,175	1,093

Note. ^{1,2,3}Frequencies of subcategories.

The researcher identified the meaningful and most frequently occurring categories as the dominant categories. Table 50 lists the dominant categories and their frequencies for the instructional leader, the teacher leader, and the problem solver. In general, the frequencies of these categories for an instructional leader were higher than those for a teacher leader. The problem solver ranked the highest on flexibility, cognitive ability, being creative, building teams, and decision making, and the lowest on people-centered behavior. Educators perceived the problem solver as a creative and critical thinker, and a team builder. It is intriguing that the problem solver was seen as low on being people-centered, yet high on being a team builder. One interpretation would be that the problem solver focuses on the task to be completed and seeks a feasible solution, yet he or she may challenge others to complete the task. As a result, the problem solver uses group process strategies to build teams in order to achieve the desired goals. The participants also perceived leaders as self-motivated, experienced, knowledgeable, and team builders.

Table 50

Dominant Categories and Their Frequencies (n = 368)

Category Number	Categories	Instructional Leader	Teacher Leader	Problem Solver
1	Assuming authority	26	27	17
2	Building teams	103	100	113
3	Building trust	41	24	14
4	Cognitive ability	71	41	145
5	Creative person	138	103	235
6	Decision making	44	9	94
7	Emotional stability	117	80	90
8	Establishing goals and developing plans	79	55	52
9	Ethics and integrity	56	24	41
10	Knowledge of curriculum and standards	74	47	3
11	Knowledge of research and current trends	26	6	4
12	Knowledge of stakeholders	12	7	6
13	Knowledge of theories of teaching and learning	26	25	2

(continued)

Table 50

Dominant Categories and Their Frequencies (n = 368)

Category		Instructional	Teacher	Problem
Number	Categories	Leader	Leader	Solver
14	Modeling	59	64	9
15	People-centered behavior	350	300	147
16	Positive characteristics	42	59	27
17	Self-motivation	100	93	57
18	Setting expected outcomes	21	17	13
19	Teaching experience	146	94	24
	Total	1,531	1,175	1,093

Selective coding. Selective coding or theoretical coding is a second cycle process that helps the researcher organize the conceptual categories into patterns and themes that become the components of the research study and report (Saldaña, 2013). The purpose is to find the central or core category which encompasses all the categories and subcategories derived throughout the analysis (Saldaña, 2013). At this stage, the data become theory (Stauss & Corbin, 1998). The findings are presented as interrelated concepts that evolved over time as the researcher interacted with the data. Upon a continuous review of the categories and subcategories and constant reflection on the codes, their meanings, and their relationships in an educational setting, the researcher sought to integrate and refine the categories. Prior to identifying the emerging patterns, non-dominant categories were counted into similar dominant categories. For example, monitoring and evaluating occurred twice as

a characteristic of an instructional leader and once as a characteristic of a teacher leader. It was included in decision making category. Classroom management also appeared twice in the responses describing an instructional leader, and was combined with focus on teaching and learning. The researcher excluded the frequencies related to the perceived educator's role, the limitations suggested in the responses, and the negative characteristics, because they were deemed irrelevant to the purpose of this study. The analyses yielded four common overarching themes related to: (a) personal characteristics, (b) interactions with others, (c) knowledge and experience, and (d) setting direction. Table 51 lists the four themes, categories, and percentages of occurrence in the participants' responses. The most frequently recurring themes were personal characteristics (39.98%) and interactions with others (35.25%). There was less emphasis in the participants' responses on knowledge and experience (13.21%) and setting direction (10.21%).

Table 51

Emerging Patterns and Themes, Related Categories, and Percentages

Patterns and Themes	Categories	%
Personal characteristics	Creative person	12.53
	Emotional stability	7.55
	Cognitive ability	6.76
	Self-motivation	6.58
	Positive characteristics	3.37
	Ethics and integrity	3.19
Total		39.98
Interactions with others	People-centered behavior	20.98
	Building teams	8.32
	Decision making	3.87
	Building trust	2.08
Total		35.25
Knowledge and experience	Teaching experience	6.95
	Knowledge of curriculum and standards	3.26
	Knowledge of theories of teaching and learning	1.4
	Knowledge of research and current trends	0.95
	Knowledge of stakeholders	0.66
Total		13.21

(continued)

Table 51

Emerging Patterns and Themes, Related Categories, and Percentages

Patterns and Themes	Categories	%
Setting direction	Establishing goals and developing plans	4.21
	Modeling	3.47
	Assuming authority	1.84
	Setting expected outcomes	1.34
Total		10.21

Figure 12 displays the emerging patterns and themes. The numbers in parentheses refer to the frequencies of the assigned codes in the participants' responses to the three open-ended questions.

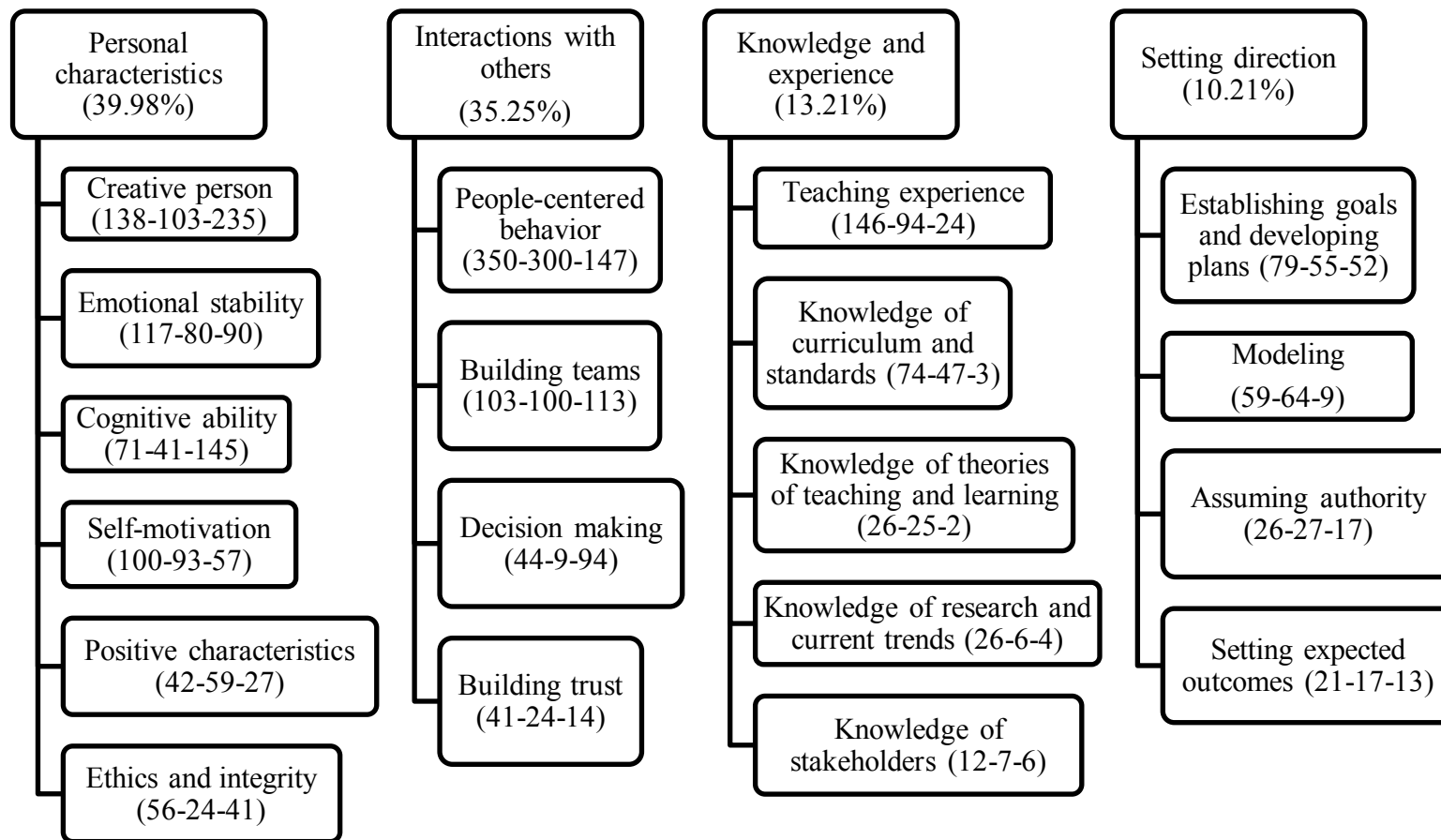


Figure 12. Emerging Patterns and Themes (Frequencies: instructional leader – teacher leader – problem solver)

Emerging Patterns and Themes

Four themes emerged from the aggregate participants' responses to the three open-ended questions related to their perceptions of the characteristics of an instructional leader, a teacher leader, and a problem solver. Refer to Figure 13 for the themes that emerged from the 19 categories.

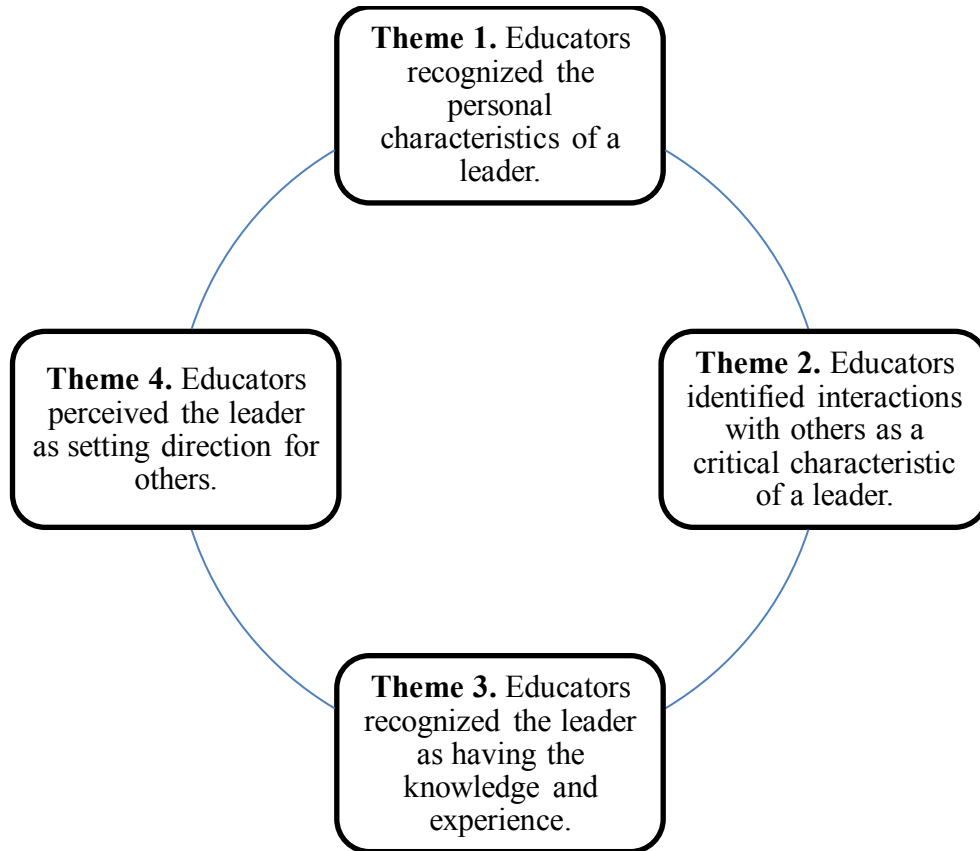


Figure 13. The Four Themes

Theme 1: Personal characteristics. The first theme, personal characteristics, emerged from six categories: (a) creative person, (b) emotional stability, (c) cognitive stability, (d) self-motivation, (e) positive characteristics, and (f) ethics and integrity.

The participants described an instructional leader as a creative person by being “creative in finding solutions” (195) and by being “flexible” (31). The respondents perceived a teacher leader as “someone who thinks *out of the box*” (191), and “utilizes ideas observed

in other classrooms - adapted to specific content areas” (25). They described a problem solver as “unique (many solutions to few problems)” (195) and flexible when “problems [will] arise” (26).

Examples of emotional stability include “instructional leaders are confident and persuasive” (5). They are recognized for their “objectivity” (10). Teacher leaders are “outgoing” (6) and “organized” (11). A participant described a problem solver as “instructional leaders [who] feel confident with making choices that will [impact] a large group of students” (7), and “remain calm in the situation” (11).

The respondents recognized that “an instructional leader should have the courage to ask questions about the real causes of the problems that educators face today” (317). They commented that “teacher leaders are smart” (102) and have the “ability to solve problems” (106). They described “a problem solver [as] someone who thinks critically about a situation” (12) and is “willing to ask questions” (106).

The participants also recognized leaders for self-motivation. They described an instructional leader as “lifelong learner” (62), “hard working” (46), “always looking for new ideas/tools/methods” (49), “who learn new ideas in instruction” (53), and “who seek out opportunities” (66). They perceived a teacher leader as “thoughtful” (56), cognizant of “the importance of hard work” (46), who “exemplifies the enthusiasm” (47) and “desire to continue their own education” (292), and who “self-selects herself as a leader” (323) for self-improvement. The responses also indicated that a problem solver does not “give up or say it is too difficult a problem” (66).

Most of the responses praised leaders for being “positive” (73) or having a “positive attitude” (83). They further described an instructional leader as being “fair, consistent,

compassionate” (67), and accounts “for all the materials/equipment used in their course” (71). The “best problem solvers” are seen as “honest and deliberate” (66).

Theme 2: Interactions with others. The second theme, interactions with others, was derived from four categories: (a) people-centered behavior, (b) building teams, (c) decision making, and (d) building trust.

In the people-centered behavior category, the respondents stated that “an instructional leader's primary function is to support teachers with the aim of providing high quality effective education” (318), and “may mentor teachers within their district” (301). He or she has “personal skills” (316), “visits classrooms” (276), “understands individuals, and gets others encouraged” (314), and motivated. The participants described a teacher leader as “caring” (276), “able to teach peers, active in PLC, PD” (277), “the go-to person” (314), and “mentor to other staff” (276). However, they described a problem solver as “articulate” (314) and a “good listener” (301).

For building teams, the responses described an instructional leader as a “team player” (20) who “shares knowledge with their colleagues [...] to improve student achievement” (3391). They indicated that a teacher leader is an individual who “works well with team mates” (301) using a “collaborative approach” (4). However, a problem-solver was portrayed as an individual who “can facilitate collaboration among stakeholders” (300), and is “willing to see all points of view” (10).

In the decision making category, the participants depicted an instructional leader to “take an active role in making decisions about curriculum” (145), and is a “good decision maker” (16). A problem solver knows “where the decision is theirs to make and where consensus is best route” (8), and would “consult others to be well informed” (142).

Building trust was a category that was derived from the participants' description of an instructional leader who "can instill a sense of trust in staff" (273) and is "well respected by staff" (319). It also was implied in other responses. For instance, a teacher leader is "being trusted" by teachers (272) because of mutual respect and trust. A problem solver would "consult others and collaborate to make decisions" (5), and would "delegate to someone with a complimentary skill" (273).

Theme 3: Knowledge and experience. The third theme, knowledge and experience, subsumed five categories: (a) teaching experience, (b) knowledge of curriculum and standards, (c) knowledge of theories of teaching and learning, (d) knowledge of research and current trends, and (f) knowledge of stake holders.

The different categories that contributed to the third theme were self-explanatory and did not require much interpretation. For example, "an instructional leader is a person who has a strong background in pedagogy" (316), "who has expertise and knowledge in their field of expertise" (300) and "stays current of research" (300). He or she "is often sought out by others" (301), "possesses an in-depth background in teaching/learning process and an expert background in curriculum development" (277). Nevertheless, a teacher leader is "seen as an 'expert' by her peers" (277). A problem solver "is a 'go to' person (289) and is "aware of participants' bias/emotional reaction" (278).

Theme 4: Setting direction for others. The fourth theme, setting direction for others, stemmed from four categories: (a) establishing goals and developing plans, (b) modeling, (c) assuming authority, and (d) setting expected outcomes.

For establishing goals and developing plans, the responses focused on the instructional leader's role to set "the tone for the building in terms of the latest best practices

for teaching and learning” (275). On the other hand, a teacher leader “willingly takes a leader role in developing new curriculum or advancing new initiatives” (277), and “takes the lead in piloting programs, promoting new ways of delivering instruction, assessing effectiveness of pilot programs” (279). A problem solver “develops and communicates a vision for solution of problem” (279).

In the modeling category, the participants indicated professionalism (39) and setting “a positive example for others through their actions” as common characteristics for both an instructional leader and a teacher leader.

The respondents implied the assuming authority category by describing the instructional leader as “a liaison between the school and the rest of the district, and the public” (313), a teacher leader as “a liaison between teachers and administrators” (15), and a problem solver as “having many resources” (100).

On the category of setting expected outcomes, the participants anticipated that a leader or a problem solver has “high expectations” (217), is “effective [and] efficient” (195), and follows through (194).

Although the four themes were derived from the 19 categories based on their meanings and relationships, they are interdependent, and together they contribute to the characteristics of a leader or a problem solver. For instance, personal characteristics became a central category because it focused on the individual characteristics that were unique to the leader or to the problem solver. Knowledge and experience emerged as a core category in this study. Knowledge of content, curriculum, standards, pedagogy, and theories of teaching and learning is a requirement to become an educator. With teaching experience, professional learning, and staying current with research and trends in education, the individual develops

leadership behavior and acquires diverse tools to problem solving over time. Individual growth requires a nurturing environment that supports that growth. Through mutual trust and respect, collaboration, shared knowledge, and building relationships with the stakeholders, the individual who develops others becomes influential and demonstrates leadership behavior. Through his or her support to others, he or she develops others' capacities for leadership. This is how interactions with others evolved as an overarching theme. The last central category is setting direction through goal setting and modeling values, beliefs, and best practices. The expected outcome in a K-12 educational setting is to improve teaching and learning that take place at school, and specifically in the classroom.

Confirmability Audit

To enhance trustworthiness in this study, the researcher should establish confirmability. The findings should emerge from the data and not from her predispositions (Guba & Lincoln, 1981; Shenton, 2004). The derived categories and subcategories should be internally consistent but distinct (Marshall & Rossman, 1999). One of the strategies that the researcher used to prove confirmability was to ask a cohort graduate with a doctorate in instructional leadership to audit the data analysis and codes. The auditor had experience in conducting qualitative research and 20 years of experience in education. Her experience included teaching mathematics and serving in the school counseling department at the secondary level, and teaching college mathematics undergraduate courses. For the qualitative audit, the researcher sorted the data by the participant codes in ascending order and selected the responses of 10 participants from the start of the list, 10 participants from the middle, and 10 participants from the end of the data file. She included all responses of the three qualitative questions for each of the thirty participants. She provided the auditor

with a copy of Chapter One, the three research questions, the three qualitative open-ended questions, and the code list with definitions. The auditor initially examined the codes and gave feedback to the researcher on the coded responses to the first two free-response questions. They were in agreement on 89% on the axial codes and on 91% on the open codes. After the researcher made the agreed-upon changes, the auditor reviewed the codes for all three questions. The auditor and the researcher agreed on 92% on the axial codes and on 97% on the open codes. Refer to Appendix I for a copy of the confirmability audit report.

Results

The participants perceived leaders and problem solvers in various ways. They expressed their perceptions in terms of personal characteristics, interpersonal characteristics, aptitudes, practices, and behaviors. Based on the responses of the participants, four themes emerged. They were related to individual characteristics, knowledge and experience, interactions with others, and developing plans with a focus on teaching and learning. These themes were explored in more depth in the next section as the researcher triangulates the results of the quantitative data analyses for Research Questions One and Two with the results of the qualitative data analysis for Research Question Three.

Triangulation of Qualitative and Quantitative Data

Triangulation involves a comparison of different kinds of data such as quantitative and qualitative data, or comparing different methods such as surveys and free-response questions to determine the validity of the researcher's conclusion about the data (Silverman, 2006). In this study, the quantitative and the qualitative data were collected at the same time, validated, and interpreted using a convergent parallel model (Creswell, 2013). The results of the quantitative analyses of Research Questions One and Two were triangulated with the data gathered from the

participants' free responses. The focus was on the description of the participants' responses and on the researcher's reflection based on her experience and on the data (Stake, 1995b). Meaning is important (Stake, 1995b), and records and tables were used "for classification and pattern recognition" (Stake, 1995a, p. 445). Tables 52 and 53 show how the themes related to the quantitative results in the areas of transformational and passive/avoidant leadership. Transactional leadership was not considered for triangulation because the results of the quantitative analyses of Research Questions One and Two in this area were not significant.

Table 52

Triangulation of Quantitative and Qualitative Results in the Area of Transformational Leadership

Quantitative Results	Qualitative Theme	Relationship
<p>Research Question One. Well-defined Explorers ($M = 3.22, SD = .48$), moderate Explorers ($M = 3.22, SD = .40$), and moderate Developers ($M = 3.09, SD = .43$) scored significantly ($p < .05$) higher than those described as well-defined Developers ($M = 2.97, SD = .36$). Moderate Explorers ($M = 3.22, SD = .40$) also scored significantly ($p < .05$) higher than moderate Developers ($M = 3.09, SD = .43$).</p>	<p>Personal characteristics:</p> <ul style="list-style-type: none"> a. Creative person b. Emotional stability c. Cognitive ability d. Self-motivation 	<p>In order to promote transformational leaders, educators should increase their flexibility and seek innovative strategies to improve teaching and learning.</p>

(continued)

Table 52

Triangulation of Quantitative and Qualitative Results in the Area of Transformational Leadership

Quantitative Results	Qualitative Theme	Relationship
<p>Research Question One. Well-defined Externals ($M = 3.19, SD = .38$) and moderate Externals ($M = 3.14, SD = .41$) scored significantly ($p < .05$) higher than those described as well-defined Internals ($M = 3.01, SD = .48$). Moderate Externals ($M = 3.14, SD = .41$) scored significantly ($p < .05$) higher than those described as moderate Internals ($M = 3.07, SD = .43$).</p>	<p>Interactions with others:</p> <ul style="list-style-type: none"> a. People-centered behavior b. Building teams c. Decision making d. Building trust 	<p>Educators who prefer to seek information and input from other sources to make informed decisions are more transformational than those who initially work to solve complex problems on their own.</p>

(continued)

Table 52

Triangulation of Quantitative and Qualitative Results in the Area of Transformational Leadership

Quantitative Results	Qualitative Theme	Relationship
<p>Research Question Two. Highest degree earned ($r = .283, p < .0125$), Orientation to Change ($r = -.236, p < .0125$), gender ($r = .170, p < .0125$), and type of certificate ($r = .282, p < .0125$), were significant predictors of the variance in the mean scores of transformational leadership.</p>	<p>Personal characteristics Interactions with others Knowledge and experience Setting direction</p>	<p>Experienced educators who were motivated and pursued advanced degrees including an administrative certificate demonstrated behaviors that were transformational.</p>

Table 53

Triangulation of Quantitative and Qualitative Results in the Area of Passive/Avoidant Leadership

Quantitative Results	Qualitative Theme	Relationship
<p>Research Question One. Well-defined Developers ($M = 1.13, SD = .57$) scored significantly ($p < .05$) higher than those described as well-defined Explorers ($M = .91, SD = .52$), moderate Explorers ($M = .80, SD = .51$) and moderate Developers ($M = .89, SD = .55$).</p>	<p>Knowledge and experience:</p> <ul style="list-style-type: none"> a. Knowledge of curriculum and standards b. Knowledge of research and current trends c. Knowledge of theories of teaching and learning d. Teaching experience 	<p>Well-defined Developers may believe that others have the same knowledge and experience that they have in completing complex tasks and, therefore, might not need specific leadership.</p>

(continued)

Table 53

Triangulation of Quantitative and Qualitative Results in the Area of Passive/Avoidant Leadership

Quantitative Results	Qualitative Theme	Relationship
<p>Research Question One. Well-defined Externals ($M = .97, SD = .56$), moderate Internals ($M = 1.00, SD = .54$) and well-defined Internals ($M = .99, SD = .57$) scored significantly ($p < .05$) higher than the moderate Externals ($M = .79, SD = .52$).</p>	<p>Interactions with others:</p> <ul style="list-style-type: none"> a. People-centered behavior b. Building teams c. Decision making d. Building trust 	<p>Educators who are moderate Externals may be able to influence others.</p>

(continued)

Table 53

Triangulation of Quantitative and Qualitative Results in the Area of Passive/Avoidant Leadership

Quantitative Results	Qualitative Theme	Relationship
<p>Research Question Two. Type of certificate ($r = -.22, p < .0125$) was a significant predictor of passive/avoidant leadership scores.</p>	<p>Knowledge and experience:</p> <ul style="list-style-type: none"> a. Knowledge of curriculum and standards b. Knowledge of research and current trends c. Knowledge of theories of teaching and learning d. Teaching experience 	<p>Educators who met the requirements of administrative certificates were less passive/avoidant than those who did not.</p>

Chapter Summary

Chapter Four presented analyses of quantitative and qualitative data that were gathered by administering the MLQ (Bass & Avolio, 2004), *VIEW: An Assessment of Problem Solving Style* (Treffinger et al., 2007), and a researcher-created survey on demographics information and three free-response questions. The quantitative data analysis was used to explore K-12 educators' perceptions of their leadership styles based on their problem solving styles in two research questions. Research Question One employed a MANOVA to determine if there was a significant difference in scores on the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*) between educators based on their preferences for problem solving styles produced by the three *VIEW* dimensions (*OC*: E-e-d-D; *MP*: E-e-i-I; and *WD*: P-p-t-T). Results indicated that there were significant differences between the scores on the MLQ leadership subscales for the OC and the MP groups. The OC subgroups (*well-defined Explorer*, *moderate Explorer*, *moderate Developer*, *well-defined Developer*) differed in both areas of transformational leadership and passive/avoidant leadership. The MP subgroups (*well-defined External*, *moderate External*, *moderate Internal*, *well-defined Internal*) also differed in both areas of transformational leadership and passive/avoidant leadership.

Research Question Two focused on the extent to which the types of leadership produced by the MLQ (*transformational*, *transactional*, and *passive/avoidant*) each was predicted by the dimensions of problem solving style (*OC*, *MP*, and *WD*), gender, years of teaching experience, highest degree earned, and type of certificate. Based on the sample in this study, it was evident that the educators who had advanced degrees were identified as Explorers, met the requirements of an administrative certificate, and were more likely to have

higher scores on the MLQ transformational leadership subscale. Educators who received training to qualify for an administrative certificate had lower scores on the passive/avoidant leadership behaviors. Females in the sample tended to demonstrate more transformational behavior than males.

Research Question Three consisted of three free-response questions. They addressed the characteristics of an instructional leader, a teacher leader, and a problem solver as perceived by the participants in the study. The researcher coded the responses using open coding, axial coding, and selective coding (Saldaña, 2013), and then developed the patterns and themes from the qualitative data. Four overarching themes emerged: (a) personal characteristics, (b) interactions with others, (c) knowledge and experience, and (d) setting direction. The participants' responses indicated that the characteristics of an instructional leader were very similar to those of a teacher leader and to a problem solver. When involved in problem solving, educators used critical and creative thinking skills in their collaborative approaches to problem solving. They sought information and gathered data to make informed decisions. They seemed to be more reflective when solving problems than when engaged in other activities.

CHAPTER FIVE: SUMMARY AND CONCLUSIONS

Chapter Five contains six sections: (a) a summary of the study, (b) a review of the results, (c) a critique of the results in light of the current literature, (d) a description of the limitations of the study, (e) implications of the study, and (f) possible directions for future research.

Summary of the Study

The purpose of this study was to understand the characteristics of K-12 educators with respect to their leadership and problem solving styles, with different years of experience in education, levels of education, types of certificates, and education roles. Educators in their current roles focus on curriculum, instruction, and learning in different ways. They lead instruction and learning in the classroom and at school (Hoy & Hoy, 2003). They problem solve and make decisions (Martin, 2007). Their leadership is shared through “coaching, reflection, collegial investigation, study teams, explorations into uncertain matters, and problem solving” (Blasé & Blasé, 2004, p. 4).

This study addressed the following research questions:

1. Is there a significant difference in scores on the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*) between educators based on their preferences for problem solving styles produced by the three *VIEW* dimensions (*OC*: E-e-d-D; *MP*: E-e-i-I; and *WD*: P-p-t-T)?
 - a. Is there a significant difference in scores on the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*) between educators on the Orientation to Change dimension who prefer the well-defined

Explorer (E), moderate Explorer (e), moderate Developer (d), or well-defined Developer (D) Problem-Solving Style?

- b. Is there a significant difference in scores on the MLQ leadership styles (*transformational, transactional, and passive/avoidant*) between educators on the Manner of Processing dimension who prefer the well-defined External (E), moderate External (e), moderate Internal (i), or well-defined Internal (I) Problem-Solving Style?
- c. Is there a significant difference in scores on the MLQ leadership styles (*transformational, transactional, and passive/avoidant*) between educators on the Ways of Deciding dimension who prefer the well-defined Person (P), moderate Person (p), moderate Task (t), or well-defined Task (T) Problem-Solving Style?
- d. Are there significant interactions among the three *VIEW* dimensions (*OC, MP, WD*)?

2. To what degree and in what manner are the types of leadership produced by the MLQ (*transformational, transactional, and passive/avoidant*) each predicted by the dimensions of problem solving style (*OC, MP, and WD*), gender, years of teaching experience, highest degree earned, and type of certificate?
3. What are the perceptions of educators regarding their leadership and problem solving in K-12 settings?

A convergent parallel mixed method research design was used to better understand educators' leadership and problem solving styles. A quantitative causal comparative design was most appropriate for Research Question One. A quantitative correlational design was

most appropriate for Research Question Two. For Research Question Three, a general qualitative research design was used to analyze participants' responses to the free-response questions.

The researcher used a MANOVA to analyze Research Question One and three stepwise multiple linear regressions to analyze Research Question Two. For Research Question One, the independent variables were their preferences for problem solving styles produced by the three *VIEW* dimensions and their four levels (*OC*: E-e-d-D; *MP*: E-e-i-I; and *WD*: P-p-t-T), and the dependent variables were the MLQ leadership styles (*transformational*, *transactional*, and *passive/avoidant*). For Research Question Two, the dimensions of problem solving style (*OC*, *MP*, and *WD*), gender, years of teaching experience, highest degree earned, and type of certificate were used to predict participants' mean subscale scores on the leadership styles (the criterion variable) produced by the MLQ. Research Question Three was analyzed using three levels of coding techniques – open coding, axial coding, and selective coding (Saldaña, 2013).

Review of the Results

Research Question One

The results of the multivariate analysis indicated that the differences between the scores on the MLQ leadership subscales were significant ($F(3, 290) = 8.24, p < .001, \text{partial } \eta^2 = .079$) for the Orientation to Change group. The univariate analysis showed that the OC subgroups (*well-defined Explorer*, *moderate Explorer*, *moderate Developer*, *well-defined Developer*) differed in both areas of transformational leadership ($F(3, 290) = 6.96, p < .001, \text{partial } \eta^2 = .067$) and passive/avoidant leadership ($F(3, 290) = 4.44, p = .005, \text{partial } \eta^2 = .044$). Well-defined Explorers ($M = 3.22, SD = .48$), moderate Explorers ($M = 3.22, SD =$

.40), and moderate Developers ($M = 3.09$, $SD = .43$) scored significantly ($p < .05$) higher than those described as well-defined Developers ($M = 2.97$, $SD = .36$). Moderate Explorers ($M = 3.22$, $SD = .40$) also scored significantly ($p < .05$) higher than moderate Developers ($M = 3.09$, $SD = .43$).

The results of the multivariate analysis indicated that the differences between the scores on the MLQ leadership subscales were significant ($F(3, 290) = 4.60$, $p = .004$, *partial* $\eta^2 = .045$) for the Manner of Processing group. In addition, the results of the univariate analysis showed that the MP subgroups (*well-defined External, moderate External, moderate Internal, well-defined Internal*) differed significantly ($p < .05$) in the area of transformational leadership ($F(3, 290) = 3.68$, $p = .012$, *partial* $\eta^2 = .037$), and in the area of passive/avoidant leadership ($F(3, 290) = 3.13$, $p = .026$, *partial* $\eta^2 = .031$). Well-defined Externals ($M = .97$, $SD = .56$), moderate Internals ($M = 1.00$, $SD = .54$) and well-defined Internals ($M = .99$, $SD = .57$) scored significantly ($p < .05$) higher than the moderate Externals ($M = .79$, $SD = .52$).

There were no significant differences in mean scores of transactional leadership for the OC and MP subgroups. There were no significant differences in mean scores of all types of leadership for WD subgroups (*well-defined Person, moderate Person, moderate Task, well-defined Task*). There were no significant interactions between *VIEW* groups (*Orientation to Change, Manner of Processing, Ways of Deciding*).

Research Question Two

Transformational leadership. For transformational leadership, there were significantly ($p < .001$) positive correlations between Orientation to Change, gender, years of experience, highest degree earned, and type of certificate. When predicting the variation in the transformational leadership score, the predictor variables entered the regression equation

in four steps: (a) the highest degree earned entered the equation first, (b) gender second, (c) Orientation to Change: Explorer-Developer third, and (d) type of certificate entered the equation fourth, meaning that in each step the computer selected a predictor variable to enter the model based on its correlation with the criterion variable. The highest degree earned entered the equation ($t = 5.45, p < .001$) yielding a squared multiple correlation of $\Delta R^2 = .08$. Orientation to Change: Explorer-Developer entered the equation ($t = -4.307, p < .001$), yielding a change in the squared multiple correlation of $\Delta R^2 = .048$. When gender entered ($t = 3.883, p < .001$) the equation, the squared multiple correlation of $\Delta R^2 = .037$ was produced. The type of certificate entered ($t = 3.163, p = .002$) provided a final squared multiple correlation of $\Delta R^2 = .024$. The results indicated that the four variables were significant predictors of the variance in the mean scores of transformational leadership, $R^2 = .189$, adjusted $R^2 = .179, F(4, 338) = 19.673, p < .001$. Together they (highest degree earned, Orientation to Change, gender, type of certificate) explained 17.9% of the variation in transformational leadership scores, $f^2 = .22$, small.

Transactional leadership. There were no significant correlations between mean scores of transactional leadership and the predictor variables. The results of the stepwise regression indicated that none of the independent variables was a significant predictor of mean scores of transactional leadership.

Passive/Avoidant leadership. For passive/avoidant leadership, the results of the ANOVA indicated that type of certificate was a significant predictor of passive/avoidant leadership scores, $R^2 = .049$, adjusted $R^2 = .046, F(1, 341) = 17.40, p < .001$. Type of certificate explained 4.6% of the variation in passive/avoidant leadership scores, $f^2 = .05$, small.

Research Question Three

Research Question Three addressed the characteristics of an instructional leader, a teacher leader, and a problem solver. The responses were coded using open coding, axial coding, and selective coding (Saldaña, 2013). The participants perceived common characteristics among the instructional leader, the teacher leader, and the problem solver as it was shown in Tables 49 and 50. The emerging themes were: (a) personal characteristics, (b) interactions with others, (c) knowledge and experience, and (d) setting direction.

Comparison and Contrast of Findings with Existing Literature

Initially, the researcher focused on Hallinger's (1987) instructional model and learned over time that this model emphasizes the principal's role as an instructional leader, leading instruction from the "top", setting goals to school improvement, and monitoring student progress. In Hallinger's model, the relationship between the principal and the teachers appears to be hierarchical. The principal supervises and evaluates instruction. The principal also promotes teachers' professional development, and provides incentives for learning. Blasé and Blasé (1999) in their Reflection Model extend this role to explore the nature of support that the teachers receive from their principals. In the area of supervision and evaluation, the principal talks with the teachers to promote reflection. In the area of professional development, the principal uses his or her knowledge and experience to promote professional growth and encourage innovation. He or she supports collaboration among staff and coaching relationships. Leithwood and Jantzi (1999) in their transformational leadership model go beyond reflection to develop shared leadership between the principal and the teachers. Educators, principals and teachers, are leaders in their contexts and share similar

leadership characteristics as they focus on teaching and learning, school wide or in the classroom (Hoy & Hoy, 2003).

The current study examined educators' leadership regardless of their role or position. Results of Research Question One indicated that educators' leadership in a K-12 setting is transformational in nature. Yet, it is complex and multidimensional (Spillane et al., 2003). It is more than a set of practices that educators demonstrate to perform their duties. As per States' requirements, educators should have knowledge of curriculum and standards, and knowledge of theories of teaching and learning. Educators should develop plans with a focus on teaching and learning. The results of Research Question Three reflected these requirements as part of the knowledge and experience theme.

The qualitative data analysis in Research Question Three further suggested that the participants perceived instructional leaders as individuals with unique personal and interpersonal characteristics. These characteristics influence their behaviors whether they problem solve alone or with others. This is supported by the quantitative analyses in Research Question One. There were significant differences ($p < .0125$) between the participants' scores on the MLQ leadership subscales for Orientation to Change (*well-defined Explorer, moderate Explorer, moderate Developer, well-defined Developer*) and for Manner of Processing (*well-defined External, moderate External, moderate Internal, well-defined Internal*).

Educators' problem solving styles impact their teamwork, collaboration, and outcomes. Educators' preferences for problem solving are not part of the transformational leadership model, and there was a need for a second model which is the Problem Solving Style Model (Treffinger et al., 2007). Specifically, when responding to novelty, structure,

and authority, educators who prefer the developer problem solving style are usually well-organized and in control (Isaksen & Tidd, 2006). They are comfortable with existing rules and structures (Treffinger et al., 2007). In the current study, the OC subgroups differed significantly ($p < .05$) in both areas of transformational leadership and passive/avoidant leadership. Well-defined Explorers and moderate Explorers were more transformational than those described as well-defined Developers and not as passive/avoidant. When processing information, educators with internal problem solving style draw energy from reflection. They prefer to internalize information at their own pace before they share ideas or take actions (Treffinger et al., 2007). As per Research Question One analysis, the MP subgroups (*well-defined External, moderate External, moderate Internal, well-defined Internal*) differed significantly ($p < .05$) in the areas of transformational and passive/avoidant leadership. Externals scored significantly ($p < .05$) higher than those described as well-defined Internals, meaning that Externals were more transformational than the Internals. Furthermore, moderate externals demonstrated more transformational behavior than moderate Internals. When making decisions, educators with People problem solving style show empathy and favor developing and maintaining good relationships with others over high quality results (Treffinger et al., 2007). Although the results were not significant, the quantitative data analysis in Research Question Two indicated that educators with People problem solving style were not as transactional as those with Task problem solving style. This also was supported by Research Question Three results that the responses emphasized people-centered behavior, and therefore, interactions with others. These results were similar to Shaw et al.'s (2009) findings that the educators preferred the Person problem solving style because they built relationships with each other based on trust and respect. They were empathetic, helped

each other, and supported each other (Shaw et al., 2009). In the current study, educators also preferred the Developer problem solving style because of their emotional stability and creative thinking. They preferred the External problem solving style during teamwork, and sought input from others to make informed decisions (Shaw et al., 2009).

Results of Research Question Three were consistent with the model suggested by Robinson (2010) in which effective instructional leaders demonstrate content knowledge, solve complex problems, and build relational trust. There was no evidence of related literature on both problem solving style and leadership style of educators, in which leadership styles were examined based on problem solving style or in which one style was predicted from the other. Nevertheless, one study presented by Delcourt (2013) indicated that there were no significant differences in problem-solving and in leadership styles between graduates of a doctoral program in instructional leadership who hold an administrative certificate and those who do not. In Delcourt's (2013) study, the type of certificate was not a factor that influenced leadership style or problem solving style. In the current study, the type of certificate was a significant predictor variable of both transformational and passive/avoidant leadership, as the analyses to Research Question Two showed.

Limitations to the Study

Quantitative Threats

The quantitative threats that impact the study are both internal and external (Gall, Gall, & Borg, 2007) and encompass threats for survey research (Fraenkel & Wallen, 2006).

Internal threats to validity. The quantitative internal threats include mortality, instrumentation, and subject characteristics.

Mortality threat. A mortality threat occurs when something unexpected happens during the study and results in incomplete surveys (Fraenkel & Wallen, 2006). An example would be that some participants were interrupted while they were completing the questionnaires and, therefore, left some information blank. This was recorded as missing information. A mortality threat may have a medium to large effect on the study, depending on the number and types of missing items, the randomness of missing items, the patterns if there are any, and the impact of these items on the results of the study (Tabachnick & Fidell, 2013). Since 16 cases were deleted due to missing data, a total of 4.35% of the total number of respondents after unusable surveys were removed from the sample, history was seen as a small threat to this study.

Instrumentation threat. One issue related to instrumentation happens if the scoring procedure or the nature of the instrument is changed, which yields different results, and hence different interpretations (Fraenkel & Wallen, 2006). Instrumentation represented a medium threat in this study because there were two waves of data collection. To reduce this threat, the researcher used the demographic information that was common to both the original and the revised demographic survey.

Another issue related to instrumentation is data collector characteristic (Fraenkel & Wallen, 2006). It exists in survey research when data are collected at one point in time, when participants feel that the researcher is evaluating their knowledge or abilities, and they respond to meet the researcher's expectations (Fraenkel & Wallen, 2006). The researcher does not hold a supervisory position in any of the school settings. Therefore, she was not a threat to any participant. Data collector characteristic was viewed as a small threat to this research.

Subject threat. Subject characteristics threat is a major threat to internal validity in both causal comparative and correlational studies (Fraenkel & Wallen, 2006).

Causal comparative study. In a causal comparative research subject characteristics threat may occur because variables such as gender, ethnicity, years of experience, and, type of certificate cannot be manipulated (Fraenkel & Wallen, 2006). The results would be biased if the subjects who did not participate have different responses from those who participated. To reduce the effect of this threat and to encourage participation in the study, the researcher arranged with school administrators to have a specific time slot set aside for responding to the surveys.

Correlational study. In a correlational study, subject characteristics threat or selection bias may occur when people are selected for a study based on some variables, but some subject characteristics other than those identified as the independent variables can influence the dependent variable (Fraenkel & Wallen, 2006). In this study, the researcher selected variables such as individual problem solving style, gender, years of experience, level of education, and type of certificate that cannot be manipulated. To reduce the effect of subject selection bias, the researcher reported the characteristics of the subjects in detail, and verified that the assumption of multicollinearity among the selected predictor variables was met prior to analyzing the data for the statistical regression on each of the dependent variables (Meyers et al., 2006).

External threats to validity. The quantitative external threats consist of population validity and ecological validity.

Population validity. Population validity or generalizability “refers to the degree to which a sample represents” (Fraenkel & Wallen, 2006, p. 109) the accessible population.

Since this sampling process was based on volunteering and not on a stratified sampling procedure, the results cannot be generalized to the population. To accommodate for this limitation, the researcher selected a sufficiently large sample of K-12 educators from districts in rural, urban, and suburban areas and educators in a doctoral program that would be comparable to the target population in the school districts selected for the study.

Ecological validity. Ecological validity “refers to the degree to which results of a study can be extended to other settings or conditions” (Fraenkel & Wallen, 2006, p. 111). To minimize the impact of this threat, the researcher described the participants in enough detail to allow future researchers apply the results to similar settings.

Location threat. Another threat specific to causal-comparative designs includes the location of the survey administration (Fraenkel & Wallen, 2006). It occurs when administering the tests in different locations may impact the participants’ responses. The researcher held a total of 11 meetings in the four districts. Five meetings were held during faculty meetings in the media center or in the cafeteria where the school usually holds its monthly meeting. The six other meetings were voluntary meetings and were held at the end of the school day in the media center or in the cafeteria. In this study, the participants completed the questionnaires on site at the time the researcher administered the instruments. The researcher administered the assessments to participants during the voluntary meetings. When the researcher expected a high participation rate at a meeting, two additional research assistants assisted in the distribution and collection of the survey packets. To ensure that the different locations and test administrators did not bias or influence the results, the researcher and the test administrators kept their distance from the participants and did not provide any information that might bias the participants’ responses. To ensure data anonymity to the

researcher, a research assistant separated the signed informed consents from the completed questionnaires. Participants were requested to not write their names on the instruments. The researcher only accessed the data using the codes for data analysis. Code numbers assigned to *VIEW* were used instead of participants' names, as the researcher analyzed data by gender, years of experience in education, and current educational role. Data were confidential, and were only used by the researcher for the purpose of this study. No names of districts, schools, or participants were used throughout the reports.

Qualitative Threats: Trustworthiness

The researcher sought four aspects of qualitative *trustworthiness*: (a) *truth-value* or *credibility*, (b) *applicability* or *transferability*, (c) *consistency* or *dependability*, and (d) *neutrality* or *confirmability* (Krefting, 1991).

Truth value. Truth value or credibility refers to how well and how accurately a researcher can present multiple realities that informants may perceive. The researcher used triangulation to establish credibility of the study. She described the themes and patterns she found in the participants' responses to open-ended questions, and interpreted the findings to be able to compare these patterns and themes to the results of the quantitative research.

Applicability. Applicability or transferability refers to the ability to generalize the findings from the sample to another population. In a qualitative study, the ability to generalize may not be possible because the study may not be relevant to other settings. The researcher described the characteristics of the sample in detail, allowing future researchers to apply the results and methodology to other school settings.

Consistency. Consistency or dependability refers to reliable data and findings if the qualitative study was replicated with the same participants or in a similar context. In a

qualitative study, it is critical that the researcher learns about the different experiences of the informants. It is important that the researcher recognizes different sources of variability since “variability is expected in qualitative research” (Krefting, 1991, p. 175).

Neutrality. Neutrality or confirmability means that the research procedures and results are not biased. It “is achieved through rigor of methodology through which reliability and validity are established” (Krefting, 1991, p. 175). The findings are based on the informants’ experiences. In this study, the researcher achieved confirmability by auditing the data and using triangulation to verify the researcher’s interpretation of the data.

Implications of the Study for Educators

Research Question One

The results of this study indicated that there were significant differences between the scores on the MLQ leadership subscales for the OC group. The subgroups (*well-defined Explorer, moderate Explorer, moderate Developer, well-defined Developer*) significantly differed in both areas of transformational leadership and passive/avoidant leadership. This implies that in the area of transformational leadership, educators who are well-defined Explorers and are transformational may have some traits that appear to be negative to the Developer leader (Treffinger et al., 2007). In the area of passive/avoidant leadership, educators who are moderate Explorers and moderate Developers may perceive their well-defined Developer leaders as ineffective and boring (Treffinger et al., 2007). This implies that providing educators with training in problem solving style and group processes would be beneficial to learn about individual differences and therefore to enhance teamwork.

Explorers holding an administrative certificate tend to demonstrate more transformational behavior than other educators. Leaders with these characteristics tend to

encourage novelty and innovation in the classroom. Experienced educators often seek an administrative certificate to be considered for a promotion in their school or district, and to advance their educational knowledge. Their expertise and their new learning about school improvement and school leadership through the certification program contribute to their leadership knowledge, skills, and performances. This implies that teacher preparation programs need to design courses around school improvement as part of their program requirements.

Research Question Two

Educators who received training to qualify for an administrative certificate tended to demonstrate less passive/avoidant leadership behaviors than those who did not. Educators who meet the requirements of an administrative certificate are experienced teachers who seek leadership opportunities through training and higher levels of education. Therefore, they are less passive avoidant than others. This also implies that teacher preparation programs need to design courses around school improvement as part of their program requirements.

Research Question Three

The qualitative data analysis indicated that instructional leaders and teacher leaders shared similar characteristics that clustered in four common overarching themes: (a) personal characteristics, (b) interactions with others, (c) knowledge and experience, and (d) setting direction. The qualitative data indicated that about .5% of the participants identified administrators as instructional leaders and 15.5% of the respondents saw teacher leaders as instructional leaders. Questions arise as to whether the educators see opportunities as limited or unavailable for them to grow and to become instructional leaders. This implies that

educators other than the principal can be instructional leaders, and can be encouraged to see potential in themselves through training and professional development.

Directions for Future Research

Research Question One

The results of the multivariate analysis indicated that the differences between the scores on the MLQ leadership subscales were significant ($p < .0125$) for the Orientation to Change group in the areas of transformational and passive/avoidant leadership.

Future research could include examining how transformational leaders are either explorers or developers. Questions could arise in how they would differ. It would be interesting to find links between transformational leadership and the Explorer problem solving style. It also would be insightful to examine transformational leadership through the eyes of a Developer leader. Other questions related to the Orientation to Change: Explorer-Developer would include whether the OC subgroups would differ in their leadership based on the components of OC: (a) novelty, (b) structure and authority, and (c) search strategy.

Research Question Two

Transformational leadership. The stepwise multiple regression results suggested that educators who have advanced degrees, who preferred the Explorer style to solve problems, and who held an administrative certificate were more likely to have high scores on the MLQ transformational leadership subscale.

When working in groups, there is a need to investigate the effect of training a group of educators in group process skills on their teamwork and leadership styles. It was found that learning about school improvement and school leadership through the administrative certification program contributed to educators' leadership knowledge, skills, and

performances. Would courses on school improvement and school leadership as part of the requirements of teacher education programs help develop future educators' leadership? Would future educators become more transformational? Would creating new opportunities for educators help them realize that they are the instructional leaders?

Passive/avoidant leadership. The results of the statistical regression indicated that the type of certificate, gender, and Orientation to Change were significant predictors of passive/avoidant leadership scores. Educators who received the training to qualify for an administrative certificate and who preferred the Explorer problem solving style tended to demonstrate less passive/avoidant leadership behaviors. Based on the data, female educators were less passive/avoidant than male educators. It would be insightful to examine strategies to prevent passive/avoidant leadership.

Chapter Summary

A review of the theories on instructional leadership and problem solving style was made in light of the educational reforms and their impact on leadership in K-12 educational settings. Three research questions were addressed in this study with a focus on K-12 educators' leadership styles assessed by MLQ (*transformational*, *transactional*, and *passive/avoidant*) and their preferences for problem solving styles produced by the three *VIEW* dimensions (*OC*, *MP*, *WD*). In Research Question One the researcher examined differences in educators leadership styles based on their problem solving styles. In Research Question Two she explored the relationship and the manner in which the types of leadership produced by the MLQ each predicted by the dimensions of problem solving style, gender, years of teaching experience, highest degree earned, and type of certificate. In Research

Question Three the researcher analyzed qualitative data based on educators' responses to three open-ended questions about their perceptions of leadership and problem solving.

This study employed a convergent parallel mixed method research design that combined quantitative and qualitative approaches. A quantitative causal comparative research design was applied to address Question One and a correlational design was used to address Question Two. A generic case study based on the perceptions of the participants about instructional leadership, teacher leadership, and problem solving was used to address Question Three.

The multivariate analysis showed significance ($p < .0125$) between the scores on the MLQ leadership subscales for the OC group and the MP group. The OC subgroups (*well-defined Explorer, moderate Explorer, moderate Developer, well-defined Developer*) differed significantly ($p < .05$) in the areas of transformational leadership and passive/avoidant leadership. The MP subgroups (*well-defined External, moderate External, moderate Internal, well-defined Internal*) differed significantly ($p < .05$) in the areas of transformational leadership and passive/avoidant leadership. The stepwise multiple regression results suggested the following:

1. Educators who had advanced degrees, preferred the Explorer style to solve problems, and met administrative certificate requirements, were more likely to have high scores on MLQ transformational leadership subscale.
2. Educators who received the training to qualify for an administrative certificate tended to demonstrate less passive/avoidant leadership behaviors.
3. Female participants scored higher on the transformational leadership subscale than male participants.

Based on the participants' perceptions of leadership and problem solving, four themes emerged: (a) personal characteristics, (b) interactions with others, (c) knowledge and experience, and (d) setting direction.

The study implies that providing educators with training in group processes would facilitate learning about individual differences and therefore enhance teamwork. Learning about school improvement and school leadership through an administrative certification program contributes to educators' leadership knowledge, skills, and performances. Teacher preparation programs may need to design courses around school improvement as part of their program requirements in order to develop future educators' leadership in the classroom and their professional learning communities. All educators, in addition to the principal, can be instructional leaders, and can be encouraged to see potential in themselves through training and professional development.

Future research could include examining transformational leadership based on the Orientation to Change: Explorer-Developer problem solving style, what links it to an Explorer leader, and what makes it challenging to a Developer leader. When working in groups, there is a need to investigate the effect of training a group of educators in group process skills on their teamwork and leadership styles. Would courses on school improvement and school leadership as part of the requirements of teacher education programs help develop future educators' leadership? Would future educators become more transformational? Would creating new opportunities for educators help them realize that they are the instructional leaders?

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Appendices

Appendix A: Characteristics of the Participating Districts

Characteristics of the Participating Districts

Characteristics	District A	District B	District C	District D	State
Type of District	Rural	Suburban	Suburban	Urban	All
Number of Public Schools	5	4	5	18	1,049
Grade Range	K-12	PK-12	PK-12	PK-12	PK-12
District Reference Group	C	B	D	H	All
Student Enrollment	968	3,029	3,042	10,186	569,237
% of Students Who Are Not Fluent in English	0.9	1.0	3.2	18.9	5.3
% of Students Who Are Eligible for Free/Reduced-Meals	4.9	6.9	13.4	32.6	32.9
% of Students Who Receive Special Education Services	13.6	11.0	11.1	10.7	11.7

Source: State Department of Education (n.d.)

(continued)

Characteristics of the Participating Districts

Characteristics	Districts						State
	A	B	C	D	Total	%	%
Total Number of Teachers	93	209	240	668	1,210	83.6	82.0
General Education Teachers	80	179	207	579	1,045	72.2	70.9
Special Education Teachers	13	30	33	89	165	11.4	11.1
Teachers' Average Years of Experience	17	14	12	12	12.7		12.6
% of Teachers with Master's Degree or Above	86.7	74.9	77.2	76.7	77.3		81.4
Instructional and Library/Media Specialists	3	6	10	43	62	4.3	5.4
Administrators, Coordinators, and Dept. Chairs	9	17	15	48	89	6.1	6.2
Counselors, Social Workers, and School Psychologists	6	15	17	49	87	6.0	6.1
Total Number of Educators	111	247	282	808	1,448	100.0	

Source: State Department of Education (n.d.)

Appendix B: Wave 1 Cover Letter, Informed Consent Form, and Follow-Up Email

Cover Letter

Dear Colleague,

My name is Reine Issa, and I am a Math teacher at Bethel High School in Bethel, Connecticut. I am conducting a pilot study for my dissertation. I am looking for ----- past and current doctoral students who would like to participate. My study is to examine doctoral students' perception of instructional leadership characteristics and problem solving styles.

Participation is voluntary, and it includes the following:

1. A demographics checklist and three qualitative questions – 10 minutes
2. Taking the Multi-Factor Leadership Questionnaire (MLQ) (Form 5X) – 15 minutes
3. Taking VIEW: An Assessment of Problem Solving Style – 10 minutes

All information will be completely confidential to the program coordinator and will be coded by a graduate assistant. You do not write your name on the instruments. I will only access the data using the codes for data analysis.

Results of the study will be shared with you. You will have access to the aggregated data and to your own profile for each subscale. The program coordinator will give you your profile from the data base and will provide a review of your profile.

I hope that you consider being a part of this study. I would like your help so that I have a good sample representative of teachers and administrators from all cohorts. As doctoral students in an Ed. D program in Instructional leadership, I think that this study will help us learn more about our problem solving styles and leadership characteristics. Please feel free to ask me any questions. Your response to this e-mail is not an obligation to participate.

Thank you for considering my request. Please read the attached consent form. You can download it, electronically sign it, and e-mail it to me at issar@connect.wcsu.edu so that I can mail you the questionnaires to complete as soon as possible. I will include a stamped, self-addressed envelope in the mailing so that you mail me back the completed questionnaire.

Reine

Informed Consent

1. Purpose of the Study:

The purpose of the study is to obtain a quantitative data regarding doctoral students' perception of instructional leadership characteristics and problem solving styles. Studies on this topic have not been done and there is a need for empirical research that describes instructional leadership for all educators. The study will also research the perceptions of the two types of doctoral students (*teachers* and *administrators*) of leadership and problem solving. Subjects represent educators from all genders with a range of age, gender, years of experience in education, and their current school settings.

The project has been reviewed by WCSU's human subjects review committee, the Institutional Review Board (IRB).

By signing this form and completing the attached questionnaires, I consent to participate in the study.

2. Description of Experiment:

Human subjects will be WCSU past and current doctoral students. They are expected to be involved only once to complete the MLQ questionnaire and the VIEW assessment. The total time needed to administer both instruments is approximately 25 minutes, 15 minutes for the MLQ and 10 minutes for the VIEW. Administration of these instruments will take place in the fall of 2010. Graduates will receive the MLQ and VIEW assessments by mail as soon as they send their consent to the researcher. Current students will complete the assessments in class as it is arranged with the classroom professor. The assessments will be administered by a graduate assistant. The students who are not willing to take the assessments may leave the classroom during testing.

3. Confidentiality of Data:

Please be assured that any information that you provide is confidential to the program Coordinator and is anonymous to the researcher. Your name on this form will not be linked in any computer database with the questionnaires that you complete or along with your responses. All data will be reported in group form only.

4. Contact Information:

Should you have any questions, please feel free to contact me. You can reach me on my cell: (XXX) XXX-XXXX, or by e-mail: issar@connect.wcsu.edu.

5. Voluntary Participation:

Please understand that your participation in this research is totally voluntary, and you are free to withdraw at any time during this study without penalty and to remove any of the data that you have contributed. You may receive a final report of the research results in aggregate form upon request to the Principal Investigator. You also will receive a copy of the consent upon participation.

I acknowledge that I have been informed of and understand the nature and purpose of this study and freely consent to participate. I acknowledge that I am at least 18 years of age.

Signed: _____ Date: _____

Print Name: _____

Thank you for considering my request.

Principal Investigator: Reine Issa

Follow up Email

Dear Colleague,

This cover letter and the attached informed consent letter are to encourage your participation in my pilot study for my dissertation. The purpose of the study is to examine doctoral students' perceptions of leadership characteristics and problem solving styles, and to determine relationships between types of leadership and dimensions of problem solving.

Participation in this study is voluntary. All information will be completely confidential to the program coordinator, and will be coded by a third party. You do not write your name on the instruments. I will only access the information using the codes. Results of the study will be shared with you. You will have access to the aggregated data and to your own profile for each subscale. The program coordinator will give you your profile from the data base and will provide a review of your profile.

I appreciate your willingness to participate in this research study. Please read the attached consent form. You can download it, electronically sign it, and e-mail it to me at issar@connect.wcsu.edu.

Your response is greatly appreciated.

Sincerely,

Reine

Appendix C: Wave 1 Researcher Created Survey

Please check what best describes you, one item per category.

Cohort Number

- 1
- 2
- 3
- 4

Current Position

- Teacher
- Administrator

Gender

- Male
- Female

Years of Experience in Education

- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21+ years

Current School Setting

- K-2
- 3-5
- 6-8
- 9-12

Qualitative Research Questions

Please answer these questions first before you complete the MLQ and VIEW assessments:

1. Describe your perceptions of an instructional leader.
2. Describe your perceptions of a teacher leader.
3. Describe your perceptions of a problem-solver.

Appendix D: Wave 2 Coded Paper

Coded Paper

Example of coded white piece of paper for participant to keep:

Code #

For info on your leadership style and problem solving style, contact Reine Issa at issar@connect.wcsu.edu

Example of coded colored paper for participants to participate in the raffle:

Code #

Appendix E: Wave 2 Cover Letter and Informed Consent Form

Cover Letter

Dear Educator,

This cover letter is to encourage your participation in my doctoral research study in instructional leadership at Western Connecticut State University (WCSU). I am looking for K-12 educators who would like to participate. The purpose of my study is to examine educators' perceptions of their leadership characteristics and problem solving styles to better understand the construct of leadership.

Participation is voluntary, and it includes the following:

1. A demographics survey and three open-ended questions – 10 minutes
2. Taking the Multi-Factor Leadership Questionnaire (MLQ) (Form 5X) – 15 minutes
3. Taking *VIEW: An Assessment of Problem Solving Style* – 10 minutes

All information will be completely confidential to the researcher and the questionnaires will be coded by a graduate assistant. You do not write your name on the instruments. I will only access the data using the codes for data analysis. The data to be collected will not be used for any educator evaluation or performance judgment _____
_____ Public Schools. It is only for research purposes.

You will have access to the aggregated data and to your own profile for each subscale. If you would like to receive your individual profile from the database, please keep the white piece of paper that indicates the code of the packet and the researcher's contact information, and email the researcher indicating your code and your interest in receiving a copy of your profile.

I hope that you consider being a part of this study. I would like your help so that I have a good sample representative of educators from all grade levels, with varying levels of teaching experience, and with different roles.

Thank you for considering my request. Please read the attached consent form. You can sign it and return it to me with the completed questionnaires in the attached envelope.

I appreciate your participation. Please put the coded colored piece of paper in the raffle envelope and keep the coded white piece of paper to verify the winning code.

Participating teachers will be included in a \$15.00 XXXX raffle drawing; two teachers from your school will randomly be selected by your principal on the next faculty meeting.

Participating administrators will be included in a \$25.00 XXXX raffle drawing; one administrator from your district will randomly be selected by your district's superintendent.

Sincerely,

Reine Issa

Informed Consent

1. Purpose of the Study:

The purpose of the study is to obtain quantitative data regarding educators' perception of instructional leadership characteristics and problem solving styles. Studies on this topic have not been done and there is a need for empirical research that describes instructional leadership for all educators. The study will research the perceptions of educators (teachers, teacher leaders, support staff, and administrators) of leadership and problem solving. The study will also examine how years of experience in education and years in current position impact these perceptions. Subjects represent educators with varying types of certification, years of experience in education, and teaching experience from public school districts K-12 in the northeast of the United States.

This research project has been reviewed and approved by the WCSU Institutional Review Board. If you have questions concerning the rights of the subjects involved in research studies please call the WCSU Assurances Administrator at irb@wcsu.edu and mention Protocol Number 1213-26. This study is valid until 10/18/2013.

By signing this form and completing the attached questionnaires, I consent to participate in the study.

2. Description of the Study:

Human subjects will be teachers and administrators K-12 from urban, suburban, and rural districts in the northeast of the United States. They are expected to be involved only once to complete the MLQ questionnaire and *VIEW* assessment. The total time needed to administer both instruments is approximately 35 minutes, 15 minutes for the MLQ and 10

minutes for *VIEW*. Administration of these instruments will take place in November 2012 through January 2013 at a participating school's faculty meeting or pre-scheduled meeting. Individuals willing to participate in the study will read the cover letter, sign the informed consent, complete the demographics questionnaire and the MLQ and *VIEW* assessments, secure them in an envelope that was attached to the instruments and return them to the researcher administering the assessments. Individuals who are not willing to take the assessments may leave the meeting room during administration of these instruments.

3. Confidentiality of Data:

Please be assured that any information you provide is confidential to the researcher. The data to be collected will not be used for any teacher or administrator evaluation or performance judgment at his or her school or district. Information provided is only for research purposes. It will be completely confidential to the researcher and the questionnaires will be coded for data analysis. All responses will be secured in a filing cabinet. The results will be used for research purposes only and the participants' identities will remain anonymous. All data will be reported in group form only. Upon request of individual participants who identify themselves by the codes of their packets, the researcher will give them their individual profiles from the data base.

4. Contact Information:

Should you have any questions, please contact me at (XXX) XXX-XXXX or by e-mail at issar@connect.wcsu.edu. If you have questions regarding your rights as a participant in this study, you may contact the WCSU Institutional Review Board at irb@wcsu.edu.

5. Voluntary Participation:

Please understand that your participation in this research is totally voluntary, and you are free to withdraw at any time during this study without penalty and to remove any of the data that you have contributed. If you would like a copy of your profile, please indicate so on the consent form.

I acknowledge that I have been informed of and understand the nature and purpose of this study and freely consent to participate. I acknowledge that I am at least 18 years of age.

Signed: _____

Date: _____

Thank you for considering my request.

Principal Investigator: Reine Issa

Appendix F: Wave 2 Researcher-Created Survey

Demographics Survey

Directions: Please check the box that best describes you and provide any additional information.

1. Gender

Male Female

2. Ethnicity

Hispanic-American African-American Native-American
Caucasian-American Asian-American/
Pacific Islander Other: Please specify _____

3. Years of Experience in Education _____

4. Years of Teaching Experience _____

5. Current Role – Check all that apply:

Teacher Administrator Department Chair
Curriculum Coordinator Curriculum Coach/Mentor Support Staff
Other: Please specify _____

6. If you are a teacher, please specify:

- Subject area currently teaching _____
- Grade level now teaching _____

7. Highest Degree Earned

BA/BS MA/MS Sixth year/ Ed. Spec.
Ph.D./Ed.D. Professional Diploma Other:
Please specify _____

8. Certificate of Endorsement – Check all that apply:

Educator certification

6th year certificate

Please indicate area of 6th year certificate _____

Administrative certificate (092)

9. In your current role rate how you see yourself on a scale of 1-5 (1 least likely , 2 somewhat unlikely, 3 neutral, 4 somewhat likely, 5 most likely) as a (an):

Instructional leader _____

Administrative leader _____

Teacher leader _____

Problem-solver _____

Open-Ended Questions

10. In your experience, what are the characteristics of instructional leaders, whether they are in an administrator or teacher role?

11. In your experience, what are the characteristics of a teacher leader?

12. When you think of instructional leaders, whether they are in administrator or teacher roles, what are the characteristics you notice about their problem solving?

(Please use back of page for additional space.)

Appendix G: Non-Participation Form

Non-Participation Form

Directions: Please check the boxes that best describe you and provide any additional information about why you decided not to participate in this study.

1. Gender

Male Female

2. Ethnicity

Hispanic-American African-American Native-American

Caucasian-American Asian-American/ Other:

Pacific Islander Please specify _____

3. Years of Experience in Education _____

4. Current Role – Check all that apply:

Teacher Administrator Department Chair

Curriculum Coordinator Curriculum Coach/Mentor Support Staff

Other: Please specify _____

5. I do not want to participate in the study. Please check all that apply:

I am not interested in the study.

I do not have the time.

Other: Please specify _____

Appendix H: Qualitative Data Code Book

Code Book

Axial Codes	Open Codes
Assuming authority	Assigning roles Being in power; authoritative (in control) Directional (communicating initiatives and/or policies) Finding resources (providing resources, managing resources, making use of resources) Having leadership role Involved in discipline (rules, regulations, school policies) Manager/management skills Developing a plan/activating a plan Running meetings
Being flexible	Adaptive/adapting Considering alternate solutions Flexible (multi-task) Making decisions quickly to adjust to a situation; solving problems quickly as they arise; thinking quickly in response to a situation; practical; hands-on; time sensitive Seeing multiple perspectives Versatile

(continued)

Code Book

Axial Codes	Open Codes
Building teams	Being democratic
	Collaborating
	Compromising (give and take, find the middle ground, peacemaker)
	Considering multiple perspectives or points of view
	Creating culture of collaboration
	Creating harmony (consistency)
	Facilitating collaboration
	Helping build teams (using group process; fostering a sense of team)
	Involved in curriculum
	Keeping group on task
	Making suggestions
	Participating (volunteering)
	Seeking help from others
	Sharing decision making
	Sharing information (knowledge)
Team player	

(continued)

Code Book

Axial Codes	Open Codes
Building trust	Being reliable (dependable)
	Creating culture of trust
	Delegating authority
	Respectful
	Respected
	Self-sacrifice
	Sharing decisions
	Trusted
	Trusting
	Well-known

(continued)

Code Book

Axial Codes	Open Codes
Classroom related behavior	Classroom management Focus on instruction (differentiated instruction , curriculum, curriculum and pedagogy; using best strategies) Focus on learning (learning strategies, 21 st century skills, content mastery, citizenship, inquiry, multiple intelligences, learning strategies, whole child) Focus on teaching (teaching and instruction, teaching and learning, instruction and assessment) Focusing on student achievement Having teaching experience Influencing curriculum in the classroom Monitoring student progress (ensuring content mastery) Promoting dialogue/best practices Providing professional development Supporting instruction Supporting/Seeking classroom improvements, effective practices, or innovations in content Working with challenging kids

(continued)

Code Book

Axial Codes	Open Codes
Cognitive ability	Assigning priorities
	Evaluating (curriculum, learning, instruction, situations)
	Good judgment
	Having analytical ability (analyzing staff and student needs, analyzing data)
	Intelligent
	Reasoning (finding causes of problems)
	Solving problems
	Thinking critically (critical thinker)
	Thinking multi-dimensionally
	Thinking skills
	Thinking strategically
	Understanding the problem

(continued)

Code Book

Axial Codes	Open Codes
Creative person	Asking questions
	Creative (creating culture of creativity; designing instruction, curricula, finding solutions, teaching, working with students)
	Curious
	Finding problems (identifying areas in need of improvement, seeing the big picture)
	Innovative
	Inquisitive
	Insightful
	Learning from mistakes
	Open-minded
	Sense of humor
	Thinking creatively
	Thorough (detail-oriented)
	Trying different approaches
	Unique
	Charismatic

(continued)

Code Book

Axial Codes	Open Codes
Decision making	Gathering information (facts, data driven-student data/assessments, research based) Seeking input (information) Finding solutions Making decisions (making the right decisions)
Emotional stability	Accurate self-assessment Assertive, decisive, determined Calm Courageous Humble Independent, outspoken Mature Not judgmental; objective Optimistic Organized; strong organizational skills Outgoing; sociable Predictable during crisis Risk-taking Self-confident, confident

(continued)

Code Book

Axial Codes	Open Codes
Ethics and integrity	Aspiring
	Being accountable
	Being ethical
	Consistent
	Fair
	Good for all (using book of law)
	Having beliefs and values
	Honest (direct)
	Moral
	Promoting educational equity (promoting learning for all students)
	Sense of values

(continued)

Code Book

Axial Codes	Open Codes
Having the knowledge	Educated; knowledgeable Experienced (in educational settings) Knowledge of computers Knowledge of school culture Knowledge of curriculum (frameworks, teaching practices, research and issues in education, current trends) Knowledge of teachers (diversity, adult learning, motivation, and professional development) Knowledge of teaching (instruction, instructional practices – best practices, direct instruction, cooperative, discovery, etc.) Knowledge of students (development, diversity, cognitive styles, learning styles, multiple intelligences) and their needs Knowledge of assessment of learning (student data; monitoring student progress) Knowledge of leadership models Knowledge of parents and community, and their needs

(continued)

Code Book

Axial Codes	Open Codes
Limitations	Does not communicate
	Does not listen
	Jumps to conclusion
	Lack of facts
	Lack of resources
	Lacks emotions
	Limited classroom instruction
	Mandates
	No solution
	Paper pusher
	Short on time
Time frame	
Unprepared for the job	
Monitoring and evaluating	Assessing data

(continued)

Code Book

Axial Codes	Open Codes
Negative characteristics	Close-minded
	Impulsive
	Indecisive
	Negative
	Not clear
	Not fair
	Not right
People-centered behavior	Approachable
	Being visible
	Celebration of successes; Recognition and praise
	Coaching others; mentoring others
	Communicating district policy, strategies (best practices), information, initiatives, or vision
	Communicating with others (followers, staff and students, families)
	Empowering them
	Encouraging discussion
Encouraging innovation	

(continued)

Code Book

Axial Codes	Open Codes
People-centered behavior	Engaging others
	Expressing confidence in others
	Fostering others' perspectives (creativity)
	Having interpersonal skills
	Helping others
	Initiating change (developing programs, making change based on need, institute meaningful change, making improvement by department or school wide)
	Interest in others (students, teachers, community)
	Leading others (influential persuasive)
	Listening
	Motivating others
	Promoting dialogue
	Promoting reflection
	Providing feedback (constructive, meaningful, instruction, teaching)
	Relationship with others (rapport)
	Sensitive to the needs of others (always available)

(continued)

Code Book

Axial Codes	Open Codes
People-centered behavior	Supporting others/teachers (advancement, growth, and achievement; helping others improve; advocate; voice needs of others; nurturing) Sympathetic (caring, compassionate, empathetic, patient) Teaching teachers Understanding others

(continued)

Code Book

Axial Codes	Open Codes
Positive Characteristics	Being competent
	Clear
	Diplomatic
	Forgiving
	Good
	Inherent leadership qualities
	Inherent teaching qualities
	Kind
	Liked (personable)
	Passionate
	Patient
	Positive
	Punctual
	Responsible

(continued)

Code Book

Axial Codes	Open Codes
Role	Administrator All educators Department head Not administrator School leader Teacher (leader in classroom)
Role model	Accepting feedback Inspiring Leading by example (walking the talk) Modeling best practices Professional

(continued)

Code Book

Axial Codes	Open Codes
<i>Self-motivated</i>	Adding own responsibilities (choosing to do more) Being ambitious Being energetic Being productive (effective, efficient) Enthusiasm, intrinsic motivation, persevering (persisting), persuasive, spontaneous, dedicated, dynamic Hard working (diligent, conscientious, thorough, attentive, careful, prepared) Initiative to take action; taking initiative Life-long learner Being reflective (thoughtful, contemplative, introspective) Proactive Seeking improvement (personally; seeking opportunities; challenging themselves) Tenacious (confronting issues; persisting to do the right thing intelligently) Willing to learn

(continued)

Code Book

Axial Codes	Open Codes
Setting direction	Achieving/achievement – participative or directive Aligning information with goals Being visionary (building vision, having vision, mission driven, sharing vision) Developing a plan Directing others Focused (task, solution) Following through Setting expectations (realistic, high) Setting goals (clear, specific, and challenging) – activating plans; facilitating initiatives; focusing on school results; improving curriculum, pedagogy, or assessment; improving teaching and learning; seeking school improvement; seeking department improvement; improving outcomes

Appendix I: Confirmability Audit Report

Audit Report for Reine Issa's Dissertation Research

A confirmability audit was completed on the qualitative portion of the researcher's dissertation project in March 2014 by Marguerite Aldrich, Ed.D. Dr. Aldrich had conducted a qualitative dissertation study using Saldana's coding methods, the same methods used by the researcher. The researcher initially provided the auditor with the following: (a) chapter 1 of the study, (b) the research questions, (c) the three open-ended questions that were posed to participants, (d) the code list of all working open and axial codes (one sorted by axial codes, the other sorted by open codes), and (e) the complete responses along with respective open and axial codes for 30 respondents.

During the first review of the coding, the auditor examined the responses to the first two questions of the 30 respondents, or a total of 232 responses. The auditor agreed with the researcher on 91% of the open codes and 89% of the axial codes. In some cases, the auditor agreed with the initial coding, but added an additional code to a response. For example, in response to the first question regarding the characteristics of an instructional leader, the statement read, "...motivate at the same time that they can direct and guide the educational process." The researcher had provided an open code of "motivating others" and axial code of "people-centered behavior". The auditor added a second open code of "directing others" and axial code of "setting direction" because she felt there were two distinct messages in the response, one pertaining to motivating, and the other pertaining to directing. In other cases, the auditor disagreed with the initial coding and offered an alternative code. For example, in regards to the response to the second question pertaining to the characteristics of a teacher-leader, the statement "to bring out the best in others" was initially coded with an open code of "foresight" and an axial code of "creative person". The auditor suggested the open code

of “encourage others” and axial code of “people-centered behavior” in lieu of the initial coding.

At this point in the audit, the researcher and auditor discussed the definitions of some of the codes and the discrepancies in interpretations. The researcher made the agreed upon changes to the codes and adjusted for those changes in the entire databank. During the second review of the coding, the auditor examined the responses to all 3 questions of the 30 respondents, or a total of 349 responses. The auditor reviewed the data a second time—this time resulting in a 97.4% agreement in the 349 open codes, and a 92.4% agreement in 406 open to axial codes. Most of the discrepancies at this point were a matter of semantics in the assignment of open codes to axial codes. For example, “being humble” was initially coded to the axial code “positive characteristic” so the auditor suggested the axial code “emotional stability” instead; another open code “being productive” was initially coded to the axial code “positive characteristic” so the auditor suggested the axial code “self-motivated” instead.

Throughout the entire coding and recoding process, the researcher was highly organized and concerned with presenting an accurate interpretation of the qualitative data. The researcher then regrouped and sorted the open codes into conceptual categories, organized the codes by the three open-ended questions, and reported the frequencies of each. She identified the most frequently occurring categories as the dominant category for each of the three roles of instructional leader, teacher leader, and problem solver. This selective coding process resulted in four overarching themes for research question three. Finally, the researcher triangulated the results of her quantitative data from research questions one and two with the qualitative data from research question three to summarize the results of her study pertaining to transformational, transactional, and passive/avoidant leadership styles.