November 1st, 2017

Sustainable Change in Public School Districts

Angela Cheri Franklin
Seattle Pacific University

Sustainable Change in Public School Districts

by

Angie Franklin

Dissertation

Presented to the Faculty of the

Graduate School of Education at

Seattle Pacific University

In Partial Fulfillment of the Requirements for the

Doctor of Education Degree

Seattle Pacific University

March 2017

Sustainable Change in Public School Districts

by

Angie Franklin

A dissertation submitted in partial fulfillment

of the requirement of the degree of
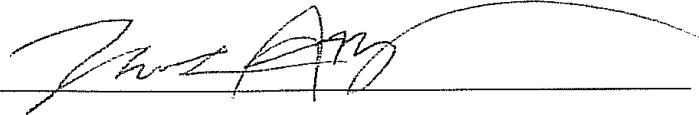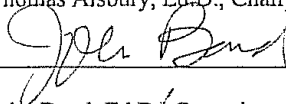
Doctor of Education
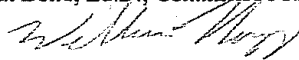
Seattle Pacific University

2017

Approved by _____

(Thomas Alsbury, Ed.D., Chairperson of the Dissertation Committee)

_____

(John Bond, Ed.D., Committee Member)

_____
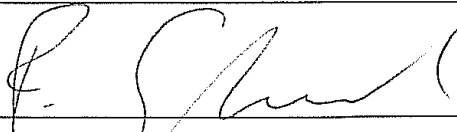
(William Nagy, Ph.D., Committee Member)

Program Authorized to Offer Degree <u>School of Education</u>

Date _____OCTOBER 2017_____

_____

(Rick Eigenbrood, Ph.D., Dean, School of Education)

Copyright Page

In presenting this dissertation in partial fulfillment of the requirements for the

Doctoral degree at Seattle Pacific University, I agree that the library shall make its copies

freely available for inspection. I further agree that extensive copying of this dissertation is

allowable only for scholarly purposes, consistent with "fair use" as prescribed in the U.S.

Copyright Law. Requests for copying or reproduction of this dissertation may be referred

to University Microfilms, 1490 Eisenhower Place, P.O. Box 975, Ann Arbor, MI 48106,

to whom the author has granted "the right to reproduce and sell (a) copies of the

manuscript in microfilm and/ or (b) printed copies of the manuscript from microfilm."

Signature _Angela C Franklin_

Date _10-23-17_

Table of Contents

List of Tables

List of Figures

Acknowledgements

This dissertation is dedicated to my family (my husband Doug, my sons: Cooper and Jonah, my parents: Dan and Ginny, my siblings, and many others) who were patient, loving, and encouraging throughout this journey. I would also like to thank my dissertation chair, Dr. Alsbury, for providing just the right amount of guidance to enable me to learn and grow. Additionally, I would like to thank the other members of my dissertation committee: Dr. Bond and Dr. Nagy for their questions and encouragement. Finally, I would like to thank my mentors who have always challenged me with the right level of pressure and support to help me grow as an educator and leader.

Seattle Pacific University

Abstract

Sustainable Change in Public School Districts

By Angie Franklin

Chairperson of the Dissertation Committee: Thomas Alsbury, Ed.D.

School of Education

Reform is a reality for many school districts and schools. When faced with reform movements, districts and schools must address both the immediate implementation and the sustainability of the reform. This dissertation study is informed by two theories centered on reform implementation and sustainability: Organizational Learning Theory by Leithwood, Aitken, and Jantzi (2006) and Coburn's (2003) Theory of Sustainability. Current empirical research in this field identified particular factors that lead to successful implementation of reform and long-term sustainability. A monitoring tool was used to investigate factors such as: vision for reform, decision making, professional development, innovation and change, effectiveness of reform, leadership, accountability, use of data for continuous improvement, value for diversity, climate, organizational learning, systems thinking, and innovation and creativity. Factors were collected and analyzed for one school district's large-scale mathematics reform. Descriptive data was gathered to analyze teacher perception relative to these variables, which were identified as either strengths to current reform or potential barriers to future sustainability. Additionally, statistical analysis aided in the identification of statistically significant associations between teachers with differing levels of implementation experience and teacher perception associated with key reform variables.

Chapter One

Introduction

Historical Context

Change is a reality for today's public school systems. This is due, in part, to the federal accountability movement. Over the past several decades, the Federal Government has taken a greater stand on issues related to public education. In 1983, the Federal Government published *A Nation at Risk*, which emphasized the need for change, based on the continuing decline in achievement and stressed the importance "for government at all levels to affirm its responsibility for nurturing the nation's intellectual capital" (U/S. Department of Education, 1983, p. 1). The document called for renewed commitment to educational reform at all levels. Many changes to public education, over the past 30 years, can be connected to the language in this document. *A Nation at Risk* served as a call to action on the part of the Federal Government to maintain involvement with many of the required changes mandated for American public school systems.

The passage of the No Child Left Behind Act of 2001 was an example of the Federal Government seeking ways to increase the accountability of school test performance, particularly for traditionally lower performing students (U.S. Department of Education, 2001). The No Child Left Behind Act of 2001 served as an amendment to the Elementary and Secondary Education Act of 1965 and outlined the requirements of states regarding student achievement and district accountability. The purpose of NCLB, as outlined by the document, was to "ensure that all children have a fair, equal, and significant opportunity to obtain a high-quality education and reach, at minimum, proficiency on challenging State academic achievement standards and State academic

assessments" (p. 1). The document addressed areas such as: academic assessments, accountability systems, professional development for teachers, curriculum, challenging academic standards, the importance of meeting the needs of all children, the closing of the achievement gap, the need to provide children with enrichment programs, the promotion of school-wide reform, the involvement of families and community members, the coordination and allocation of educational resources, and the need to improve the quality of teaching.

The Race To The Top (RTTT) federal grant was one of the most recent federal accountability efforts and was initiated by the Obama administration in 2009 as an alternative to the requirements of NCLB (U.S. Department of Education, 2009). The Race To The Top Fund was a competitive grant program that attempted to encourage and reward states for many things, including: innovative reform, significant gains in student achievement, the closing of achievement gaps, improvement of graduation rates, and the preparation of students for college and careers. In order to qualify for these grant funds, states were required to adopt standards and assessments that prepared students for college, the workplace, and a global economy. They were also required to build data systems that measured student growth and success and provided teachers and principals with data, to guide improvement of instruction. Additionally, states were required to have a plan for hiring, training, rewarding, and maintaining high-quality teachers and administrators and were required to work at improving the lowest-achieving schools. As a direct result of this legislation, the majority of U.S. states adopted a new set of Common Core State Standards and a new State assessment system. Washington State also adopted new evaluation systems for both teachers and principals.

On October 10th, 2015, President Obama signed the Every Student Succeeds Act (ESSA; U.S. Department of Education, 2016). This bipartisan measure reauthorized the Elementary and Secondary Education Act (ESEA) and built on key work done by educators, parents, communities, and students over the past several years. ESSA highlighted the goal to better prepare students for college and careers. As reported by the U.S. Department of Education (2016), ESSA's focus has been on: rigorous college- and career-ready standards, annual statewide assessments of all students' learning, innovative local assessment and instructional practices, pre-kindergarten, competitive programs to reward various practices, and performance targets/school ratings that are state-driven and based on multiple measures. ESSA has also focused on accountability interventions and support for struggling schools, which were developed by states and stress support for the lowest 5% of schools and schools with high dropout rates. Dedicated funding will be provided to the lowest performing schools. The goal, as articulated by the U.S. Department of Education, is to advance equity for disadvantaged and high-needs students. Specifically, the department stated "there will be accountability and action to effect positive change in our lowest-performing schools, where groups of students are not making progress, and where graduation rates are low over extended periods of time" (http://www.ed.gov/essa). Because the signing of ESSA is still new and somewhat undefined, it is difficult to say how this law will impact districts and schools. Based on past practice, one can be relatively sure the requirements as outlined by ESSA will encourage districts and schools to make changes. The mandates and regulations required by federal and state governments often put very large strains on school districts and schools. In many cases, changes are related directly to school/student achievement, an

increase in academic rigor, college and career readiness, improvement of instruction,

coordination of efforts, involvement of key stakeholders, and allocation of resources.

Statement of the Problem

Because federal and state resources are tied directly to mandates and

school/district accountability, district-wide and school-level change is often directly

related and districts and schools must follow the specific requirements as outlined by

these mandates. Student-level progress is measured by State assessments and districts and

schools must use approved instructional approaches. These requirements guide changes

in districts and schools. If the requirements are not followed, districts/schools are at risk

of losing federal and/or state funding. According to Leithwood, Aitken, and Jantzi

(2006), districts and schools must adjust to changing priorities. Adjustment is especially

difficult in the absence of adequate funding. Districts and schools are forced to prioritize

reform efforts. Too many competing priorities can lead to confusion within the

organization. As a result, reform efforts become more difficult and those leading the

reform become frustrated and begin to lose faith in these efforts.

Alsbury (2012) stated, "many school reform initiatives have less than stellar

results, lack sustainable gains, and eventually fail as a result of ignoring the power of

complex organizational realities within schools" (p. 3). Mintzberg (1994) believed failure

of reform efforts may not be due to a lack of strategic planning or strategic thinking, but

may in fact be due to a lack of strategic action. According to Mintzberg, organizations

learn more about strengths and weaknesses through a conscious process of organizational

assessment and analysis. He stated: "action and thought must interact" (p. 292).

According to DiBella and Nevis (1998), dysfunctional aspects limit an organization's

effectiveness and/or performance. Senge (2006) stated organizations struggle, because of a tendency to focus on "snapshots" or isolated parts of the system. In order to address changes effectively, schools must have a plan for implementing and assessing systematic change efforts. They must also look critically at the sustainability of those efforts.

Purpose

Change is hard on school districts, schools, and the people directly involved in change efforts. It is often costly and can put a tremendous strain on both teachers and administrators. According to Leithwood et al. (2006):

increased demands on schools to become accountable typically spring from legitimate concerns that students may not be learning what they should or as much as they ought to learn and/or that school personnel are not efficient in their practices. But the consequences of tightening the accountability "screws" often are a narrowing and trivializing of the school curriculum and the creation of work cultures that reduce rather than increase professional commitments. (p. 2)

Additionally, a focus on accountability can lead to too much emphasis on student learning outcomes as the primary measure of effectiveness (Leithwood et al., 2006). While a focus on student learning outcomes may be needed, the narrowness of this focus might not provide districts and schools with the information necessary to assess the effectiveness and sustainability of reform efforts.

According to Leithwood et al. (2006), a focus on output measures may not suffice, because many factors influence the effectiveness of schools and districts. Senge (2006) wrote about a similar idea, but referred to it as a "fixation on events" (p. 21). He stated this type of fixation leads to explanations focused on specific occurrences and that

while these explanations may be true, they often distract the organization from "seeing the longer-term patterns of change that lie behind the events and from understanding the causes of those patterns" (p. 21). A narrow focus on student learning outcomes may be limiting the organization's understanding of the complex elements underlying district-wide and school-level reform. According to Thornton, Shepperson, and Canavero (2007) leaders often fail to understand the interconnectedness of reform components. When addressing barriers to reform, they often address symptoms rather than underlying root causes. An alternative to this type of thinking is systems thinking (DiBella & Nevis, 1998; Senge, 2006; Thornton et al., 2007). When thinking systematically, one is focused on the whole as opposed to isolated parts and is encouraged to study the interrelationships that exist between key variables. Senge (2006) stated this type of thinking is essential due to the ever-increasing complexity of today's organizations. He stated, "organizations break down, despite individual brilliance and innovative products, because they are unable to pull their diverse functions and talents into a productive whole" (p. 69). Organizational Learning Theory addresses systems thinking and can be a useful theory for seeing the interrelationships between carefully identified variables and for assessing reform implementation and sustainability. According to Alsbury (2008) a redefinition of the process and conditions of the organizational system is critical for implementation and sustainability of reform. One way to redefine the necessary processes and conditions of districts and schools is through a carefully designed monitoring system (Alsbury, 2008, 2012; Leithwood et al., 2006).

Leithwood et al. (2006) defined a monitoring system as a "concise description of what should be and a process to determine what is" (p. 6). A framework such as this can

be used to assist districts and schools when assessing reform implementation and sustainability (Alsbury, 2008, 2012; Leithwood et al., 2006). This study investigated the current conditions of reform implementation and sustainability of one district's mathematics reform effort. Data collected as part of this study aided in the identification of current strengths to reform implementation and potential barriers to future sustainability. A specific focus was on Organizational Learning Theory and on the use of a monitoring system as a framework for identifying the elements necessary for effective implementation and sustainability. The Organizational Assessment Survey designed and validated by Alsbury (2012), and based on Coburn's (2003) Theory of Sustainability and Organizational Learning Theory as articulated by Leithwood et al. (2006) was used in this study. By analyzing the survey data of two groups of teachers, organizational reform variables connected to implementation and sustainability of this particular reform effort were determined.

Theoretical Foundations

According to Banner and Gagné (1995), "understanding how and why organizations are the way they are is a prerequisite to learning how to manage or change them" (p. xiii). Organizations make changes when forced to do so by external factors such the environment and/or based on internal factors such as changes in policy, structures, and/or routines. According to Leithwood et al. (2006), "increasingly, leaders are expected to make decisions with their colleagues based on systematic and many would say, both 'objective' and 'transparent' evidence" (p. ix). An understanding of Organizational Learning Theory, Sustainability Theory, and the use of monitoring systems which identify the essential elements for successful and sustainable reform can

be utilized to help organizations take control of systematic reform efforts. A carefully designed monitoring system enables organizations to make decisions based on evidence rather than "hunches", "gut feelings", and/or" "anecdotal information alone" (Leithwood et al., 2006, p. ix). Alsbury (2012) stated that monitoring systems such as these serve as a model districts can use to track changes in supports and barriers to reform efforts. According to Leithwood et al. (2006), the monitoring system should have a strong conceptual framework. Through the use of a monitoring tool, districts can make informed decisions about next steps in reform efforts. This study was focused on the use of a monitoring tool developed upon an integration and adaption of Organizational Learning Theory (Leithwood et al., 2006) and Sustainability Theory (Coburn, 2003).

Organizational Learning Theory. Collinson, Cook, and Conley (2006) defined organizational learning as "ongoing learning in a deliberate manner with a view to improvements supporting the organizations goals" (p. 107). According to these researchers, organizational learning aids in the prioritizing of learning for all members of the organization. It also aids in the dissemination of learning and in collective inquiry. Organizational learning involves changing the organization's theories of action either by refining existing theories or by questioning shared assumptions and norms in order to reach new theories (Collinson et al., 2006).

Leithwood et al. (2006) addressed four interrelated elements in their articulation of Organizational Learning Theory. The first of the four elements is centered on the differences between individual learning and organizational learning. Organizational learning is not merely the sum of each individual's learning (Leithwood et al., 2006). Instead, organizational learning must be planned and coordinated. Senge (2006) stated

"Organizations learn only through individuals who learn. Individual learning does not guarantee organizational learning. But without it no organizational learning occurs" (p. 131). The second element of organizational learning as defined by Leithwood et al. (2006) is centered on the connection between development of understanding and changes in behavior that may or may not result from this understanding. According to these researchers, an increase in understanding does not necessarily lead to changes in actual behavior or classroom practice. On the other hand, many changes in behavior are not connected to learning and/or understanding. The third element of organizational learning focuses on two levels of learning: single-loop learning and double-loop learning. According to Leithwood et al. (2006), single loop learning is associated with low-level learning and double loop learning is associated with high-level learning. The fourth element of Organizational Learning Theory as articulated by Leithwood et al. (2006), is centered on the differences between first order change, or services directly provided to students, and second order change which typically involves changes to policy, systems, and organizational structures.

Sustainability Theory. According to Coburn (2003), it is often the case that successful reform efforts result in achievement gains over a short time frame and eventually diminish or disappear even though the reform may still be in place. This may be due to a lack of focus on the sustainability of reform efforts over time. Coburn's concept of scale can be helpful when looking at the elements necessary for sustainable reform. According to Coburn (2003), many researchers define scale as an increase in the number of teachers, schools, and districts involved in "scaling up" the reform or pushing the reform out throughout the organization. Coburn believes the concept of scale is, in

fact, undertheorized and contains much more than this narrow definition. She advocated for a reconceptualization of scale, defining scale in terms of four interrelated elements: *depth, sustainability, spread,* and *shift in ownership.* Coburn (2003) stated that each element must be addressed, in order to achieve sustainable reform. According to Coburn, *depth* involves the level at which the reform is implemented. *Sustainability* is related to the success of reform efforts over time. *Spread* involves the reform's reach to other teachers, classrooms, schools and districts and *shift in ownership* is associated with the shift from those overseeing the reform to those who are using reform practices.

Chapter Two of this dissertation provides additional detail about Organizational Learning Theory as defined by Leithwood et al. (2006) as well as Coburn's (2003) Sustainability Theory. Specifically, Chapter Two includes information about how these two theoretical constructs can be merged and adapted to create a monitoring tool that can be used to assess the implementation and sustainability of school- and district-level reform.

Research Questions

The following research questions were used to guide the construction of this study.

Question 1: What are the frequencies of responses as they relate to level of agreement, disagreement, or unknown for each item relative to effective reform implementation and potential sustainability as measured by the Organizational Assessment Survey?

Question 2: Does a statistically significant difference exist for specific items relative to level of agreement, disagreement, or unknown for elements on the

Organizational Assessment Survey between teachers who have differing levels of experience implementing the district's large-scale mathematics reform?

Hypothesis (Null) 1. There will be no statistically significant association between level of agreement, disagreement, and/or unknown for specific items on the Organizational Assessment Survey and teachers with differing levels of implementation experience specific to the district's large-scale mathematics reform.

Hypothesis (Alternative) 2. There is a statistically significant association between level of agreement, disagreement, and/or unknown for specific items on the Organizational Assessment Survey and teachers with differing levels of implementation experience specific to the district's large-scale mathematics reform.

Research Methods

School participants. This study focused on teachers involved with mathematics reform in a mid-sized school district in the Northwest. The Organizational Assessment Survey was administered to two groups of teachers. Group one was comprised of teachers with three years of implementation experience or less. Group two was comprised of teachers with four or more years of implementation experience with the district's mathematics reform.

Study instrument. Alsbury's (2012) Organizational Assessment Survey (OAS) was used to investigate potential variation relative to key reform variables between these two groups. This survey provided a quantitative description of trends and perceptions amongst the populations (Creswell, 2014). Survey results were used to identify current strengths to reform and potential barriers to long-term sustainability.

According to Alsbury (2012) "the Organizational Assessment Survey uniquely integrates proven organizational variables from pre-existing, validated assessment instruments that build upon the work of organizational, leadership, and reform theorists, for more successful implementation and sustainability of innovative reform in districts" (p. 13). Survey questions were written based on Leithwood's (2006) framework for organizational learning and Coburn's Theory of Sustainability (2003). They were initially developed from interview questions, which were used and validated in a study done by Alsbury in 2008. Questions were refined, adjusted, and validated again in a second study done by Alsbury in 2012.

Study procedures. The survey was given to primary teachers in the Fall of 2016. Survey responses were collected and analyzed to look for trends, strengths, and barriers to reform efforts. A secondary focus was on potential differences between teachers implementing the district's mathematics reform for three years or less as compared to those implementing the district's reform for four or more years. This study hypothesized differences in the reform variables identified between these two groups and pointed to an increase in the number of barriers identified for one group. An increased number of barriers identified for one group may indicate threats to continued reform implementation and sustainability of the district's mathematics reform.

Significance of the Research

This study was intended to add to the substantive research base on organizational learning and specifically to the work done by Leithwood, Leonard, and Sharratt (1998) and Alsbury (2008, 2012). According to Leithwood et al. (1998), the research base on organizational learning in schools has been limited. The synthesis of research done by

Leithwood et al. (1998, 2006) provided a valid and reliable framework with which to measure organizational learning and identifies key variables necessary for successful implementation of reform. Alsbury's research on organizational learning (2008, 2012) built on the research by Leithwood et al. (1998, 2006), providing further validation of Leithwood's framework for organizational learning. Additionally, Alsbury's Organizational Assessment Survey provided an instrument with which to measure both reform implementation and potential sustainability of reform efforts. By using this same survey instrument, this study purposed to add to the substantive research base associated with organizational learning and sustainability.

This study has practical significance, because it provided information to schools and school districts about systematic study and assessment of reform efforts based on a framework, which outlined the elements necessary for successful implementation of reform. A survey instrument based on empirical evidence and a theoretical construct can be used to focus districts and schools on the elements most essential, so that stakeholders can work to strengthen efforts and decrease potential barriers to reform implementation and sustainability.

Limitations of the Study

There were several potential limitations to this study. These limitations included the following: survey response rate, teacher bias, and researcher bias. The purpose of this research was to study reform implementation and sustainability as it relates to two groups of teachers. This process was reliant on teachers in the school district completing the survey. The process was also reliant on the sample size for each group being large enough. Survey participation was voluntary. The researcher put processes in place to

attempt to remediate for this potential limitation. If the sample size is too small, survey results may not be representative of the population.

The researcher is an employee of the district and has worked as both a teacher and an administrator for many years. The researcher was also a district trainer for this mathematics reform project for the first few years of implementation. This was a limitation. The researcher was aware of potential bias and worked to limit this bias when administering the survey and when interpreting and reporting results.

Teachers might have approached the survey with bias toward the researcher. As an employee of the district, the researcher's relationship with survey participants could have biased the way teachers responded to survey questions. In addition, it is possible that teachers approached the survey with bias toward reform. For example, teachers in the study district were implementing a new English language arts curriculum. Implementation of this curriculum had been a strain on primary teachers within the district. Administering the survey while teachers were implementing other reform efforts may have led to biased results reflective of other district dynamics as opposed to the mathematics reform.

Chapter Two

Literature Review

Introduction

Change is a reality for schools and school districts. To address change effectively, schools and districts must put processes in place that address the interrelated elements of the organization as opposed to isolated parts and pieces (DiBella & Nevis, 1998; Leithwood et al., 2006; Senge, 2006). By focusing on these interrelated structures, districts and schools are more likely to identify the essential elements of the reform effort, to address these elements as needed, and to identify potential barriers to reform. A focus on systems thinking is one way to address systematic reform and sustainability (DiBella & Nevis, 1998; Senge, 2006).

A monitoring tool can aid in the identification of reform elements and can be used to help districts plan for and assess reform implementation and long-term sustainability (Alsbury, 2008, 2012; Leithwood et al., 2006). According to Leithwood et al. (2006) a monitoring system describes what is and what should be. It is essential that this framework be centered on theory and research. In Chapter Two of this dissertation, two applicable theories are described. The first one is Organizational Learning Theory as defined by Leithwood et al. (2006). The second one is Sustainability Theory as defined by Coburn (2003). Both of these theories outline the essential elements of successful reform and name the variables that should be present within a potential monitoring system. This chapter critically analyzes four empirical studies, which highlight organizational learning.

Theoretical Frameworks

   Organizational Learning Theory. Leithwood et al. (2006) addressed four interrelated distinctions to Organizational Learning Theory. The first of these is the distinction between individual and organizational learning. According to Leithwood et al. (2006), individual learning and organizational learning are two different things. More specifically, organizational learning involves individual learning, but individual learning can take place without any impact on the organization as a whole (DiBella & Nevis, 1998; Leithwood et al., 2006). This is an important distinction when assessing district-wide and school-level change. According to researchers, both types of learning are important, however where individuals have brains and memories, organizations do not (DiBella & Nevis, 1998; Leithwood et al., 2006). According to Leithwood et al. (2006), organizations do have "cognitive systems", which permit "perception, understanding, storage, and retrieval of information" (p. 27). According to Collinson et al. (2006) these systems are multilevel. They depend on the learning of individuals, groups, and the organization as a whole. As teachers and principals move on, retire, change grade levels, etc., it is necessary that districts and schools have processes in place for storing and retaining the organizational learning that has taken place due to change efforts. Cognitive systems aid in the retrieval of the organization's collective memory (Leithwood et al., 2006). This collective memory is critical, if organizations want to retain learning in times of personnel turnover (Collinson et al., 2006; Leithwood et al., 2006). A carefully designed monitoring tool can be used to supplement organizational memory when assessing the implementation and sustainability of district-wide and school-level reform.

The second distinction made by Leithwood et al. (2006), is the distinction between an increase in understanding and potential changes in action or behavior. Even though learning may occur within the organization, there is no guarantee that behavior will change, as a result of this learning. In fact these authors state, "substantial additions to understanding may result in little or no behavior change" and/or "small amounts of behavior change frequently take place without triggering any new understanding" (p. 27). This may be further exacerbated by the many changes that districts and schools encounter. Behaviors change in response to perceived needs. Oftentimes, these changes happen in isolated classrooms with little to no thought to the impact on the organization. According to Leithwood et al. (2006), "excessive behavioral change in a turbulent environment causes the organization to lose its sense of direction" (p. 27). Furthermore, these authors stated that "this may lead to random drift in which little is either learned or accomplished" (p. 27). It is essential that districts and schools put processes in place to monitor and maintain organizational learning and to prevent random changes to behavior that may or may not lead to the success and sustainability of reform efforts. The coordination between district office personnel and principals is key to this shift in teacher behavior and classroom practice. A monitoring system keeps key stakeholders focused. First, the monitoring system ensures that district office staff and principals are working toward the same goals. A monitoring tool helps to tighten connections between district office personnel and principals, so that reform is encouraged in the school buildings, where much of the change is likely to occur. Second, the monitoring system helps to ensure that goals are closely defined. Third, the monitoring system maintains a focus on evaluation of reform efforts.

The third distinction is associated with levels of learning (Leithwood et al., 2006). These researchers address the differences between "low-level or single-loop learning" and "high-level or double-loop learning" (p. 28). Researchers define single-loop learning as additional learning about existing structures and practices (Collinson et al., 2006; DiBella & Nevis, 1998). According to DiBella and Nevis (1998), single-loop learning is "learning more about what we already do or know" (p. 14). According to Leithwood et al. (2006), single-loop learning is associated with modest increases in understanding and may result in little to no behavior change.

Researchers have referred to double-loop learning as a reevaluation of existing practices and the new learning associated with the shifting of priorities and/or the learning of new policies and practices (Collinson et al., 2006; DiBella & Nevis, 1998). According to Collinson et al. (2006), double-loop learning might be a reevaluation of district priorities and new learning based on this reevaluation. Double-loop learning often results in increased understanding and lasting changes in behavior (Leithwood et al., 2006). These changes tend to be more substantial and sustainable. DiBella and Nevis (1998) stated that many believe double-loop learning to be superior to single-loop learning. These researchers stated that both types of learning are valuable and that an evaluation of the level of learning required is likely important. According to Leithwood et al. (2006), it may benefit the organization to consider these differences and to work toward double-loop learning when initiating change efforts.

Finally, Leithwood et al. (2006) addressed the differences between first-order change and second-order change. First-order change is associated with changes in the services that are provided directly to students and includes changes to curriculum and

instruction. Second-order change is associated with large-scale reform and includes changes to structures, policies, and norms. According to Leithwood et al. (2006), "first order changes are almost never successfully institutionalized in the absence of complementary second order changes" (p. 18). Additionally, second-order change either supports or weakens the services, which are provided to students. When second-order changes are made, they are often piecemealed. Districts and schools fail to look systematically at all of the interrelated components and therefore neglect to address crucial elements that must be attended to in order to ensure successful reform implementation and sustainability. Many of the changes required, due to federal and state mandates, are second-order changes and may have little to do with curriculum and instruction. As a result, second-order changes may actually distract from the learning going on in classrooms. One way to prevent such distraction is for districts to plan for systematically collected information. By doing this, districts can study the status of change efforts and work toward affects that have the greatest impact on students and on instructional practice. According to Leithwood et al. (2006), "the local learning required for successful school reform on a large scale is aided by feedback about the consequences of innovative practices and information about remaining obstacles to change" (p. 3). A monitoring tool helps organizations to identify essential elements of focus. Districts can use a monitoring tool to evaluate each element and identify strengths and barriers to reform efforts. According to Alsbury (2004), "a monitoring system not only provides valuable feedback loops to the organization implementing the program reform, but additionally may inculcate within the organization a habit for the systematic collection of, reflection upon, and subsequent use of cogent data" (p. 1).

Sustainability Theory. According to Coburn (2003) the issue of scale is one of the central challenges for school systems. Additionally, traditional definitions of scale have been limited to the spread of reform across schools or districts. Coburn (2003) stated that this limited view of scale does not adequately address the complexities involved with the scope of reform efforts. It neglects elements such as the challenges associated with implementation and the sustainability of change across multilevel systems, which often have multiple, shifting priorities. According to Coburn (2003), "it is the simultaneity of these challenges, in all their complexity, that makes the problem of scale fundamentally multidimensional" (p. 3). Coburn (2003) stated that the way scale is defined is important, because the definition influences how reform strategies are crafted and studied. She used a synthesis of empirical research to articulate a multidimensional definition of scale and one that might be useful when studying sustainability of change. Coburn (2003) defined scale in terms of four dimensions: *depth, sustainability, spread*, and *shift in ownership*.

Coburn (2003) defined *depth* of scale in relation to the level at which the reform is implemented, which requires explicit attention to the "nature and quality of the change" (p. 4). Specifically, she stated that reformers must focus on deep change. They must focus on changes that alter beliefs such as: assumptions about student learning, the description of subject matter, student expectations, and elements of effective instruction. She also addressed the need to focus on social norms and states these norms include teacher and student roles, patterns of classroom talk, and the ways in which people treat each other. In addition, she stated that a focus on underlying pedagogical principles is also essential. According to Coburn (2003), it is "important to look beyond the presence

or absence of specific materials or tasks to the underlying pedagogical principles embodied in the ways teachers engage students in using these materials and tasks" (p. 5). Coburn (2003) stressed that reform can happen at any depth and that a focus on measures of classroom change, beliefs, norms, and pedagogy can aid in a deeper understanding of the level of change. Reform efforts, which focus on *depth*, might potentially aid in long-term sustainability. A carefully structured monitoring system serves as a valuable tool for ensuring that reform efforts are addressed at an adequate depth.

The second element of scale, according to Coburn (2003), is *sustainability*. Coburn stated that, "most discussions address issues of sustainability and scale separately, obscuring the way that scale, in fact, depends upon sustainability" (p. 6). Scale has meaning over time, if it can be sustained. Coburn (2003) emphasized the need for increased dialog about the challenges to sustainability and strategies for providing schools with the tools necessary for sustainable reform. She stressed this is even more essential, in the absence of adequate funding and/or resources and is especially true for external reform movements and when districts and schools are dealing with competing reform efforts. According to Coburn (2003), teachers are better able to sustain reform if there are supports in place at multiple levels within the system. Supports might look like the presence of supportive learning communities, continuing opportunities to learn, knowledgeable and supportive leadership, connections to other schools that are involved in the reform, and alignment between district policy and reform. A monitoring system provides the structure with which to guide the dialog between people involved in reform efforts.

Spread is the third element of scale and most closely matches the traditional definition of scale. *Spread* relates to how much the reform reaches other teachers, classrooms, schools, etc. Coburn (2003) suggested that it is not enough to focus simply on *how far* the reform has spread. Instead, it is essential that reformers look at *what* is spread. Specifically, Coburn stated, "scaling up must involve more than the spread of activity structures, materials, and classroom organization; it must also involve the spread of underlying beliefs, norms, and principles to additional classrooms and schools" (p. 7). She also stated that reform principles must become "embedded in school policy and routines", because "teachers and schools are more likely to be able to sustain and deepen reform over time when school and district policy and priorities are compatible or aligned with reform" (p. 7). This may change how the district or school looks at *spread*. For example, districts have traditionally looked at how best to provide support to teachers during reform efforts. According to this definition of *spread*, the district may need to take on a bigger role than merely a supportive one. Instead, the district may need to take on a strategic role, in which it is the center for reform efforts. According to Alsbury (2008), "the district itself can affect spread by developing a common set of values and principles within all of the school staff and leadership" (p. 180). This may be key to sustainability, because this practice shifts the leadership for the reform to the district and school level, which may lead to more meaningful reform practices.

The final element of scale is *shift of reform ownership*. According to Coburn (2003), ownership must shift from the external reformer to those implementing the reform effort, because these people have the greatest capacity to sustain reform practices. Some refer to reform ownership as "buy in". According to Coburn (2003) and Alsbury

(2008), reform ownership must go deeper than the concept of buy in. Instead, reform ownership requires that a shift be made in the knowledge of reform practices and in the authority for implementing the reform. Alsbury (2008) stated that this practice "goes to the heart of systematic measures that work to change a district's organizational structure" (p. 180). Coburn (2003) believed ongoing professional development is needed to shift the ownership for reform from those leading the reform to those implementing reform practices.

According to Alsbury (2008), "all components of scale are necessary if reformers hope to maintain the initial student achievement gains over time" (p. 180). Alsbury (2008) provided a list of district-level behaviors that take the elements of scale into consideration. If districts want to include elements of scale into reform efforts, they can (a) ensure leaders and teachers understand the pedagogy behind, and the nature for, the reform; (b) create opportunities for on-going professional development; (c) find ways to maintain district responsibility for continuation of reform efforts, which can be done through: allocation of resources, district-wide policy, hiring practices, strategic scheduling of time, and building-wide procedures and practices; and (d) facilitate school-level decision making, which involves teacher leaders and key stakeholders who are directly involved with reform efforts. By doing these things, district and building administrators are more likely to ensure *depth*, *spread*, *sustainability*, and *shift in reform ownership*.

Organizational Learning and Reform

According to Higgins, Ishimaru, Holcombe, and Fowler (2011), "understanding how to create school systems that can themselves be 'learning organizations' to improve

instruction and enhance student achievement has remained an elusive phenomenon" (p. 68). The conception of schools as learning organizations is a promising approach to the continuing demands of restructuring, however, the empirical evidence needed to shape this process is thin (Leithwood et al., 1998). The elements of focus often change depending on the researcher. In some cases, researchers have focused on the structural components required for organizational learning. In other cases, the focus has been on the social elements needed. Still others focus on a more comprehensive picture of organizational learning using multiple elements including the combination of structural elements and social elements. Identification of the key components is an essential next step in the study of organizational learning and sustainability. The next section contains a review of empirical research related to organizational learning and sustainability. The goal is to outline the elements related to successful reform implementation and sustainability of reform efforts.

Organizational learning in an urban childcare center. The first study under consideration is a case study of one early education and childcare center located in an urban, economically depressed region of southern New England. The center served approximately 350 families, most of which represented ethnic and racial minorities. Ninety percent of the families received state assistance. The center provided childcare for children as young as six weeks old. Early-morning and after-school care were also provided to school age children. Kindergarten classes ran at teacher/student ratios of about 1 to 13. The majority of classroom aids were working for minimum wage and were living below the poverty line (Austin & Harkins, 2008).

Researchers were interested in measuring change in organizational learning practices after the completion of a yearlong intervention designed to help the center become a learning organization. Researchers had three objectives: (a) to determine whether traditional measures of organizational performance might be associated with improved organizational learning, (b) to identify the work characteristics that were critical for supporting organizational learning, and (c) to study organizational learning with socio-economically disadvantaged and at-risk populations (Austin & Harkins, 2008).

The yearlong consulting intervention was based on the results of an initial needs assessment. Researchers collected 27 confidential interviews from teachers and administrators (approximately 47% of the center's employees). The initial needs assessment indicated that staff members hoped for center improvement in the following dimensions: trust, respect, collaboration, teamwork, support, and participative decision-making (Austin & Harkins, 2008). During the yearlong intervention, researchers worked with center staff on climate of the community, the elements of productive leadership, and specific management practices.

The theoretical framework for this study was organizational learning. According to Austin and Harkins (2008), however, "the field has not yet arrived at an agreed upon operational definition" (p. 108). Additionally, they stated, "early findings do appear to support the premise that empowerment, openness, team member dialogue, supportive risk-taking environments, appreciative inquiry and distributed leadership facilitate learning" (p. 108) and that organizational learning should be associated with

organizational climate. Austin and Harkins (2008) used a case study approach to measure the following research questions:

1. To what extent did employees perceive the center to be more of a learning organization post intervention?

2. Did critical "outcomes" for the center – such as morale and turnover rates – improve or deteriorate over the course of the intervention?

3. How did employees' perceptions of various climate dimensions (such as supportive leadership and participative decision making) change?

4. To what extent were changes in organizational learning and morale associated with changes in school climate (p. 112-113)?

Researchers surveyed employees pre- and post-intervention on measures of organizational learning, school climate and morale. Sixty-one employees participated in the study. Six were male and 55 were female. The mean age of participants was 35 years (with a range of 20-66 years). About 38% of study participants were of Caucasian or European descent, 23.0% were Latin American or Hispanic, 13.1% were either African American or Cape Verdean, 3.2% were of Asian descent, and 26% did not disclose their ethnicity. Forty-four employees completed the survey pre-intervention and 45 completed the survey post-intervention. 28 employees completed both surveys (pre-intervention and post-intervention) (Austin & Harkins, 2008).

Researchers used three measures of organizational learning to assess change from pre-intervention to post-intervention. They used two scales from the Team Climate Index (TCI) by Anderson and West (1998), one on participative safety and another on task orientation. They also used the Learning Organization Assessment (LOA) by Kline and

Saunders (1998). The full TCI contains five scales and focuses on climate that supports

innovation. In order to keep the overall survey to a manageable length, researchers opted

to use only the scales on participative safety and task orientation. Participative safety

measures the extent to which the center environment is non-threatening, characterized by

trust and support, and whether or not the environment motivated and/or reinforced

involvement in decision-making (Austin & Harkins, 2008). This scale is comprised of

eight items on a five-point scale (1 = strongly disagree and 5 = strongly agree).

Researchers reported that these items had high reliability (alpha = .89). TCI task

orientation measures the groups' commitment to excellence in task performance along

with a climate that supports improvements to policies, procedures, and methods. Task

orientation is comprised of seven items on a five-point scale (1 = to a very little extent, 5

= to a very great extent). Researchers reported that the TCI task orientation scale had high

reliability (alpha = .92). Three scales from the TCI were not measured in this study,

including: vision, support for innovation, and interaction frequency (Austin & Harkins,

2008).

The Learning Organization Assessment (LOA) was also used to assess

organizational learning from pre- to post-intervention (Austin & Harkins, 2008). This is a

36-item, self-report survey, which uses a five-point rating scale (1 = Not at all, 5 = To a

very great extent). Researchers reported, "the psychometric properties of this measure

have not been examined in previous research" (p. 114). One might question the reliability

and validity of this particular instrument, especially as it relates to school settings. This is

one potential drawback to use of the LOA. Another potential drawback is that the items

on the LOA were intended for business audiences and were of high readability (Flesch-

Kincaid grade level of 12.0). Researchers attempted to remediate for this by revising items so that they were all readable at the ninth grade level (Austin & Harkins, 2008). The readability might have been a challenge for center staff. This could be a potential source of bias. Researchers reported the LOA "offers a more global approach to assessing the extent to which workplaces behave as learning organizations" (p. 114). They also reported that the survey is widely available to managers, which could be a benefit.

Researchers also assessed organizational performance as it related to turnover rate, morale, and climate (Austin & Harkins, 2008). Specifically, turnover was calculated as the percentage of staff members who left over the course of a given year. Researchers measured morale and climate with the School Organizational Health Questionnaire (SOHQ) by Hart, Wearing, Conn, Carter, and Dingle (2000). This questionnaire measured morale as defined by the extent to which employees felt there was pride, energy, enthusiasm, and team spirit at the center. The morale scale from the School Health Questionnaire consists of five items on a Likert-type scale (1 = strongly disagree, 5 = strongly agree). According to Austin and Harkins (2008), internal consistency for this scale was reported to be 0.86. Climate was also measured with the SOHQ and was associated with the following variables: appraisal and recognition, curriculum coordination, effective discipline policies, excessive work demands, goal congruence, participative decision making, professional growth, professional interaction, role clarity, student orientation, and supportive leadership. These 11 scales contained three to seven items each, all of which were rated using a five-point, Likert-type scale (1 = strongly disagree, 5 = strongly agree). Researchers reported the alpha coefficients for all 12 morale and climate scales ranging from 0.71 to 0.90 (Austin & Harkins, 2008).

Researchers used the Wilcoxon signed rank test to assess changes in organizational learning. According to Austin and Harkins (2008), positive changes were observed for the Learning Organization Assessment ($Z = 2.50$, $n = 28$, $p < 0.01$). It is difficult to get a sense of which LOA items were associated with positive change, because the elements being measured were not reported. Identification and description of these elements might have aided in additional analysis of the elements associated with and/or not associated with organizational learning. Researchers reported positive changes for both task orientation ($Z = 2.64$, $n = 27$, $p < 0.01$) and for participative safety ($Z = 1.87$, $n = 28$, $p < 0.05$). According to Austin and Harkins, these results indicated that center employees perceived positive changes in organizational learning and specifically that employees perceived positive changes "in everyone's ability to maintain standards of excellence and to create a safe environment for participation" (p. 116).

Researchers also used the Wilcoxon signed rank test to assess changes related to morale ($Z = 2.16$, $n = 27$, $p < 0.05$) and climate. They reported positive changes for professional interaction ($Z = 2.46$, $n = 28$, $p < 0.01$) and supportive leadership ($Z = 2.07$, $n = 27$, $p < 0.05$). In addition, they reported positive, but minimal changes to participative decision making ($Z = 1.04$, $n = 28$, $p < 0.08$), school role clarity ($Z = 1.74$, $n = 27$, $p < 0.08$), and curriculum coordination ($Z = 1.92$, $n = 26$, $p < 0.06$). Finally, they reported no significant change for goal congruence, reduction of work demands, effective discipline policies, student orientation, appraisal and recognition, and professional growth (Austin & Harkins, 2008).

Because researchers did not report on the 36 items from the Learning Organization Assessment (LOA), it is difficult to analyze changes in organizational

learning. It does appear that there may have been some positive changes associated with morale and climate. Without an explicit link to the Learning Organization Assessment, it is difficult to ascertain whether these social conditions were associated with changes related to organizational learning. It is also difficult to get a sense of the depth or spread of such learning. In this particular study, more information is needed to determine whether learning took place and if so, to what extent. A survey tool such as the Organizational Assessment Survey by Alsbury (2012) might have aided in a more comprehensive analysis of organizational learning in this childcare center.

A synthesis of research from three independent studies. The second empirical review comes from a synthesis of three independent studies on the conditions that foster organizational learning in schools. This synthesis includes studies done by Leithwood, Jantzi, and Steinbach (1995), Leonard (1996), and Sharratt (1996). Each of the three studies used the same theoretical framework and qualitative design. Researchers also analyzed the data in comparable ways (Leithwood et al., 1998).

The theoretical framework used for these studies came from an extensive review of organizational learning in non-school settings and was based on the work of Cousins (1996) and Leithwood and Aiken (1995). The theoretical framework includes information about the nature of organizational processes, causes and consequences of such processes, and forms of leadership. The theoretical framework also emphasizes the importance of collective learning as opposed to/or in addition to individual learning (Leithwood et al., 1998).

According to these researchers there are five sets of variables that make up organizational learning and the relationships among these variables is complex. The first

category associated with organizational learning is the stimulus for learning. According to Leithwood et al. (1998), organizational learning must be prompted by a felt need or perception of a problem, which leads to a collective search for a solution. The second variable associated with organizational learning comes from out-of-school conditions including mandates from the Ministry, district initiatives, and/or conditions within the community. The third variable comes from in-school conditions and includes the school's mission and vision, building culture, decision making structures, school policies, distribution of resources, etc. The fourth variable associated with organizational learning is school leadership. This includes practices by those in formal leadership roles, including principals. According to Leithwood et al. (1998), this includes those "who influence the nature and extent of efforts by school members" (p. 249). The fifth variable is associated with outcomes related to change. This might include shifts in individual and/or collective understanding, changes in skills and practices, and/or shifts in commitment.

In all three studies, researchers used a qualitative, multi-case design. Researchers referred to these studies as framework driven (Leithwood et al., 1998) and based on a body of relevant research. Although this research was not specific to school settings, it did help to delineate key variables for organizational learning and the relationships among these variables. According to Leithwood et al. (1998), use of a prior framework increased the likelihood that meaningful comparisons could be made between identified variables. Researchers also reported that the multi-case study design increased the external validity of the research.

School sites were selected for the three studies based on two criteria. First, the sites had to be associated with a sufficient need for organizational learning. According to

Leithwood et al. (1998), it is assumed that organizational learning is necessary in almost all schools but the nature, direction, speed, etc. likely varies extensively. Second, the conditions associated with organizational learning needed to vary significantly so that researchers could discriminate between the associations among variables and how they foster, inhibit, or have no effect on organizational learning. In total, researchers studied 14 schools and 111 teachers.

Study One was done by Leithwood et al. (1998) and included six schools and 72 teachers. Four of the school sites were selected for this study based on previous research. The other two sites in the Leithwood et al. study were selected based on recommendation and because they had a reputation for making substantial progress toward restructuring. All six schools were involved in organizational change as required by the Ministry. The six schools represented the K-12 spectrum and included one primary school, one elementary school, one junior secondary school, two secondary schools, and one senior secondary school. Principals nominated up to 12 teachers from each school site to participate in the interview process. According to Leithwood et al. (1998), the teachers selected were broadly representative of the population in terms of curriculum taught, years of experience, gender, and expertise.

Researchers reported that selection of school sites for the second and third studies was slightly constrained due to geographic location and/or the stimulus for organizational learning (Leithwood et al., 1998). The second study was done by Leonard (1996) and included three schools and 15 teachers. The schools selected for Study Two were involved in a Newfoundland school council pilot. Like Study One, teachers selected were broadly representative of the study population. The third study was done by Sharratt

(1996) and included five schools and 24 teachers, who were selected on a volunteer basis and were required to have the necessary computer hardware and software associated with the study on electronic resources (Leithwood et al., 1998).

According to Leithwood et al. (1998), interview data for Study One was based on an instrument consisting of 28 questions. All 28 questions were related to the components from the study's conceptual framework. This same instrument served as the basis for Studies Two and Three. Teacher interviews lasted approximately 50 minutes. Principals were also interviewed in Studies One and Two. Researchers used a similar instrument for principal interviews, which lasted approximately 90 minutes. Interviews were tape recorded and transcribed. They were then analyzed using a multi-stage analysis. In stage one, researchers identified idea units, which corresponded to the five categories from the theoretical framework (stimulus, out-of-school variables, in-school variables, leadership, and reform outcomes) (Leithwood et al., 1998). In order to ensure internal validity, researchers used multiple coders to triangulate the data. They also left explicit "audit trails" (Leithwood et al., 1998, p. 252). Specifically, data were analyzed by at least two researchers (three researchers for Study One). A variation of this same coding process was used for Studies Two and Three.

In the second stage of analysis, interview data was recoded, based on the explicit links/associations made between two or more variables. These links helped researchers see possible relationships between the categories and variables in the conceptual framework. Because the number of teachers varied for each school site, researchers reported the average number of associations per teacher. This allowed for comparisons between school sites (Leithwood et al., 1998). Researchers reported that although this

process enabled them to see the average number of associations between variables, they were not able to see why variables were linked.

Researchers reported on the relationships among the five categories and corresponding variables in the conceptual framework. They examined the variables, looking for those that had the greatest impact on organizational learning. Finally, they studied the extent to which these relationships were dependent on specific contexts (Leithwood et al., 1998). Based on a synthesis of the three studies, researchers identified nine individual variables within the larger categories from the conceptual framework. Three variables were associated with the out-of-school category including: district, community, and Ministry. Five variables were associated with the in-school category including: vision, culture, structure, strategy, and policy and resources. School leadership was treated a one independent variable (Leithwood et al., 1998). Table 2 outlines the five components of the conceptual framework along with the nine variables associated within the different components. The numbers in Table 2 denote the relative strength of influence for specific variables. Based on the synthesis of research from these three studies, researchers reported the following: the stimulus for learning has a direct influence on organizational learning processes, which have a direct influence on organizational learning outcomes. Out-of-school, in-school, and school leadership variables are both directly and indirectly associated with organizational learning processes (Leithwood et al., 1998).

Researchers analyzed the mean percentages across the three studies and reported on the relative influence of specific variables with regards to either direct influence or indirect influence on organizational learning. They reported the percentage ranking of

each variable. This ranking made it possible for researchers to see which variables were strongly influential and/or which ones had less impact on organizational learning. Specifically, they found that the district (13.8%), school leadership (11.4%), and school culture (8.3%) had strong influences on organizational learning. According to Leithwood et al. (1998), they were "cited as influential much more frequently than were the remaining 6 variables" (p. 257), which were ranked as: policy and resources (4.7%), school structure (4.7%), community (4.3%), Ministry (4.1%), school strategy (3.3%), and vision (1.9%).

Of the variables associated with strong influence, researchers reported on specific categories and/or features within the variables that were associated with organizational learning (OL). As mentioned earlier, the district was reported more frequently as a variable strongly influencing organizational learning. Teachers reported that the district was associated with five categories and 36 specific features. Mission and vision was mentioned as a feature associated with the district. Researchers noted that mission and vision was only fruitful, if the vision was "clear, well understood, and meaningful" (Leithwood et al., 1998, p. 260). They also noted that the mission and vision needed to engender commitment and the need for continuous professional growth. A collaborative and harmonious culture was also considered to be an important feature of the district. According to Leithwood et al. (1998), this type of culture fostered a shared sense of community and was especially effective when there was interaction between schools. Shared sense of community was fostered through clear communication and professional development and was increased when disputes were settled in a professional manner. A third feature of the district was associated with district structure. Organizational learning

was fostered when school staff members participated in shaping both district- and school-level decisions (Leithwood et al., 1998). Participative decision-making taught those involved about the wider issues in the district and/or school and increased collective problem solving capacity. Researchers also reported that shared decision making aided in the creation of solutions specific to the needs of the school's context. District policies and resources were also identified as influential and included elements such as release time for common planning, professional development, and exposure to knowledge sources such as lead teachers and/or consultants. Researchers found professional development especially helpful when districts could create a "critical mass of expertise" (p. 262) by sending multiple staff members to be trained from a single building (Leithwood et al., 1998).

A second variable shown to be influential on organizational learning was school culture. Teachers frequently reported that influential cultures were collaborative and included norms for support, as well as shared respect for ideas. Teachers reported that they were willing to take risks when attempting new practices. They also reported that they felt more supported when they received honest and candid feedback, when there were shared celebrations for success, and when next steps were focused on the needs and achievements of students (Leithwood et al., 1998).

A third variable shown to be influential on organizational learning was school structure. Teachers reported that school structures were more influential when they allowed for shared decision making through processes such as planning meetings, frequent formal and informal problem solving sessions, flexible time schedules, and regularly scheduled professional development. Teachers also reported school structure to

be influential when they were involved in cross-department teams, integrated curriculum teams, and team teaching. Finally, closer proximity to staff was viewed as influential (Leithwood et al., 1998).

The fourth variable frequently reported to be influential on OL was policies and resources. Teachers reported that professional development was an essential resource when linked to change initiatives. They also reported using colleagues and professional libraries as professional development resources. Relevant curriculum resources, access to computer hardware and software, and access to technical and program assistance was also frequently reported as influential to organizational learning (Leithwood et al., 1998).

The fifth variable frequently reported as influential was leadership. According to Leithwood et al. (1998), several features were associated with influential leadership. Teachers reported leaders to be influential when their practices were associated with the identification and articulation of a clear vision for the future. Second, teachers reported leaders as influential when they fostered group goals. Researchers reported that this practice promoted cooperation among staff members (Leithwood et al., 1998). Teachers reported that influential leaders conveyed high performance expectations, including expectations for excellence, quality, professionalism, professional growth, and high performance for staff. Teachers reported that leaders were influential when they encouraged creativity while trying new strategies. Third, teachers reported leaders to be influential when they provided appropriate models. This included practices such as working hard, having lots of energy, being genuine, modeling openness, having good people skills, and showing evidence of learning by growing and changing (Leithwood et al., 1998). Fourth, teachers reported leaders to be influential when they provided

individualized support. This included respect for individual needs and concern about

personal feelings. Support also included individualized professional development, release

time, scheduling of help, information sharing, participative decision-making, and

collection and distribution of information. Teachers reported that moral support was

influential. They reported that principals were most influential when they worked to meet

the needs of staff and when they showed an eagerness to listen. They also reported that

principals were influential when they were fair, open and sympathetic, and when they

encouraged staff members to take risks. Sixth, leaders were reported to be influential

when they provided intellectual stimulation. According to Leithwood et al. (1998),

influential principals challenged teachers to reexamine assumptions and to rethink

previous practice. They also passed on information and knowledge sources and provided

professional development. Seventh, influential principals built productive school cultures

by encouraging collaboration and assisting in the creation of shared norms, values and

beliefs that were consistent with improvement efforts. Principals were also influential

when they put the needs of students first and when they built collaborative communities.

The building of collaborative communities was associated with honest and open

communication, collegiality, and flexibility. Principals were more influential when they

were perceived as treating staff with respect and with treating teachers as professionals.

Additionally, principals were influential when they made hiring decisions that were

consistent with the school's philosophy and culture and when they encouraged parental

involvement (Leithwood et al., 1998). Lastly, influential leadership was associated with

structuring the school to enhance participative decision making. This included involving

all relevant stakeholders. Teachers reported principals to be more influential when they

encouraged participation, were actively involved, and when they organized opportunities for collaboration centered on reform practices. Teachers also reported that principals were more influential when they shared leadership by having teachers lead professional development and/or staff meetings and when they facilitated collaboration by making necessary changes to timetables, the physical space, and/or the arrangement of leadership positions designed to foster organizational learning.

The synthesis of research based on these three studies provided a comprehensive picture of the variables involved in organizational learning for schools. This research was used to guide the next two empirical studies. Because change efforts are inevitable, costly, and difficult, it is essential that districts and schools work to ensure successful reform implementation and sustainability. One way to better ensure successful reform and to work toward long-term sustainability is through the use of a monitoring tool, which guides districts as they monitor and evaluate all of the elements necessary for successful reform. A tool, such as this, can help districts to (a) assess the elements of reform efforts, (b) identify potential barriers to implementation and future sustainability, and (c) address these barriers.

Alsbury (2012) created an Organizational Assessment Survey (OAS) that can be used as a monitoring tool for reform implementation and sustainability. The Organizational Assessment Survey is based on elements of Organizational Learning Theory as articulated by Leithwood et al. (2006) and Coburn's Theory of Sustainability (2003). Two empirical research studies can be used to analyze the validity of the Organizational Assessment Survey and to validate use for future studies on reform implementation and sustainability.

Crockett School District. The first study was conducted at Crockett School

District, a rural school district, located in the mid-west. The district had recently

implemented a program called the Science Writing Heuristic (SWH). According to

Alsbury (2008), the initial implementation was led primarily by the Assistant

Superintendent/Curriculum Director. The Crockett School District staff remained

relatively stable throughout the course of implementation. Although the program was

voluntary, all teachers had chosen to participate, had received training, and had been

observed and coached throughout the pilot years. Alsbury (2008) stated, teacher use of

the Science Writing Heuristic varied, both in terms of frequency and success and teachers

embraced the program to varying degrees. This may be evidence that system-wide depth

of content and shift in ownership had not yet occurred in Crockett School District.

However, recent ITBS scores indicated that the program was likely associated with gains

in student academic achievement.

According to Alsbury (2008), "this study purposed to analyze the presence, and

change over time of systematic leadership and organizational variables identified as

necessary for successful and sustainable reform" (p. 182). Researchers used qualitative

research methods, which included interviews, observations, and key document collection.

According to Alsbury (2008), research methods (interview design, data collection, and

analyses) were based on the components in Leithwood et al.'s (2006) monitoring system,

which included mission and goals, school and district culture, management and

leadership, structure and organization, decision-making, policies and procedures, and

community relations. Research methods were also based on Coburn's principles for

sustainability (*depth, spread,* and *shift in ownership*). In essence, these components

served as a tool for identifying the leadership and organizational variables necessary for successful and sustainable reform.

Researchers studied the sustainability of SWH practices in the district's middle school and high school. Participation in the study was voluntary. Because all science teachers chose to participate, it could be assumed that the study was representative of the population. According to Alsbury (2008) researchers interviewed "all school personnel involved in providing leadership, training, and implementation of the SWH program, including the superintendent, assistant superintendent/curriculum director, middle school principal, high school principal, high school assistant principal, all middle and high school science teachers, the project designer/trainer and two research assistants" (p. 182). In an attempt to control for potential variability, researchers developed and used an interview protocol, which included questions and follow-up probes. This protocol was pre-tested and then used by two interviewers. This was done to increase the internal validity of the interview tool.

Although researchers attempted to control for all of the variables, they did report that respondents became aware of and worried about the potential for their responses to be interpreted by their supervisors. This was due in part to the size of the research sample. This may indicate problems with internal validity. If respondents changed their responses, as a result of worrying about what their supervisor might think of them, this could have biased the results. According to Alsbury (2008), it did not appear this affected the results. He stated specifically "participant responses did not indicate any reluctance in sharing concerns or problems regarding the school district, leadership, or the SWH program" (p. 182). However, this is something with which to be aware.

Researchers also indicated the study might have led to changes in principal practice during the study period. This could be a threat to internal validity. Alsbury (2008) reported at one point in the study, it became clear that principals were lacking in knowledge relative to the SWH program. Shortly after this data surfaced, principals were trained in these practices. This may have indicated that researchers did not have full control of study variables.

In addition to interviews, researchers also observed leadership team meetings and district-level trainings. They used an audio recorder and transcribed this data. By recording and transcribing the data, they could ensure that the data was accurate. They also collected documents such as school board and meeting minutes, district budgets, strategic plans, district policy, and newsletters to families and community members. According to Alsbury (2008), this data was important to the study because "documentary data provided further triangulation between interview and observation data and also critical validation" (p. 182-183). Due to triangulation between research methods, researchers were able to get a clear picture of the leadership activities throughout the study period. Triangulation between these three sources aided in construct validity, ensuring that documentary data, interview data, and observation data were closely connected and were representative of the construct being measured.

According to Alsbury (2008), research data was analyzed and coded using a checklist of Coburn's (2003) principals of sustainability (*depth, spread,* and *shift*) and Leithwood et al.'s (2006) critical systems, processes, and conditions. Two researchers studied the interviews, documents, and transcribed materials. They coded the information separately and then compared their results. If they came across information that was

coded differently, they discussed placement and negotiated for best fit. This process

helped ensure inter-rater reliability. Researchers also used an emergent thematic analysis

for additional themes that did not fit within the initial checklist. Ultimately, the checklist

of Coburn's (2003) principals and Leithwood et al.'s (2006) critical systems, processes,

and conditions provided a valid, research-based framework whereby responses could be

organized. This framework increased the level of construct validity for this study,

because it ensured that responses were closely connected to the different elements within

the framework. In addition, researchers were able to add to the validity of the instrument,

by using the emergent thematic analysis. This process ensured relevant data was not

missed.

Coding the data enabled researchers to see the frequency of responses within each

category and to compare responses across groups. For example, they could compare

teacher responses with principal responses and could look for similarities or differences

in the frequency of responses for particular categories. This provided researchers with

information about specific areas within the framework. Because responses were coded in

this manner, research was directly aligned to theory. Researchers coded the data into a

total of 91 descriptors. Seventy-five descriptors were related to Leithwood et al.'s (2006)

critical systems, processes, and conditions and 16 descriptors were related to Coburn's

(2003) principals of sustainability.

Use of the monitoring tool aided in the identification of disconnects between

specific members of the organization. For example, Alsbury (2008) discovered some

disconnects between different groups within the organization. He stated, "science

teachers reported the presence of only 15% of the necessary reform conditions and

principles while administrators identified the presence of 69% of these within the system"
(p. 184-185).

Analysis of data also showed a disconnect between the number of responses
indicating that reform principles were missing from the system. For example,
administrators reported that 1.4% of reform principles were missing from the system and
teachers reported that 6.6% of reform principles were missing. Alsbury (2008) suggested
some possible reasons for this disconnect. First, it is possible that administrators might
believe that they have facilitated the understanding of key elements, but teachers may not
have a clear understanding of them. Second, teachers may be more focused on what
happens in their classroom environment and less focused on what happens at the district
or systems level. Third, teachers may not have mentioned key elements due to (a) a lack
of importance or (b) a lack of focus. Perhaps the elements are difficult for teachers to
understand. In an attempt to control for this, however, researchers accepted and coded
responses even when stated differently than in the checklist. Questions and probes were
also written, so that they would be understandable by teachers. Alsbury (2008) reported
although it was arguable that teachers may not have understood the elements, it was
probably not likely. Could this disparity be related to how reform efforts were
communicated to staff? Alsbury reported that teachers felt the need to implement SWH
reform efforts due to testing and accountability measures. Although the district may have
seen this reform as a change in mission and vision, district administrators may have
communicated the need for reform as a necessary change relative to academic outcomes.
This may have indicated that members of the organization viewed reform from different
perspectives. Is it possible that administrators had a systems perspective and teachers had

an outcomes perspective? According to Leithwood et al. (2006) success of reform efforts is often assessed through outcome measures. Senge (2006) referred to this as a fixation on isolated events. According to Senge (2006), this fixation on outcome measures can distract districts and schools from seeing longer-term patterns that likely impact reform. Could it be that teachers did not understand reform at a sufficient enough depth, to be able to identify all of the necessary components as articulated by Leithwood et al. (2006) and Coburn (2003)? Sarason (2000) stated, those belonging to particular groups "perceive in terms of parts and not a complicated system: *their* parts, *their* tasks, *their* problems, *their* power or lack of it" (p. 24). He went on to state "each group knows that there is a 'system' but each sees it from a particular perspective which, by its narrowness, precludes understanding of any other perspective" (p. 25). District-wide reform is complex. Teachers may not have the necessary background knowledge about the interrelated nature of the system to be able to articulate many of these elements. Alsbury (2008) stated "findings indicate that Crockett teachers were either not aware of or were not confirming a collaborative establishment, understanding, or support of a district mission driving a reform effort" (p. 187).

In addition to addressing disconnects between different groups in the system, Alsbury (2008) also reported on some disconnects within the system itself. Interview data indicated a lack of collaborative planning between the two groups. There was also a lack of reform elements within other systematic components such as: teacher evaluation documents, observation protocols, school budgets, permanent or yearly staff development programs, and hiring policies. Alsbury (2008) reported schools had no process for evaluating the reform efforts within each classroom. This may have indicated that while

the district supported reform efforts, there was no pressure on teachers to implement the curriculum as designed. In other words, there was no way to monitor the depth of SWH practices or to ensure that learning led to meaningful changes in teaching practice.

Additionally, teachers reported that they viewed this reform as a central office reform and that the curriculum director was the main point of contact for reform issues. This may have indicated a lack of shift in ownership between district reformers and teachers. According to Coburn (2003), a shift in ownership is essential. Reform must take root in the school buildings, not in the district office. According to Alsbury (2008), many of Coburn's principles of sustainability appear to be missing from this system. Although teachers mentioned a shift in some pedagogical practices, it appears that this shift is limited to some of Crockett's teachers. It also appears that depth of reform efforts may be variable.

A monitoring tool, based on the theory of organizational learning as articulated by Leithwood et al. (2006) and on Coburn's Sustainability Theory (2003) was used to evaluate the reform effort in Crockett School District. The monitoring tool served as a strong theoretical framework outlining the components necessary for successful change and sustainability. In this case, the monitoring tool was used as a summative assessment of reform efforts and aided in the identification of the presence or absence of elements necessary for successful implementation and long-term sustainability.

The Organizational Assessment Survey. The second empirical research study by Alsbury is closely connected to the previous one. In this study, Alsbury (2012) used the Organizational Assessment Survey to assess reform efforts. According to Alsbury (2012), research from the Crockett School District study validated the use of the Organizational

Assessment Survey (OAS) as an effective instrument for assessing potential sustainability of organizational reform. In addition, the study showcases the need to "increase organizational capacity to implement and sustain innovation" (p. 4-5). Finally, the findings from this study confirm the need for organizational systems, which will support other reform efforts. According to Alsbury (2012), "successful reform initiatives require school leaders to anticipate and accommodate for a shift in culture, the introduction of new paradigms, and the natural push-back that will likely occur when new initiatives are introduced" (p. 14). He stated that organizations must address sustainability at the outset of the reform. The Organizational Assessment Survey can be used as a monitoring tool to aid in this purpose.

According to Alsbury (2012), the Crockett study showcased some missing elements. Specifically, the study highlighted the need for a "collaborative, cross-district leadership team to be trained in the sustainability variables discovered in the pilot study" (p. 5). This team would be responsible to (a) manage the implementation of the OAS survey, (b) analyze and interpret relevant data, and (c) make recommendations for the elimination of potential organizational barriers at all levels (district office, building, and classroom). In this next study the collaborative, cross-district leadership team became known as the Innovation Leaders Academy (ILA).

Alsbury's study conducted from 2007-2011 measured how the organizational assessment tool, in combination with an Innovation Leaders Academy, might impact district reform and sustainability. Six rural school districts participated in the STEM pilot. In all cases the districts were in isolated areas, had high levels of poverty, and had high numbers of minority students. In addition, many students struggled academically. This

reform effort was funded by a grant from the National Science Foundation for a STEM

study. According to Alsbury (2012), the purpose for the reform was to:

> build a bridge from isolated middle schools in a rural Southeastern State to the
>
> high technology resources and professional development at research universities
>
> in the urban center of the state to effectively teach STEM disciplines to their
>
> students and instill in them an understanding of the potential of STEM careers. (p.
>
> 7)

The ILA team consisted of key stakeholders including the district superintendents,

assistant superintendents/central office directors, school principals, teacher leaders, and

logical support staff. In order for ILA teams to assess their organizations accurately,

teams needed to include members from the different groups involved in the innovation. In

addition, the team needed to include the members who make key policy decisions about

elements such as funding, hiring practices, changes to policy, observation and evaluation

of teaching practices, etc. This is important to successful and sustainable reform, because

these members are responsible for alignment of interrelated elements across the system.

The ILA's purpose was to identify and eliminate potential barriers within the

organization and to develop and support organizational characteristics, which would

promote implementation of reform efforts and lead to sustainability. First, the team would

work together to describe issues in need of remediation. Next, they would use the

Organizational Assessment Survey to measure the variables that might either support the

reform effort or present barriers. They would develop an Innovation Program Support

Plan, which would guide reform implementation and would be structured so as to prevent

possible barriers. Last, they would evaluate reform efforts and revise the plan as necessary.

Researchers worked with ILA team members to prepare them for this work. They provided leadership training in six areas (capacity building, collaborative decision making, change processes, distributed leadership, adaptive leadership, and sustainability). Researchers also observed ILA team processes and offered coaching. They facilitated the data collection process on several levels (contextual data, organizational data, baseline data and annual data). Finally, they provided coaching to the ILA team and support as the team made recommendations on the changes needed for sustainability of the reform (Alsbury, 2012).

In this study, Alsbury (2012) worked with five school districts. All of the districts had similar characteristics in terms of gender percentage, ethnicity, and tenure. Of the five districts, four of them served as treatment groups and one served as the control group. All five districts received the same STEM materials and trainings. The main difference between the control group and the treatment groups was that the treatment groups had ILA teams and the control group did not. As a result, researchers could study the effect of ILA teams on organizational processes and sustainability of reform.

The Organizational Assessment Survey was given to all ILA team members (which included: the superintendent, assistant superintendent/curriculum director, middle school principals, and teacher leaders), all middle school assistant principals, all teachers involved in the delivery of the new STEM initiative, and all relevant staff (such as technology support staff). The survey was divided into two component parts. The first part covered questions about general organizational components and was given in the

Spring of 2011. This served as baseline data and gave researchers information about participant perceptions prior to the ILA's work and the new STEM implementation. The second part covered questions about specific program effects and was given in the Fall of 2011. In addition to studying perceptions about reform efforts and organizational structures, researchers could also study the differences in perception between control group responses and treatment group responses to look specifically for differences due to the presence of, or lack of, an ILA team.

Alsbury (2012) reported a drop in survey return rates from Spring 2011 to Fall 2011 and stated that this may be due to a high level of turnover (for both administrative staff and teachers) in some of the districts. According to Alsbury (2012), "this turnover does not challenge the ILA process" and "in fact the process is designed to be a continuous learning system and therefore tailor-made for high levels of constant change that can occur in school districts" (p. 20). Because the surveys were independent from each other, the drop in return rate was not an issue. Alsbury (2012) was able to use the data, as long as he had enough responses to satisfy statistical validity. This was the case for all but two districts. By the time researchers were ready to study control group and treatment group responses, they were left with three groups (one control group and two treatment groups).

Alsbury (2012) addressed the validity of the survey instrument and gives several examples to show the survey instrument has been adjusted to improve validity. First, the survey instrument has been used on multiple occasions. Alsbury (2012) reported the survey had been "administered at numerous sites both in the United States and Canada since 2001" (p. 14). Just like the Crockett School District study, the questions were based

on Coburn's (2003) principles of sustainability and Leithwood et al.'s (2006) critical

systems, processes, and conditions. Again, this provided a valid, research-based

framework for organization of responses and increased the level of construct validity.

Second, Alsbury (2012) stated the survey questions were based on the ELCC leadership

standards, which were based on empirical research. Third, the questions had been

reviewed and revised by secondary school administrators and by 45 district teams from

six districts who had piloted the survey. This increased the level of content validity,

because revisions were made for clarity and to include important areas that had been left

out of the initial survey draft. Fourth, researchers solicited feedback from approximately

900 staff members from the pilot districts who participated in this survey. Again, the

questions were revised as necessary, thereby increasing the level of content validity. Last,

an ANOVA analysis was conducted to compare the means for the control group and the

participant groups. ANOVA analyses were done for each of the following categories:

innovation impact on the system, innovation impact on instruction, vision and planning,

effective leadership, accountability, use of data for continuous improvement, systems

thinking, and innovation and creativity. These results can be seen in the appendix and

confirm that the survey instrument has strong internal validity.

The Organizational Assessment Survey was used for two purposes. Researchers

used it to collect data. The ILA teams also used it to assess the characteristics of their

organizations. As stated above, ILA teams took the survey in the Spring of 2011. After

taking the survey, they worked together to look for strengths in the organizational

structure. They also looked for potential barriers to reform efforts. They used this

knowledge to create an Innovation Support Plan and worked to implement the plan, as

part of the STEM reform. In addition to assessing the sustainability of reform efforts, they worked to identify the elements most likely to lead to lack of sustainability and made a plan for reform, based on these identified elements. A comparative study of the results from Spring 2011 to Fall 2011 provided valuable information about the impact of ILA teams and the potential for these teams to foster sustainable reform.

Baseline data (based on results from the survey given in Spring 2011) showed some differences between the perception of the control group and the perceptions of the treatment groups. According to Alsbury (2012), as indicated from initial Spring survey results, the control group was less satisfied than the treatment groups with the amount of resources provided by the district. However, they were more satisfied with many of the characteristics specific to their organization. They also believed that district reform efforts could positively impact their instruction. Specifically, they believed their district was effective in communicating new programs, in nurturing leadership, in promoting change, and in open dialogue. All in all, Spring survey results show that the control group was more positive about organizational features and effective district-level communication than the treatment groups. On the other hand, Fall survey results showed a shift in control group perception from positive to negative. These same survey results also show a shift in the perceptions of both treatment groups. Specifically, treatment groups reported more positively about program involvement than the control group. A higher percentage of members from the treatment groups also reported that they either supported or highly supported the reform, as compared to members in the control group.

Alsbury (2012) stated that lack of awareness and support for the STEM program may have led to multiple concerns about implementation. This is evidenced in the data

from the Fall 2011 survey. Ninety percent of the members from the control group
expressed concerns about uncertainty regarding the effects of STEM reform. This level of
concern is much higher than the level of concern in both treatment groups. In addition,
high levels of concern are expressed by members of the control group in other areas such
as: pedagogical issues, curricular content, teacher workload, working conditions, impact
on time management, program cohesiveness, and negative effects on student welfare.
Again, areas of concern are much higher for the control group then for the treatment
groups.

The Fall survey showed that a higher percentage of treatment group members felt
the reform could sustain, as compared to the control group. Survey results also confirmed
a higher percentage of buy in for treatment groups than for the control group.
Specifically, treatment groups agreed (74% and 71%) that the STEM program would
have a positive change on teaching. Only 56% of control group members agreed to this.
Treatment groups also agreed (79% and 73%) that the STEM program would positively
impact student learning, as compared to 57% in the control group. Fifty-two percent of
control group participants reported that there were too many new district initiatives,
compared to 39% and 36% in the treatment groups. In addition, members of the control
group reported (33%) that they agreed with the statement that the district would support
the reform efforts (as compared to 51% and 67% in the treatment groups). Finally, the
treatment groups reported agreement with statements about increased dialog and
communication. For example: 53% of the members of both treatment groups agreed with
the statement that the school promoted dialogue and collaboration, as compared to 35%
of control group members. About 55% of all treatment group members reported

agreement to a statement about opportunities for meaningful discussions, as compared to 35% of the members in the control group.

Alsbury (2012) also addressed areas for which there was no statistical difference. Specifically, there was no statistical difference between the control group and the treatment groups in terms of involvement with reform efforts. Twenty percent of control group members reported positively on some part of the decision making process, as compared to 27% and 26% in the treatment groups. All in all, Fall survey results showed that the control group felt more overwhelmed, less supported, experienced less dialog and communication, and had higher levels of concern than both treatment groups.

It appeared that the ILA teams served as a mechanism to provide support for district teams through meaningful dialog and collaboration. It also appeared that these teams might have been able to identify concerns prior to reform efforts and to remediate some of these concerns so as to reduce the level of concern in the treatment groups. These findings were even more significant when considering the responses of the control group prior to implementation of ILA teams. In the Spring, they felt as if they had higher levels of collaboration, even with lower levels of support from the district. Both treatment groups expressed concern with the levels of collaboration in the Spring survey. After the implementation of reform efforts and ILA teams, the perceptions of both groups (control and treatment) shifted. The control group became much more concerned about reform efforts and more concerned about the level of collaboration and level of knowledge relative to reform efforts. On the other hand, both treatment groups expressed less concern with district reform efforts and felt stronger about the levels of collaboration.

According to Alsbury (2012), researchers asked one open-ended question, in an attempt to collect data about the purpose for STEM reform. Alsbury (2012) included some of these responses for members of the control group and members of both treatment groups. Control group responses seemed to be negative in nature or indicated a lack of knowledge with regards to the STEM initiative. Responses from the treatment groups were related to the impact on learning as a result of the STEM project. Specifically, Alsbury (2012) stated that the ILA process put pressure on teams to engage in collaborative decision making and to use data to set strategic goals which, in turn, led to accurate evaluation of implementation efforts. He also reported that survey responses indicated the discovery of and the remediation for "faulty two-way communications" and the lack of or indication of "poor operation of feedback loops" (p. 30). Responses also showcased coherence of program and support of different facets within the organization (such as budget, personnel, and training). Many of these facets were also missing in the Crockett School District. In addition, responses indicated that the presence of ILA teams significantly changed the original ILA plans, which facilitated the process whereby necessary adjustments were made to the organization.

It appeared that the presence of the Innovation Leaders Academy had a positive impact on the reform movement for both treatment groups and that the lack of the ILA team may have been a detriment to the control group. It also appeared that the shifts necessary for sustainable reform may have taken place within the treatment groups. It is important to note that the data in this study is a comparison of means. No analysis was done on the significance of mean changes. As a result, although there appeared to be

differences between the means, there is no evidence to support the level of significance between these differences.

Conclusion. In both of Alsbury's studies (2008, 2012), the monitoring tool was used in a two-fold fashion: (a) to collect data about the organization, and (b) to assess characteristics and strategically plan for reform and sustainability. In both studies, the monitoring tool serves as a strong theoretical framework for reform. The monitoring tool also helped key members of the organization to identify barriers to reform and to work to prevent those barriers. Results from these studies indicated that a monitoring tool aids in evaluation and supervision of specific organizational characteristics. There is however, no evidence to support whether or not a monitoring tool aids in long-term sustainability. This is an area for future research.

Both of Alsbury's studies (2008, 2012) attempted to draw a direct connection to the theory of organizational learning. In both cases, Alsbury used a monitoring document to evaluate the elements of organizational learning. Evidence from Alsbury's (2012) study of STEM reform indicated that the monitoring document has high internal validity. In addition, this same study provided evidence to indicate the ways in which the document was adjusted to improve content validity.

In his study of a recent STEM reform (2012) he worked with districts that utilized this document to monitor the organizational learning of their own organizations. As part of this study, the ILA team identified barriers and plans for remediation of these barriers, before they become an issue for the organization. The addition of the ILA team appeared to be an effective way to involve key stakeholders in collaborative practices, which minimize barriers to reform. In Alsbury's (2008) study of Crockett School District, one

may conclude that the district will struggle with sustainable reform, due to a lack of focus on key district-wide organizational structures. For example, one of the missing elements from Crockett's reform efforts was a system of observation/evaluation, which is tied to reform implementation. Without this system, it will be difficult for the district to monitor a meaningful shift in teacher behavior or instructional practice. According to Leithwood et al. (2006), this is a key element to organizational learning. This is evidence that Crockett School District may have difficulty sustaining the reform over time.

When analyzing Alsbury's (2012) study on STEM reform, it was clear that he saw this gap in the research and attempted to remediate for it by adding the ILA team, as a means for assessing missing organizational elements and for making plans to remediate prior to reform. More research will be needed in order to see whether or not the addition of an ILA team leads to sustainability over time.

Coburn (2003) discussed the scale of reform and stated that the following four elements are necessary to adequately address scale: depth, sustainability, spread, and shift in ownership. Because Coburn's variables (shift, depth, and scale) are built directly into the monitoring tool used for both of Alsbury's (2008, 2012) studies, the connection to Coburn's (2003) theory is clear. Alsbury (2008) reported that very few administrators articulated the presence of Coburn's principles in the Crockett School District study. This was the case, even though a high percentage of administrators were able to articulate many of Leithwood et al.'s (2006) principles. This may be evidence that these elements are difficult to articulate, are assumed by administrators, or are unknown. Additional research may be necessary to address the possible gap between administrator understanding of the principles of organizational learning as opposed to Coburn's

principles of scale. Perhaps there is a connection between principal standards and evaluation practices and the presence of, or lack of presence, in relation to the elements in these two theories.

In the study of organizational learning (OL) in an urban childcare center, researchers attempted to assess the OL that occurred as a result of a yearlong intervention meant to improve relationships and culture within the center (Austin & Harkins, 2008). Researchers used multiple tools to measure organizational learning. Specifically, they used a Learning Organization Assessment to measure OL, but reported that this tool was of high readability and was intended to measure organizational learning in business settings. It is unclear what variables were being measured with the Learning Organization Assessment and whether organizational learning occurred as a result of this intervention. A monitoring tool, which is based on theory and empirical research, might have aided in assessment of organizational learning in the childcare center study.

The synthesis of research by Leithwood et al. (1998) provided valuable information about variables associated with organizational learning. The studies were grounded in theory and the variables were identified based on empirical research. This synthesis provided a valid and reliable framework with which to study organizational learning in schools. Leithwood et al. (2006) have created their own set of surveys, based on this research that can be used to evaluate organizational learning in schools and school districts. These surveys are readily available and can be found in the text: *Making Schools Smarter: Leading with Evidence* by Leithwood et al. (2006). A total of 20 surveys are available for use. Administrators can give all 20 surveys or they can select specific surveys that would best measure targeted aspects of organizational learning. This

research study was intended to measure organizational learning as it relates to all of the

relevant variables. To ask teachers to complete all 20 of the surveys created by

Leithwood et al. (2006) for this study would likely lead to a drop in response rates and

may not provide a complete picture of organizational learning for this particular reform.

Choosing to use the studies by Leithwood et al. (2006) was not a viable option for this

research study.

Based on the research presented in this literature review, it was hypothesized that

a monitoring system might serve as a useful tool for evaluating and supervising

strategically identified organizational characteristics. A monitoring system that is

grounded in theory and research serves as a means for assessing essential elements to

successful reform implementation and sustainability. The connection to theory is clear in

both studies done by Alsbury (2008, 2012). Teachers in the Crockett School District

struggled to sustain reform, due to key disconnects within the organization and the

system. Results showed a lack of collaborative planning, a lack of knowledge with

regards to SWH practices, and a lack of key components such as evaluation documents,

observation protocols, school budgets, staff development programs, and hiring policies

(Alsbury, 2008). Evidence also pointed to a lack in shift of ownership from district

reformers to teachers. Alsbury's (2012) study of STEM reform indicated that the use of a

monitoring tool, along with a team of key stakeholders, appears to be an effective way to

promote spread of the reform. Ultimately, Alsbury's (2008, 2012) research pointed to the

complexities involved in systematic and sustainable reform. There are many elements at

play. Without a monitoring system to identify these elements, a district may have a

difficult time working to prevent barriers associated with each element.

The application of these findings to the field of education may be a necessary next step in ensuring that the time and resources invested in reform efforts is beneficial to the organization. Alsbury's (2012) monitoring tool, which he called the Organizational Assessment Survey, might serve as a promising tool for district monitoring and strategic planning. This tool can be used to measure the variables related to organizational learning, as well as the variables related to potential sustainability. It can also be administered in about 25 minutes, which is more manageable for those participating in the study. For this study, Alsbury's Organizational Assessment Survey was used to investigate current conditions of reform implementation for a mid-sized school district's mathematics reform. The researcher employed a statistical analysis to investigate the potential relationship between key reform elements and amount of reform implementation experience. This relationship was investigated for two groups of teachers (those with four or more years of implementation experience and those with three years of implementation experience or less). Strengths to current reform implementation were identified, as were barriers to future sustainability.

Chapter Three

Research Methods

This study was intended to contribute to the knowledge base on reform

implementation and sustainability. The Organizational Assessment Survey, constructed

by Alsbury (2012) to include essential elements for successful reform and sustainability,

was employed. This survey was grounded in Organizational Learning Theory as

articulated by Leithwood et al. (2006) and Sustainability Theory as articulated by Coburn

(2003). This study focused on the association between two variables (Field, 2013; Fink,

2013; Gall, Gall, & Borg, 2003). The first variable was amount of implementation

experience with a medium-sized school district's large-scale mathematics reform and the

second variable was level of agreement relative to reform elements on the Organizational

Assessment Survey. Strengths to reform implementation were identified based on teacher

responses associated with a positive level of agreement (agree and/or strongly agree). The

same survey tool was used to study the association between amount of teacher experience

with this program and potential barriers to future implementation and long-term

sustainability. Barriers were identified based on items with which teachers reported

negatively (for example, disagree or strongly disagree). Potential barriers were also

identified based on items with which teachers reported a perception that was either

neutral or unknown. This was determined based on the question asked and whether or not

a neutral/unknown response was associated with lack of knowledge about a particular

reform element.

In addition to studying system-wide strengths and barriers, the researcher used a

correlational design to determine whether a statistically significant association exists

relative to specific reform elements, between teachers with four or more years of implementation experience with the district's reform and those with three years of implementation experience or less. Study results provided additional insight into the research relative to teacher experience and reform implementation and sustainability.

Chapter Three details the methods, procedures, and components of statistical analysis that were utilized for this study. The research design is outlined in the first section and includes a description of the setting where the study was conducted. Participating schools and the method with which teachers were identified for selection is identified and variables are named. The second section of the chapter focuses on design of the survey instrument, data collection procedures, and methods of data analysis.

Hypotheses of the Study

The following research questions were used to guide the construction of this study.

Question 1: What are the frequencies of responses as they relate to level of agreement, disagreement, or unknown for each item relative to effective reform implementation and potential sustainability as measured by the Organizational Assessment Survey?

Question 2: Does a statistically significant difference exist for specific items relative to level of agreement, disagreement, or unknown for elements on the Organizational Assessment Survey between teachers who have differing levels of experience implementing the district's large-scale mathematics reform?

Hypothesis (Null) 1. There will be no statistically significant association between level of agreement, disagreement, and/or unknown for specific items on the

Organizational Assessment Survey and teachers with differing levels of implementation

experience specific to the district's large-scale mathematics reform.

Hypothesis (Alternative) 2. There is a statistically significant association

between level of agreement, disagreement, and/or unknown for specific items on the

Organizational Assessment Survey and teachers with differing levels of implementation

experience specific to the district's large-scale mathematics reform.

Research Design

A correlational research design was employed to investigate the association

between number of years of experience with reform implementation and level of

agreement relative to key elements aligned with implementation and sustainability. The

Organizational Assessment Survey, designed by Alsbury (2012), was the study tool. Use

of a survey enabled the study of the perceptions of a large number of teachers in the

district's primary schools. The survey was cross-sectional, with data being collected at

one point in time (Creswell, 2014; Fink, 2013). The researcher used a dual approach to

survey collection in order to reach as many teachers as possible. On a larger scale, the

survey was administered electronically. This enabled teachers to complete the survey on

their own time. Because the district is relatively small and school buildings are in close

proximity to each other, a group administration approach to data collection was also

utilized. Visits were made to each primary school on a designated date and at a

designated time. Teachers had the opportunity to learn more about the purpose for the

study and about the process for survey completion and collection. Teachers then

completed the survey electronically at their own convenience.

There were several potential benefits to the group administration approach. First, this approach was used so that the researcher could make direct contact with a large number of teachers from each building. Second, the researcher could explain the purpose for the research and answer questions about electronic survey collection methods. The hope was that this would help to increase the overall response rate (Fink, 2013). Third, teachers could be directly encouraged to complete the survey, helping to prevent issues with sampling error (Salant & Dillman, 1994).

In addition to these strengths, the group administration approach had some weaknesses. Because planned meetings were outside of the teachers' contracted day, there was no guarantee that teachers would attend. The times and dates selected may or may not have been convenient for teachers or they may not have been interested in giving up their time to attend a meeting and/or complete a survey. In the case of this particular study, it is likely that the group administration approach had minimal positive effects on the participation rate. In total, a small number of teachers attended group administration meetings including: six teachers from School A, two teachers from School B, five teachers from School C, and six teachers from School D. For buildings with five or six teachers present, teachers were representative of the different grade levels within the buildings. It is possible that these teachers shared the information learned at the group administration meetings and/or that they encouraged colleagues to complete the survey. That being said, because of the small numbers of teachers present at these meetings, it was essential that the researcher not rely completely on the group administration approach.

In addition to the group administration approach, the researcher used an electronic survey collection method. The survey was administered electronically through SurveyMonkey. A list of all K-4 math teachers was entered into the SurveyMonkey system by the researcher, along with the email addresses for each of these teachers. SurveyMonkey was set up to send an initial invitation to all teachers directly after the group administration meeting. Once invited, teachers could complete the survey at any time within the survey window. SurveyMonkey was set up so that teacher responses were completely anonymous. Additionally, SurveyMonkey was set up to send weekly reminders throughout the survey period.

According to Fink (2013), "larger samples tend to reduce sampling errors" (p. 88). Because differences between two groups were being analyzed, it was essential that sample sizes were large enough for each group. To better ensure a large enough sample, (a) the researcher began this process with an accurate list of teachers for each group (those with four or more years of implementation experience and those with three years of implementation experience or less), (b) the researcher checked to be sure that each teacher was entered into the SurveyMonkey system only once and that email addresses were entered accurately, and (c) the researcher tracked response rates regularly. SurveyMonkey was used to send regular reminders to those who had not yet completed the survey and to those who had partially completed the survey. This helped to ensure that survey response rates were relatively high (69%) and were representative of the population (Fink, 2013).

Setting

The School District.

District demographics. This study was conducted in a mid-sized school district in the Northwest. The community is home to approximately 31,500 residents. The district has four primary schools (grades pre-K through 4), two intermediate schools (grades 5-7), one junior high school (grades 8 and 9) and one high school (grades 10-12). The district serves just over 5,600 students and has seen a steady increase in diversity over the past couple of decades. In 1995, the district had an overall free and reduced lunch rate of 19.5%. The district's overall free and reduced lunch rate is now close to 37% (Office of Superintendent of Public Instruction [OSPI], 2016). The district is also seeing more diversity in terms of race/ethnicity and Transitional Bilingual students.

This study focused on the four primary schools and specifically on teachers teaching math to students in kindergarten through fourth grade. In the 2015-2016 school year, the four primary schools served approximately 1,922 students (Office of Superintendent of Public Instruction, 2016). Sixteen percent were Hispanic/Latino of any race (s), 0.25% were American Indian/Alaskan Native, 6.3% were Asian, 8.9% were Black/African American, 0.9% were Native Hawaiian/Other Pacific Islander, 49.6% were White, and 18.1% were of Two or More Races. Fifty-four percent of the district's primary students were male and 46% were female. Of the four primary schools, School A served 462 students and had a free and reduced rate of 41.4%. School B served 495 students and had a free and reduced rate of 38.9%. School C served 410 students and had a free and reduced rate of 34.7%, and School D served 507 students and had a free and reduced rate of 45.1%. All four primary schools were similar in the percentages of special

education students served, ranging from 13.3% to 15.9% and served similar percentages of Transitional Bilingual students, with percentages ranging from 6.3% to 8.4%.

The primary schools had 146 teachers, as reported by OSPI in May of 2016 (36 teachers in School A, 37 in School B, 33 in School C, and 40 in School D), averaging 16.2 years of teaching experience. Of those 146 teachers, 61.5% had master's degrees and 84 of them taught math. Because the study was on implementation of the district's mathematics reform, the focus was strictly on the district's primary math teachers. Of the district's current 84 math teachers, 63% of them have four or more years of experience implementing the district's math program and 37% have three years of implementation experience or less with the district's math program.

District mission. The mission for the district is articulated in the strategic plan and states that the district will work to ensure all students grow to be competent, contributing citizens. The plan articulated that students demonstrate individual character traits, emotional strength, and social skills necessary to succeed. It also stated that students grow to understand the importance of work and how performance, effort, and decisions directly impact future educational and career choices. The strategic plan included three academic standards/goals (as identified by the school board).

Standard One: Student achievement will exceed that of the state and the nation.

Standard Two: The district will make yearly progress toward eliminating the achievement gap.

Standard Three: Grade level cohorts will make continuous progress over time and when compared to their state peers.

District administrators report to the board every October on the district's progress specific to these goals. Although the district has strong athletic and music programs, the main focus is on academic progress. The district has had a reputation for academic excellence and high quality programs. Academic excellence is of high priority for many parents, teachers, and administrators.

Staff stability. From 2010 to present, the primary schools experienced high teacher and administrator turnover. In late 2013, the district hired new principals for Schools B and D. In late 2014, the district hired new principals for Schools A and C. In late 2016, the district hired a new assistant principal for School B. Administrator turnover has had an impact on the primary system.

The primary schools have also been subject to a large amount of teacher turnover. As of September 2016, the district has a total of 82 mathematics teachers teaching general education in the four primary buildings. The district also has two math specialists, serving students in grades 2-4. Of these 84 math teachers, 56 (63%) have four or more years of experience with the district's newly adopted math curriculum and 28 (37%) have three years of experience or less with the district's math reform. It is possible that the lack of teacher and administrator stability could be a potential barrier to district- and school-level reform efforts, because stability is likely related to the amount of experience a principal and/or teacher has relative to reform implementation. The relationship between reform implementation and teacher experience was a focus for this study.

The Mathematics Project. This study focused on the perceived presence or absence of specific elements necessary for successful implementation and sustainability

of the school district's mathematics reform. The district was awarded a Mathematics and

Science Partnership (MSP) grant, which was funded with Title II, Part B dollars. This

was one of two MSP grants to be awarded to the district from 2009-2015. The first grant

was awarded in July of 2009 for a three-year period and was titled: The Math Getting It

Project. The school district was the lead organization in charge of the grant and was

responsible for project management and administration, professional development design

and delivery, identification and recruitment of teachers for professional development,

identification of teacher leaders for Professional Learning Community work and in-house

professional development, the collection and analysis of MSP data, reporting of data for

Title II, Part B purposes, and technical assistance and support for teachers and

administrators involved in reform efforts (MSP Grant, 2012). Multiple partners were

involved in this first grant, including a local university, a county staff development

consortium, and two similar sized school districts in the state. These partners were

involved to varying degrees. As the lead organization, the school district had the largest

role in overseeing and delivering the reform. The focus for this study was on mathematics

reform as it relates to this particular district.

The district applied for the MSP grant in an attempt to address what co-directors

of the grant referred to as a "troubling problem in education" (MSP Grant, 2012).

According to one co-director (2010), "the math problem is common to most U.S. school

districts" (p. 58). She stated "students frequently do not 'get it' when they progress

beyond 4th grade into fraction concepts, and later when they reach pre-algebra and higher

mathematics courses" (MSP Grant, 2012, p. 4). Co-directors of the grant attributed the

math problem to the persistent absence of instructional strategies necessary to "embed

core mathematical structures in student thinking". They believed this problem often

presents itself when students begin learning fractions, but continues to be present

throughout the K-12 system. This co-director (2010) also spoke to the district's concerns

about mathematics achievement for low-income students. She reported that in 2008, only

23% of low-income 10th graders passed the state assessment. This was of particular

concern, due to No Child Left Behind mandates, which required that 100% of students

reach maximum proficiency on state assessments by 2014. According to this co-director

(2010), the district's Superintendent "challenged her administrative team to make

increasing math achievement for low-income students a top priority and approved the

redirection of significant district resources to the task" (p. 58-59).

According to district documents, The Math Getting it Project had one overarching

purpose: "To provide long-term professional development designed to improve student

outcomes in mathematics and reduce achievement gaps" (Math: Getting It Project, 2009a,

p. 3). This purpose was further defined through the presence of three goals:

Goal One: To increase mathematical content and pedagogical knowledge of

teachers and principals throughout the K-12 system

Goal Two: To implement instructional strategies designed to embed core

mathematical structures into student thinking

Goal Three: To improve mathematical achievement for students in grades K-12 at

participating schools

These goals were further defined by a set of objectives which included the increase of

content knowledge at each grade level; the identification and implementation of specific

instructional strategies; the increase in vertical alignment of mathematics standards and

mathematical structure throughout the K-12 system; an increased understanding about how students think about mathematics, particularly students from diverse economic, cultural, and experiential backgrounds; an increase in student engagement within mathematics lessons; an increase in the classroom teachers' ability to analyze student data and make data-driven decisions; an increase in teacher confidence relative to the teaching of mathematics content and pedagogy; and an increase in principals' knowledge relative to the use of evidence of math content and strategies during teacher observations. The ultimate goal was to increase mathematics achievement for students in the K-12 system and to close the achievement gap for underrepresented groups of students, through increased access to challenging mathematics instruction and evidence-based programs (Math: Getting It Project, 2009a).

Program goals were addressed in a multiple ways. First, these goals were addressed through the use of weeklong summer institutes, consortium courses, and in-time professional development. In all cases, professional development was planned and delivered by trained teacher leaders who had in-depth knowledge of particular mathematics strategies, state standards, and effective instructional practices (Holmstrom, 2010; Math: Getting It Project, 2009c). At the start of implementation, all teachers in the K-4 primary schools were trained on the mathematics reform program. This training took place in the summer and fall of 2009. At this time, the new mathematics program became the district's required primary math curriculum. Teachers began implementing the program directly after being trained and were provided with the necessary materials required for full implementation. In-time professional development was also provided throughout the school year and in subsequent years, since the program was first

implemented in 2009. Teachers who were new to the grade level or new to the district were automatically added to the in-time training list and received continuous professional development throughout the school year. Principals and teachers could also request in-time training when it was needed and the district would often respond by planning for and providing the in-time training as requested.

Second, program goals were addressed through the use of data-driven Professional Learning Communities (PLCs). Teacher leaders were selected to serve as PLC leaders. Each primary building had one PLC leader per grade level. PLC leaders received professional development specific to the required practices necessary for data-driven PLCs to function effectively (Math: Getting It Project, 2009c). Specifically, these leaders were trained twice per year for the full three years of The Math Getting it Project grant cycle. PLC leaders were required to facilitate PLC meetings and to report monthly on the PLC's work. There was a small amount of PLC leader turn over from year to year, however many of the leaders remained in the PLC leader position over the course of the initial three-year grant cycle. Reports were provided to each building principal and to the co-directors of the grant (a district administrator responsible for mathematics, data collection, and assessment and an instructional coordinator). Building- and district-level administrators used PLC reporting documents to assess the functioning of individual PLCs and to identify needs. Each building PLC met weekly to discuss reform implementation, specific to math strategies, curriculum materials, student assessment results, and next steps in instruction. PLC leaders also completed yearly PLC rubrics (Holmstrom, 2010). Teacher leaders used these rubrics to analyze the performance of

their PLC teams and to reflect on and plan for next steps to strengthen the functioning of the PLC.

Third, program goals were addressed through principal training and observation protocols (Math: Getting It Project, 2009c). Building administrators received training in the area of math observation. The goal was to increase administrator confidence relative to instructional strategies, the work of the PLC, and math pedagogical practices, so that administrators could be more equipped to give targeted feedback to teachers after math observations. Teachers were required to complete one math observation per school year. In addition, building and district administrators completed classroom walk-throughs to collect data for grant purposes (Holmstrom, 2010). The 2012 Math: Getting it Project Grant Report indicated that district and building administrators completed over 100 walk-throughs the first year and 48 walk-throughs in year two of the initial grant. They reported that the decrease in the number of walk-throughs was due to a capacity problem. Specifically, they reported feeling the need for more time and more personnel.

Fourth, program goals were addressed through the design of specific curricular materials, and through the creation of grade level curriculum maps and pacing guides. This was an essential component for a couple of reasons. First, the program was built specifically for the teachers in this school district, based on extensive research from several disciplines, including mathematics education, effective instructional research, neuroscience research on learning and memory, and research specific to learning disabilities (Math: Getting It Project, 2009b). This research was used in the creation of specific strategies, models, curricular materials, and lesson plans. Teacher leaders worked with district administrators to create these unique elements. According to The Math:

Getting it Project (2009b), "referential activities provide students with powerful math models for future learning" (p. 1). The philosophy went on to state that "once these models are deeply embedded as academic background knowledge in memory, students will use them successfully in all future mathematics classes, from pre-algebra to calculus and beyond". The goal was to give students models that they can leverage for future learning. The specificity of this curriculum reform was strategically aligned to the philosophy and project goals and objectives for the district.

The creation of district-wide curriculum maps and pacing guides was also a key element. Teacher leaders worked with district and building administrators on the creation of these yearly pacing guides and curriculum maps and continue to revise and update them each year and throughout the year as needed. This has happened since the program was implemented in 2009. Teacher leaders have been included in the creation of mathematics reform materials and in the writing of pacing guides and curriculum maps, because they have an in-depth understanding of how the program is implemented in the classroom.

The district received a second Math Science Partnership grant in September of 2012. Like the first grant, this grant was funded with Title II, Part B dollars and was awarded for a three-year period. The second grant was titled: Common Core Math Connections and was written for grades K-5. Like the first grant, this one was used to improve teacher content and pedagogical knowledge and to increase instructional effectiveness relative to the district's mathematics reform. This second grant differed from the first one in that it called out the need to increase teacher ability to question and analyze student thinking to better understand the mathematical learning of students and to

make formative decisions relative to next steps in instruction. This grant also called for more work to be done on the definition of leverageable content knowledge through carefully aligned concepts. According to the 2015 grant report, "far too often students find math to be an unrelated jumble of lessons, and teachers struggle to help learners grasp crucial connections linking key math concepts together" (Mathematics and Science Partnership Grant, 2015, p. 5). This grant focused specifically on the creation of mathematics lesson plans and materials, which were aligned with the Common Core State Standards. Many of the elements from the first grant were continued with this second round of MSP grant funds, including summer institutes, in-time math training, creation of math materials, collaboration between teacher leaders and building and district administrators, and collaborative work between grade level teams.

In total, the district received six-years of competitive grant funding from the Math Science Partnership. Grant funding ended in September of 2015. The district has dedicated a considerable amount of resources in addition to the Title II, Part B funds and has continued to allocate resources for the 2015-2016 and 2016-2017 school years. Additional funding had been allocated for the following: professional development for teachers specific to math intervention practices for students struggling with mathematics reform concepts, continuous in-time training for teachers new to the grade level or new to the district, the creation of Common Core aligned mathematics lessons and accompanying materials, principal observations aligned with program implementation, district administrator support for principals, etc.

Worth noting is the amount of teacher and administrator turnover as mentioned earlier in this chapter. One might argue that turnover has been substantial and is

associated with the amount of experience teachers and principals have relative to reform implementation. The amount of experience that teachers have could vary widely, depending on exposure to different reform elements such as the amount of professional development teachers have received, the amount and type of teacher leadership experiences offered to teachers with varying levels of experience, the level in shift of ownership, the depth of knowledge teachers possess, etc. The district has attempted to remediate for differences in experience by providing supports such as: additional materials, access to regular professional development, support from highly knowledgeable teacher leaders, etc. One may question whether these supports are effective in preventing potential barriers to reform efforts associated with differing levels of experience. The focus of this study was on the relationship between amount of experience and specific variables associated with reform implementation and sustainability.

Elements of implementation. The district has focused on several factors throughout the course of reform implementation including: week-long summer institutes, yearly "in time" training, professional development of teacher leaders for Professional Learning Communities focused on reform efforts, walk-throughs, principal training, principal observations and feedback, and design and implementation of common curriculum maps and materials. These elements have been implemented at differing levels throughout the course of the reform.

When the program was first implemented in 2009, all teachers were required to go through an extensive week-long mathematics institute. Principals worked with district office administrators to ensure 100% of teachers were trained. The district continued to

offer week-long summer institutes each year of reform implementation, but these summer institutes became optional after the first year of implementation. Although new teachers were strongly encouraged to attend, they were not required to attend week-long institutes.

At the start of implementation, principals in each school identified one teacher leader per grade level, who would be trained as a leader for the grade level's Professional Learning Community (PLC). These leaders received multiple trainings on the components required for grade level PLCs including facilitation of data-driven conversations, training on the elements of the math program, and PLC leader reporting requirements. PLC leaders also completed self-assessment surveys indicating the current level of PLC performance for their grade level Professional Learning Communities. These surveys served as evidence of current PLC experience and as a potential needs assessment by which decisions could be made for next steps. PLC leader trainings occurred twice per year for the first three years of reform implementation, but tapered off as reform implementation continued.

The district also provided yearly "in-time" trainings for teachers. These in-time trainings were optional for teachers who had already been trained and were required for all teachers new to the district or grade level. Yearly in-time trainings have continued throughout the course of reform implementation. New (or new to grade level) teachers continue to be trained by teacher leaders who have extensive knowledge of the mathematics program. In-time trainings occur monthly for each grade level and are based on the concepts determined most essential by the in- time trainer and those being trained.

During the first two years of reform implementation, the district completed walk-throughs to observe for elements of reform implementation. According to grant reporting

documents, district administrators completed over 100 walk-throughs the first year of implementation and 48 walk-throughs the second year of implementation (2012 Math Getting It Project Title II, Part B Grant Report). The district did not complete official walk-throughs after year two of implementation.

According to district documents, principals received training on the mathematics reform (Math: Getting It Project, 2009c). The goal for training was to increase administrator confidence about the instructional strategies used, the work of PLC teams, and math pedagogical practices, so that principals would be better prepared for observations and equipped to give targeted feedback to teachers. In addition, teachers were required to complete one math observation per year. Training of principals occurred during the first couple of years of reform, but has not continued throughout the course of reform implementation. Principals have continued to require mathematics observations and continue to observe for and evaluate the teaching of the mathematics program.

The design of common mathematics pacing guides, curriculum maps, assessments, and curricular materials has been a focus since the beginning of reform implementation. Teacher leaders worked with district administrators on the development of common curriculum maps and pacing guides. This work was done at the beginning of each school year and was reviewed and revised throughout the year as necessary. Teacher leaders have also worked with district administrators and district trainers to design common assessments and teachers are required to use them. Grade level PLCs worked with principals to study student performance on these assessments and to make team decisions about next steps in instruction. The district has also focused heavily on the design of common curricular materials throughout the course of reform implementation.

This was a focus as articulated in both the first grant (Math: Getting It Project) and in the second grant (Common Core Math Connections). A heavy focus on the creation and refinement of district curricular materials has been maintained throughout the course of reform implementation.

Because reform elements have shifted over time, experience with reform variables may be a key factor in this study. A teacher's level of experience with reform implementation may differ depending on the number of years involved with the reform. Identification of key reform variables may be connected to the amount of implementation experience. Implementation experience was defined according to the number of years a teacher has been exposed to the mathematics reform. Teachers within the two categories (those with four or more years of reform implementation experience and those with three years of implementation experience or less) likely differ in terms of exposure to teacher leadership, amount of training received, depth of knowledge relative to reform practices, etc. This was an area of focus.

Predictions

An understanding of the empirical research can be used when making predictions about how teachers might respond on the Organizational Assessment Survey, specific to potential strengths and barriers relative to the district's mathematics reform. According to Collinson et al. (2006), because systems are multilevel, they are dependent on the learning of individuals, groups, and the organization as a whole. Change within the system is constant. Processes must be put in place to store and retain the organizational learning that has taken place due to reform efforts. As new teachers enter the system, districts and schools must have processes in place to (a) ensure new learning for those

with less reform experience, (b) support teacher teams who have members with less implementation experience, and (c) sustain the learning for the system as a whole. In the case of this particular reform, supports and/or potential barriers might be associated with the presence of grade-level PLCs, quality and access to curricular materials, quality and frequency of professional development, leadership and accountability, presence or absence of feedback loops, the ability to think systemically, and articulation and understanding of the vision associated with reform.

As mentioned previously in this chapter, the creation of data-driven Professional Learning Communities (PLCs) was a program goal as articulated in the original grant. At that time, grade-level PLCs were created and PLC leaders received a substantial amount of leadership training. PLCs were required to focus on the RAMP math program. Specifically, PLCs focused on the strengthening of mathematical practices, the analysis of student-data relative to required assessments, pacing guides and curriculum maps, and other grant specific topics. A focus on PLCs remained throughout the life of the grant and continues. One might predict that these PLCs serve as a substantial support for teachers with three years of implementation experience or less. One might argue that teachers with more reform experience tend to have a deeper level of understanding relative to reform elements. Although this may not be true for all members of a PLC, the structure of the Professional Learning Community combined with dedicated time for PLCs to discuss reform elements might help to deepen understanding in teachers with three years of implementation experience or less. Regular participation in structured PLCs may aid in the learning of individuals and in the organization as a whole.

According to Leithwood et al. (1998), resources were frequently reported as being influential to organizational learning. This included access to professional development and curricular materials. Access to high-quality, job-embedded professional development (PD) has been a focus for the life of the grant, but there have been substantial shifts in PD delivery throughout the course of reform implementation. For example, when RAMP math was first implemented, professional development was required for all teachers. This was an essential first step in educating teachers about the math program. As the reform continued, professional development became optional for teachers with reform experience. Many teachers chose to take optional PD sessions, while others opted not to attend. It is likely this led to differences in the level of depth and ownership acquired by teachers across the district. On the other hand, all new teachers, or those new to a grade level, were required to participate in monthly "in-time" math trainings. These trainings were directly connected to the content with which teachers will be teaching in upcoming units. At minimum, those with less implementation experience have been through one year's worth of job embedded professional development. Ultimately, the content and structure of professional development was somewhat different depending on the amount of reform implementation experience one has had. Initial professional development (PD at the beginning of reform implementation) included training on all of the content in the program. Teachers were required to learn a lot of content in a very short time. Due to the structure of these trainings, it is unlikely that teachers learned all they needed to learn within the context of the PD session. On the other hand, teachers with less implementation experience are learning a little at a time. Trainers focused on depth of content over breadth. Because the structure and delivery of professional development has

varied over time, there may be differences in perception associated with professional development for teachers with more implementation experience and those with less experience.

According to Leithwood et al. (1998), access to curricular materials and resources is associated with organizational learning. The design of specific curricular materials was a focus for both Math and Science Partnership grants. Because materials for RAMP math were created specifically for this program and do not exist outside of the RAMP math program, this has been a substantial undertaking. When the reform first began, materials were provided to teachers in hardcopy format. All teachers received binders with lesson plans, math manipulatives, worksheets, etc. As the reform continued, materials were updated. Early on, many of the updates were made in hardcopy form. The second grant focused on the creation of an electronic system with which materials could be stored and accessed through a district-wide server. Now, as materials are updated, they are placed onto that server. Updates to materials are happening by district-level teacher teams regularly. Keeping up with these changes presents different challenges. Communication with teachers must be timely and clear. Teachers must feel comfortable with accessing materials electronically. The system of storage must be well defined and understood by those accessing materials. Because the electronic storage system is complex on multiple levels, one might predict that continued access to materials might be a system-wide barrier. Additionally, because new teachers are not given hard copies of curricular materials (worksheets and lesson plans), one might predict that this may be more of a barrier for those with less implementation experience than those with more implementation experience.

According to Leithwood et al. (1998), leadership and accountability are associated with organizational learning. One of the goals, as reported by those leading the initial grant work, was to build the capacity of building-level leadership and to put accountability structures in place for this particular reform effort. Principals were trained on the math content and on RAMP strategies. Additionally, accountability processes were put in place such as classroom walk-throughs, required observations, curriculum maps and pacing guides, and annual reports to building staff and to the school board. These processes aided in the deepening of understanding relative to reform elements and helped to hold teachers and principals accountable for reform implementation. All four of the principals involved in initial implementation have moved on to other positions. Additional principal training has taken place, but on a much smaller scale. As a result, the district's current principals differ slightly in their depth of knowledge about RAMP math practices and strategies. Based on this difference, one might predict that teachers perceive leadership to be a potential barrier to future sustainability. On the other hand, accountability measures are still in place. Teachers are required to implement the curriculum as designed and principals hold teachers accountable for doing so. Teacher leaders, serving as representatives for their PLC, check in with grade-level colleagues and building and district administrators about pacing and the teaching of specific content. Because teachers are required to implement the curriculum with fidelity and are held accountable for doing so, they may perceive innovation as a potential barrier to reform. One might predict that innovation will be identified as a system-wide barrier.

Alsbury (2012) spoke to the importance of feedback loops and two-way communication within the organization. As it relates to this particular reform, two-way

communication occurred in multiple ways. District administrators communicated with

building principals and with teacher leaders. Principals communicated with teachers.

Trainers communicated with new teachers or those new to the grade level. Teacher

leaders communicated with members of their Professional Learning Communities. One

might argue that the communication between those leading the reform is strongest with

teacher leaders who were directly involved in curricular changes, curriculum mapping,

training, and other reform elements. These teacher leaders were charged with

communicating with their colleagues. This approach has strengths and weaknesses. It

relied on teacher leaders and their individual communication skills, their perceptions, and

their willingness to communicate. Because the communication between the leadership

directly involved with continued reform efforts and teachers system-wide is somewhat

indirect, one might predict that there may be barriers related to two-way communication.

These barriers might exist system-wide or they might exist for those with less reform

implementation experience.

Based on empirical research, one might make predictions about organizational

learning and systems thinking. According to Sarason (1990), those involved in reform

tend to think about the reform based on the particular group with which they belong. As a

result, an individual's view of reform may be somewhat narrow. According to Senge

(2006), systems thinking is an essential component to organizational learning. This study

focused entirely on the perceptions of teachers. According to researchers, teachers may

be unaware of some of the system-wide reform elements (Sarason, 1990). Because this

study is focused on the perceptions of teachers, one might predict that there may be

system-wide disconnects related to systemic elements such as involvement of key

stakeholders, district-wide policy, involvement and influence of the school board, etc. One might also predict that this disconnect is more prevalent for teachers with less reform implementation experience than those with more implementation experience.

Finally, predictions might be made about the spread of reform, especially as it relates to articulation and understanding of the district's vision for the RAMP math program. According to Coburn (2003), spread is an essential element to sustainability. Spread is associated with more than the sharing of materials throughout the district. Spread must include the articulation of beliefs and principles. This includes the articulation of vision and values (Coburn, 2003). When the RAMP math program was first implemented all teachers were trained. Articulation of the mission/vision was part of the initial training. As reform implementation has continued over the years, the vision has remained strong, but has not been explicitly stated. Instead, it is somewhat assumed. One might predict that there may be differences in understanding relative to the vision for the RAMP math program between teachers with more implementation experience and those with less implementation experience.

Sampling Procedures

A single stage sampling procedure (Creswell, 2014) was employed in this study. The researcher secured the names and email addresses for all of the teachers currently implementing the district's mathematics reform. The goal was to survey as many respondents as possible. In the 2016-2017 school year, 84 teachers are teaching the mathematics reform (21 from School A; 20 from School B; 19 from School C; 22 from School D; and two mathematics intervention specialists teaching at either School A and C, or B and D). Survey response rates were monitored and regular reminders were sent to

increase the response rate and to better ensure that the sample was representative of the population.

Instrumentation

The Organizational Assessment Survey as designed by Alsbury (2012) was used in this study. According to Alsbury (2012), the Organizational Assessment Survey is an effective instrument for assessing reform implementation and potential sustainability of reform efforts. He stated that the survey "uniquely integrates proven organizational variables from pre-existing, validated assessment instruments that build upon the work of organizational, leadership, and reform theorists" (Alsbury, 2012, p. 13). The survey was based on Organizational Learning Theory by Leithwood et al. (2006) and Coburn's Theory of Sustainability (2003). According to Alsbury (2012), a significant number of survey questions were developed based on interview questions used and validated during Alsbury's study of Crockett School District from 2008. Questions were also developed based on the text by Leithwood et al. (2006) titled: *Making Schools Smarter: Leading with Evidence* (Alsbury, 2012).

Instrument validity. According to Alsbury (2012), "considerable attempts were made to ensure that the survey questions of the OAS are valid" (p. 14). The following procedures were used to ensure validity. First of all, the Organizational Assessment Survey was based on a model from Leithwood et al. (2006). Questions based on this model have been used and validated in numerous studies, which were conducted in both the United States and Canada since 2001. Questions based on Coburn's (2003) Theory of Sustainability were created and validated in Alsbury's (2008) study of Crocket School District.

Second, questions on the Organizational Assessment Survey were "derived from the ELCC leadership standards" (Alsbury, 2012, p. 15) and are validated based on multiple empirical sources. Alsbury (2012) stated that these standards serve as the content criteria for survey questions based on district vision and organizational leadership. Alignment to these theories and to the ELCC leadership standards helps to ensure construct validity (Fink, 2013).

Third, Alsbury (2012) worked to ensure content validity through the review of OAS survey questions. In one case, the survey was reviewed by 15 secondary school administrators who were enrolled in a doctoral program in Educational Administration at a State university. These administrators had an average of 14 years of experience and reviewed and revised OAS survey questions for content. In the second case, OAS survey questions were reviewed and revised by pilot participants in Alsbury's 2012 ILA study. According to Alsbury (2012), questions were revised by 45 district teams from six districts who participated in the ILA study and were asked to pilot and revise survey questions. Participants included superintendents, district and school level administrators and directors, and teachers. Alsbury (2012) stated that questions were revised for clarity and to include areas of interest that were not included in the original survey draft.

Fourth, Alsbury (2012) solicited feedback from approximately 900 faculty and staff from the ILA pilot districts. Specifically, feedback was solicited from participants who took the pilot survey. Again, OAS questions were revised for clarity, increasing the level of content validity and ensuring that questions were accurately representing the content being measured (Fink, 2013).

According to Alsbury (2012), an ANOVA analysis was conducted to compare the mean scores of those in the four treatment groups and the control group on the ILA Organizational Assessment Survey. Because the OAS is based on multiple components, Alsbury completed multiple ANOVA analyses in order to explore the multiple components of the monitoring tool. He looked specifically at the following categories: innovation impact on the system, innovation impact on instruction, vision and planning, effective leadership, accountability, use of data for continuous improvement, systems thinking, and innovation and creativity. Results from ANOVA analyses are reported in the appendix. According to Alsbury (2012), "an exploratory factor analysis with maximum likelihood extraction and varimax rotation indicates a strong internal validity to the survey instrument" (p. 16). Because this survey has been shown to have strong content and construct validity and strong internal validity, the intact Organizational Assessment Survey was used to study reform implementation and sustainability.

Variables

Two variables were the focus in this study. First, a set of ordinal variables was associated with the elements necessary for successful and sustainable reform as indicated by Likert-type items on the Organizational Assessment Survey. The second variable was associated with the number of years of mathematics reform implementation experience. It was categorical in nature and consisted of two groups. Group one contained teachers with three years of implementation experience or less. Group two contained teachers with four years of implementation experience or more.

More specifically, the researcher looked for the identification of perceived strengths. These strengths were identified based on the frequencies with which specific

items were reported positively by the two groups of teachers on the Organizational

Assessment Survey. The researcher also looked for potential barriers, which were

identified based on the frequencies with which specific items were reported negatively

and/or as an unknown. Descriptive statistics to show the frequencies for each item on the

OAS were reported. Finally, the researcher looked at whether or not a statistically

significant association exists for specific items identified positively, negatively, or as an

unknown on the Organizational Assessment Survey, between teachers who have differing

levels of experience implementing the district's large-scale mathematics reform.

Data Analysis

For this study, Kendall's tau-b was employed. This non-parametric test enables

the researcher to measure the degree of association between ranked variables (Field,

2013, Fink, 2013, Gall et al., 2003, Laerd Statistics, 2017). Kendall's tau-b should be

used when the researcher has a small data set and when there is a large number of tied

ranks (Field, 2013, Laerd Statistics, 2017). The Organizational Assessment Survey

measures responses based on Likert-type scales (Alsbury, 2012). Because the scales are

ordinal in nature and because the sample size is not particularly large, a non-parametric

test statistic was used. The Organizational Assessment Survey consisted of categories

which contain specific elements identified as necessary for successful and sustainable

reform. The researcher was interested in studying the individual Likert items within each

of these categories and looked specifically at the level of agreement, disagreement, or

unknown for each element. Items that were associated with high proportions of

agreement were determined to be system-wide strengths to district-wide reform and items

that were associated with higher proportions of disagreement were determined to be

potential barriers to continued reform and sustainability. The researcher also looked at

neutral responses and analyzed each question to determine whether a neutral response

might reflect reform strengths and/or reform barriers. Finally, the researcher used

Kendall's tau-b to study the relationship between the level of agreement on each item and

years of experience with reform implementation.

When reporting Kendall's tau-b, the correlation coefficient, the significance

value, and the confidence interval were reported (Field, 2013; Laerd Statistics, 2017).

Finally, descriptive statistics were reported, such as the total number of teachers who

took the survey, the number of teachers for each group, the number of teachers who

responded to each item, and the frequencies for Likert-type items within each category.

Chapter Four

Results

This study examined strengths and potential barriers to continued reform and future sustainability for a mid-sized school district's mathematics reform. Alsbury's (2012) Organizational Assessment Survey was used to identify strengths and barriers to current implementation and future sustainability. In addition, a correlational research design was used to investigate the relationship between number of years of reform experience and positive, negative, and/or unknown perception relative to specific elements necessary for successful and sustainable reform.

Two variables were used. The first variable was associated with number of years of implementation experience. This variable was categorical in nature and consisted of two groups of teachers. The first group contained teachers with 0-3 years of implementation experience. The second group contained teachers with four or more years of implementation experience. The groups were broken in this way in order to align with differences in reform implementation as determined by funding cycles for the math reform. Second, a string of ordinal variables was used and was associated with elements identified as necessary for successful implementation and long-term sustainability. This string of ordinal variables was aligned to items on Alsbury's (2012) Organizational Assessment Survey (OAS) and was based on Organizational Learning Theory as articulated by Leithwood et al. (2006) and Sustainability Theory as articulated by Coburn (2003).

This study was quantitative in nature. Data collection involved the administration of an intact survey designed and validated by Alsbury (2012). The survey was sent to 84

primary math teachers from four schools. This chapter outlines the strengths to current reform and potential barriers to future sustainability. Additionally, correlational data is analyzed to identify the elements/items where a statistically significant difference exists between teachers with differing levels of implementation experience. To begin the chapter, demographic data is reported and analyzed. Next, individual items from the OAS are analyzed in order to determine strengths relative to reform elements. Strengths are associated with high proportions of agreement on OAS survey questions. Each question is also analyzed in order to determine potential barriers to current implementation and future sustainability. Barriers are associated with higher proportions of disagreement. The researcher also studied question items with which a large proportion of neutral and/or unknown responses was given, to determine whether these might be associated with strengths or barriers. Data is reported for each item on the Organizational Assessment Survey, as are trends within larger reform categories. Next, correlational data is analyzed to identify statistically significant associations between teachers with differing levels of reform implementation experience and each item on the Organizational Assessment Survey. Finally, the results of the study are evaluated to address each research question and hypothesis statement.

Demographics

All of the district's 84 K-4 math teachers were invited to take the Organizational Assessment Survey. Of the 84 teachers invited, 57 teachers chose to take the survey (69% of the total population). Seventeen teachers were from School A (29%), 11 teachers were from School B (19%), 11 were from School C (19%), and 18 were from School D (31%). One might argue that Schools B and C were slightly underrepresented. Being that each

school has its own culture, this difference is worth keeping in mind. Of the total number

of teachers surveyed, 15.8% currently taught kindergarten, 19.3% taught first grade,

24.6% taught second grade, 15.8% taught third grade, 21.1% taught fourth grade, and

3.5% either did not identify the grade level taught or taught more than one of these grade

levels. Second and fourth grade teachers were slightly overrepresented when compared to

the total population. Approximately 23% of teachers surveyed had 0-5 years of teaching

experience, 47.4% had 6-20 years of teaching experience, and 28% had 20 years of

teaching experience or more. Less than 2% of respondents did not answer this question.

The vast majority of teachers surveyed were female (at least 86%). This is in line with the

total population of math teachers in the district. Finally, 36.8% (21 teachers) reported that

they had 0-3 years of implementation experience with the RAMP math program.

Approximately 63% (36 teachers) reported that they had four or more years of

implementation experience with the RAMP math program. Teachers with less

implementation experience who completed the survey were slightly overrepresented as

compared to the total population, but underrepresented as compared to the number of

teachers who completed the survey. Teachers with more implementation experience were

slightly underrepresented, when compared to the total population. The higher proportion

of teachers with four or more years of implementation experience in the sample

population is something with which to keep in mind.

Descriptive Data

   Organizational health. The first category on the Organizational Assessment

Survey was associated with the overall health of the organization and contained elements

based on level of satisfaction for the district's mathematics reform, perceived impact of

the reform, and level of satisfaction with specific elements of the district and/or school.

Table 1 shows OAS questions related to the general perceptions of K-4 math teachers

regarding the district's organizational health.

Table 1

Organizational Assessment Survey responses conveying the perceptions of teachers

regarding Organizational Health

Survey Question	% Positive	% Neutral	% Negative	General Strength	Potential Barrier
#8. Overall, how supportive are the school staff and faculty of the RAMP Math Program?	82.1	12.5	5.4	X	
#9. Overall, how supportive are the district staff and faculty of the RAMP Math Program?	83.6	10.9	5.5	X	
#10a. Note below what type of change the RAMP math program has or will likely have on you.	67.9	17.5	14.3		X
#10b. Note below what type of change the RAMP math program has or will likely have on your teaching.	76.8	14.3	8.9	X	
#10c. Note below what type of change the RAMP math program has or will likely have your students' learning.	82.1	8.9	8.9	X	

Survey Question	Satisfied	Somewhat Satisfied	Dissatisfied	General Strength	Potential Barrier
#11a. Describe your general level of satisfaction with your administration.	64.9	21.1	14.1		X
#11b. Describe your general level of satisfaction with your district.	75.4	17.6	7.1	X	
#11c. Describe your general level of satisfaction with your school.	80.4	10.7	8.9	X	
#11d. Describe your general level of satisfaction with your current grade/subject assignment.	87.7	7.0	5.4	X	
#11e. Describe your general level of satisfaction with your resources provided.	40.4	21.1	38.6		X
#11f. Describe your general level of satisfaction with your support from parents.	54.5	37.4	9.1		X

The table indicates that there are both strengths relative to organizational health and potential barriers. Strengths are associated with proportions of positive responses over 70%. Generally speaking, teachers perceived school and district staff to be positive about the RAMP math program (82.1% and 83.6% respectively). A high proportion of teachers reported that they believe the RAMP math program has resulted in positive change to their teaching (76.8%) and to their students' learning (82.1%). A high proportion of teachers also reported positively about their general satisfaction with the district (75.4%), their school (80.4%), and their current grade or subject assignment (87.7%).

Table 1 shows elements that could be associated with moderate levels of satisfaction. For example, 67.9% of teachers reported that the program has changed them

as individuals in a positive way. This is a relatively high percentage. However, 14.3%

reported that the program has changed them in a negative way and 17.9% reported that

the program has not changed them significantly. While a high proportion of teachers

perceive this reform to have a positive impact on their teaching and on student learning,

30% of teachers may not perceive this reform to be meaningful to them as individuals.

This could indicate a potential barrier to future sustainability.

In similar fashion, 64.9% of teachers reported that they were satisfied with their

administration. Again, this percentage is relatively high, however 35.2% reported that

they were either somewhat satisfied or dissatisfied on some level with their

administration. Because the researcher did not study differences within specific buildings,

one cannot ascertain whether these differences are site specific. That being said, the

lower percentage of satisfaction with administration could indicate a potential barrier to

future sustainability. A third area of moderate satisfaction is associated with the level of

support from parents. What stands out for this particular element is the proportion of

teachers reporting that they are somewhat satisfied with this support (37.4%). When

combined with the satisfied and highly satisfied categories, the total level of satisfaction

is high (91.9%). This could be perceived as a strength. However, a high percentage of

teachers reporting that they are somewhat satisfied with support from parents might

indicate that they need additional help in order to better involve parents with this

particular reform.

The general level of satisfaction with the resources provided for this reform is a

barrier to future sustainability. Approximately 38% of teachers reported some level of

dissatisfaction with the resources provided. An additional 21.1% of teachers reported that

they were only somewhat satisfied with these resources. Learning more from teachers about why they are dissatisfied or somewhat satisfied is an essential next step in reform implementation.

Decision making. The second category on the Organizational Assessment Survey is related to decision making and included items centered on development and clarity of vision, influence of reform goals on instruction, involvement of stakeholders, and effectiveness of communication to stakeholders. Table 2 shows Organizational Assessment Survey items related to decision making.

Table 2

Organizational Assessment Survey responses conveying the perceptions of teachers regarding Decision Making

Survey Question	% Positive	% Neutral, Somewhat, Unknown	% Negative	General Strength	Potential Barrier
#12. Does your district develop a vision for what success with RAMP math looks like?	62.5	32.1 Unknown	5.4		X
#13. How clear is your district vision of RAMP math to you?	31.6	61.4 Somewhat	10.5		X
#14. How much influence do you believe the district goals for RAMP math have on your instruction?	89.5 Strong, Moderate	NA	10.6 Slight, None	X	
#16. Are most stakeholders represented proportionally on decision-making teams?	28.1	43.9 Unknown	28.1		X
#17. Rate the effectiveness of your district in communicating goals and plans for the future with stakeholders.	33.3	50.9 Somewhat Effective	15.8		X
#18. How well do most stakeholders support the decision-making process?	47.4	45.6 Neutral	7.1		X

Based on teacher perception as reported in the survey, the majority of the elements in the decision-making category might be seen as potential barriers. Although the proportions of negative responses for each element are not particularly high, the concern rests with the number neutral or unknown responses. For example, one-third of respondents reported that they were uncertain about whether the district develops a vision for what RAMP math entails. Approximately 61% reported that the vision was either only somewhat clear or that it was somewhat unclear. Additionally, a moderate proportion of respondents (43.9%) reported that they did not know whether stakeholders were represented proportionally on decision-making teams.

When asked to rate the effectiveness of the district in communicating goals and a plan for the future with stakeholders, only 33.3% reported that the district was either effective or highly effective. Conversely, 66.7% of teachers reported that the district was only somewhat effective or not effective in communicating goals and a plan for the future. This is a potential barrier.

A third barrier in the decision-making category is associated with the level of stakeholder support for this reform. Although negative responses were low (7.1% reporting either highly non-supportive or not supportive), the proportion of teachers reporting a neutral response is equivalent to almost half of respondents (45.6%). As it relates to this particular element, only 47.4% of respondents reported positively that most stakeholders support the decision making process. Even though the decision-making category appears to be an overall barrier, a high proportion of teachers (89.5%) reported that the district's goals for RAMP math have a moderate to high influence on their

instruction. This is a strength and could be related to the fact that the program is required in all K-4 classrooms.

Table 3 provides more information about perceived level of influence had in the decision- making process. Specifically, this table shows that a high proportion of respondents believe principals and the superintendent have either measurable or major influence (66.6% and 66.7% respectively). Whether this is a barrier, is unclear. As is the case with Table 2, the number of unknown responses is somewhat high for specific stakeholders. For example, a higher proportion of respondents reported that they were unsure about the influence had by those in systems-level positions such as the principal (19.3% unknown), superintendent (24.6% unknown), and school board (24.6% unknown). The uncertainty in the elements addressed above could point to a system-wide disconnect. This disconnect might be a potential barrier.

A final barrier within the decision-making category is associated with perceived level of influence relative to this particular reform. Approximately 61% of teachers reported that they believe they have either slight influence or no influence when it comes to decision making for the RAMP math program. Additionally, 50% of teachers reported that their peers have either slight influence or no influence relative to this reform. A high proportion of teachers (69.6%) also reported that they perceive students to have only slight or no influence on this particular reform. The perceived lack of influence could be a barrier to future sustainability.

Table 3

Organizational Assessment Survey responses conveying the perceptions of teachers

regarding the Level of Influence in Decision Making

Survey Question	No/Slight Influence	Unknown	Measurable/ Major Influence
#15a. Indicate who is involved in decision making in your district and the level of influence they are given.- You	60.7	7.1	32.2
#15b. Indicate who is involved in decision making in your district and the level of influence they are given.- Other Teachers	50.0	3.6	46.5
#15c. Indicate who is involved in decision making in your district and the level of influence they are given.- Students	69.6	8.9	21.5
#15d. Indicate who is involved in decision making in your district and the level of influence they are given.- Principals	14.0	19.3	66.6
#15e. Indicate who is involved in decision making in your district and the level of influence they are given.-Superintendent	8.8	24.6	66.7
#15f. Indicate who is involved in decision making in your district and the level of influence they are given.- School Board Members	17.5	36.8	45.7
#15g. Indicate who is involved in decision making in your district and the level of influence they are given.- Parents and Community Members	49.1	24.6	26.4

Staff development. The third category on the Organizational Assessment Survey

is associated with staff development and included items concerning staff development in

general and staff development specific to the RAMP math program. Table 4 shows

teacher perception as it relates to these questions.

Table 4

Organizational Assessment Survey responses conveying the perceptions of teachers

regarding Staff Development

Survey Question	% Positive	% Somewhat	% Negative	General Strength	Potential Barrier
#19. In general, how effective is the staff development program in your district?	50.9	47.4	1.8		X
#20. How effective is staff development in directly supporting the RAMP math program?	38.6	52.6	8.8		X

As it relates to staff development in the district, the great majority of teachers (98.2%) reported that staff development was effective on some level. The level of agreement differed, however. Of the 98.2%, 50% reported that the staff development was either effective or highly effective. Approximately 47% reported that the staff development was only somewhat effective. A similar pattern was observed concerning staff development directly related to the RAMP math program. Again, a high percentage of teachers reported some level of satisfaction (91.2%), but the level of satisfaction differed in similar fashion. Approximately 39% of teachers reported that they were satisfied or highly satisfied with the staff development provided specifically for the RAMP math program, while 52.6% reported that they were only somewhat satisfied with the staff development provided for RAMP. Also worth noting, a slightly larger proportion of teachers reported being unsatisfied with the staff development provided for RAMP math (8.8%) as compared to the staff development provided in general (1.8%). It appeared that some teachers perceived the staff development to be sufficient and others feel it is not quite so. Based on these responses, the researcher could not make

conclusions as to why many feel the staff development to be only somewhat effective. It could be that teachers want more content or that they want content presented in a different way. This might also reflect a difference in perception between those who choose to attend staff development sessions and those who do not. Because a moderate proportion of teachers find staff development to be only somewhat effective, this is a potential barrier.

Innovation and change. The fourth category on the Organizational Assessment Survey is centered on innovation and change. This category contains items relative to the amount of innovation and change in the district, perceived level of support for the RAMP math reform, and teacher perception based on how often meaningful changes are made to the program based on assessment of strengths and weaknesses.

According to Leithwood et al. (2006), the implementation of too many reforms can lead to confusion within the organization. This might also lead to fatigue and frustration amongst teachers. One might predict that the perception of too much reform might be a potential barrier. When asked about the number of innovative reforms introduced, 57.9% of teachers reported that about the right number of innovative programs have been introduced in the district. This was somewhat surprising, when considering that teachers have been implementing RAMP math, new English Language Arts curriculums, the Common Core State Standards, the Smarter Balanced Assessment, and a relatively new teacher/principal evaluation system. That being said, 24.6% of teachers reported that they felt too many innovative reforms have been introduced. It is also interesting to note that 17.5% of teachers reported the perception that too few innovative programs have been introduced. Based on the spread of responses for this

item, one might question whether teachers understood the meaning of the word

"innovative" within the context of this study. Whether or not this particular element is a

strength or a barrier to this reform is unclear.

Table 5 contains additional information relative to innovation and change.

Table 5

Organizational Assessment Survey responses conveying the perceptions of teachers

regarding Innovation and Change

Survey Question	% Positive	% Neutral/ Sometimes	% Negative	General Strength	Potential Barrier
#22. In general, how receptive/supportive are the faculty to innovations or new programs?	59.6	31.6 Neutral	8.8		X
#23. How often do staff assess strengths and weaknesses of the RAMP math program that lead to necessary changes?	19.3 Usually	45.6 Sometimes	35.1 Rarely, Never		X

When asked whether faculty are supportive of innovations or new programs, 59.6% of

teachers reported they believed faculty to be either supportive or highly supportive.

Worth noting is the percentage of respondents reporting neutrally about this item

(31.6%). Based on the scope of this study, one cannot know why this percentage of

teachers reported in a neutral fashion. Could it be that they are unsure or that they do not

want to respond either positively or negatively? Could this indicate some confusion with

the word "innovation"? Worth noting, however is the low percentage of teachers who

reported negatively. Only 8.8% of teachers reported that the faculty was either not

supportive or highly non-supportive of innovations or new programs. The large

proportion of neutral responses could indicate a potential barrier. Nevertheless, this is unclear.

When asked how often staff assess strengths and weaknesses of the RAMP math program that lead to necessary changes, teachers reported quite differently. Approximately 19% reported that this usually happens, 19.3% reported it rarely happens, and 15.8% reported it never happens. A larger percentage reported that assessment such as this happens, but only sometimes (45.6%). One could argue that over 80% of teachers surveyed have the perception that the program is not assessed for strengths and weaknesses often enough. This is a potential barrier to continued sustainability.

Vision and planning. The fifth category on the OAS is related to vision and planning and contained items centered on collaborative development of a vision for reform, solicitation and responsiveness to feedback from stakeholders, encouragement of open discussion, and collaborative problem solving. Table 6 includes questions from the OAS survey related to vision and planning.

Table 6

Organizational Assessment Survey responses conveying the perceptions of teachers

regarding Vision and Planning

Survey Question	% Positive	% Unknown	% Negative	General Strength	Potential Barrier
#24a. The district collaboratively develops a vision and goals with staff, parents, and students.	50.0	5.4	44.7		X
#24b. The district solicits and is responsive to feedback from stakeholders.	42.9	17.9	39.3		X
#24c. The district encourages open discussion of problems and issues among staff.	58.9	3.6	37.5		X
#24d. The district encourages collaborative problem solving and inquiry into the effectiveness of its operations (programs, policies, processes).	53.6	7.1	39.3		X

As in previous categories, this one shows some potential barriers to long-term

sustainability. One half of respondents reported positively that the district collaboratively

develops a vision and goals with different stakeholders, while 44.7% of respondents

reported negatively about this element. A slightly higher proportion of respondents

reported positively about encouragement for open discussion (58.9%) and collaborative

problem solving (53.6%). Although these percentages are not low, the fact that over one-

third of those surveyed expressed negative feelings about these elements is somewhat

concerning. The difference could indicate that some teachers engage in these activities

and others do not. Also concerning is the proportion of teachers reporting an unknown

(17.9%) or negative (39.3%) response when asked about whether the district is

responsive to feedback from stakeholders. This could indicate that teachers do not know whether their feedback is heard or valued.

Effective leadership. The sixth category on the OAS is effective leadership and contains items specific to structures, guidance, alignment to vision and goals, engagement in decision making, promotion of change through dialogue and collaboration, and knowledgeable leadership. Table 7 includes items from the Organizational Assessment Survey based on the category of effective leadership.

Table 7

Organizational Assessment Survey responses conveying the perceptions of teachers regarding Effective Leadership

Survey Question	% Positive	% Unknown	% Negative	General Strength	Potential Barrier
#25a. The district provides a structure (common time and place) to support teacher collaborations aimed at improving student learning.	87.5	1.8	10.7	X	
#25b. The district provides guidance (processes, modeling, coaching, resource materials, expert advice, or supervision) to support meaningful teacher collaborations about student learning.	78.6	0	21.5	X	
#25c. District activities, analyses, and decision making are aligned to vision/ goals.	69.6	21.4	8.9	X	
#25d. The district engages faculty and staff in decision making.	49.1	9.1	41.8		X
#25e. The district promotes change through dialogue and collaboration.	44.4	7.4	48.2		X
#25f. Dist. leaders are knowledgeable of school imp. issues/initiatives.	76.8	10.7	12.5	X	

The data indicated that there are strengths and potential barriers within the effective leadership category. Approximately 42% of teachers reported negatively about engagement of faculty and staff in decision making. These results are consistent with the overall results in the decision-making category. Approximately 48% of teachers also reported negatively about the promotion of change through dialogue and collaboration. This item is consistent with results in the vision and planning category. Also consistent with other items about vision, is the proportion of teachers reporting an unknown response (21.4%) on question 25c- *District activities, analysis, and decision-making are aligned to vision/goals.* All three of these items further highlight potential barriers centered on engagement of all stakeholders, promotion of change through dialog, and vision.

A high proportion of teachers reported positively about the structure for supporting teacher collaboration (87.5%) and about the guidance provided to support such collaboration (78.6%). This could be due, in part, to the Professional Learning Community (PLC) structures that were put in place when reform began. It might also be related to the support provided to PLC leaders throughout the life of the RAMP math project. Additionally, a high proportion of teachers reported feeling that district leaders were knowledgeable about improvement issues and initiatives (76.8%). These are strengths to reform implementation.

Accountability. The seventh category on the Organizational Assessment Survey is accountability and included items centered on expectations for student academic achievement, priorities relative to student success, sharing of student achievement data, taking of personal responsibility, systems for encouragement of staff and student

achievement, and monitoring of progress through teacher evaluation. Table 8 consists of

items on the OAS survey associated with accountability.

Table 8

Organizational Assessment Survey responses conveying the perceptions of teachers

regarding Accountability

Survey Question	% Positive	% Unknown	% Negative	General Strength	Potential Barrier
#26a. Administrators and faculty in our district usually maintain high expectations for student academic achievement.	98.2	0	1.8	X	
#26b. Student success, not just test scores, is the top priority in this district.	74.5	3.6	21.8	X	
#26c. The district shares individual student achievement data (broken down by sub-group, school, district, and state results) with all teachers.	85.5	3.6	10.9	X	
#26d. Administrators and faculty take personal responsibility for student performance; excuse-making and blaming failures on circumstances or people is rare.	87.3	1.8	10.9	X	
#26e. The district uses reward, consequence, and recognition systems to encourage high levels of staff and student achievement.	56.4	14.5	29.1		X
#26f. The Principal regularly conducts teacher evaluation to monitor progress on goals and student achievement.	94.5	0	5.5	X	

Many of the elements within this category can be classified as strengths. Specifically, 98.2% of teachers reported that they either strongly agreed with or agreed with the statement that administrators and faculty usually maintain high expectations for academic achievement. Of the 98.2 percent of teachers in agreement, 67.3% strongly agreed with this statement. A slightly lower proportion of teachers (74.5%) agreed with the statement that student success was not just measured by test scores. 85.5% of teachers reported positively that the district shares achievement data with all teachers, which is broken down by sub-group and location, and 87.3% of teachers reported positively that administrators and faculty take personal responsibility for student performance. Finally, 94.5% of teachers reported that the Principal regularly conducts teacher evaluation to monitor progress on goals and student achievement. All in all, one could assume that the accountability category is an overall strength relative to the RAMP math reform.

The one potential concern identified in this category was associated with item #25e- *The district uses reward, consequences, and recognition systems to encourage high levels of staff and student achievement.* Approximately 29% of teachers reported negatively with regards to this statement and 14.5% reported that this was unknown. Due to the moderate proportion of negative responses and unknown responses, it is difficult to determine whether this is truly a barrier.

Using data for continuous improvement. The eighth category on the OAS is associated with the use of data for continuous improvement and includes items centered on monitoring and reporting of data, measurable goals, comparing of student achievement results, and identification of priority needs. Table 9 identifies items associated with this category.

Table 9

Organizational Assessment Survey responses conveying the perceptions of teachers

regarding the Use of Data for Continuous Improvement

Survey Question	% Positive	% Unknown	% Negative	General Strength	Potential Barrier
#27a. The district requires periodic monitoring and reporting of effectiveness data.	67.3	14.5	18.1		X
#27b. The district requires programs to have measurable goals.	78.2	9.1	12.7	X	
#27c. The district often compares our student achievement results to other similar districts as a measure of our success.	87.0	7.4	5.6	X	
#27d. The district identifies and addresses priority needs based on data analysis.	85.2	11.1	3.7	X	
#27e. The district encourages the use of data to identify needs throughout the system.	86.8	9.4	3.8	X	

Like the accountability category, this category is associated with several

strengths. Approximately 78% of teachers reported positively that the district requires

programs to have measurable goals; 87% reported that the district often compares student

data with the data from other districts in order to measure success; 85.2% of respondents

agreed positively that the district identifies and addresses priority needs based on data

analysis; and 86.8% agreed positively to the statement that the district encourages the use

of data to identify needs throughout the system. Conversely, only 67.3% of teachers

reported positively that the district requires periodic monitoring and reporting of program

effectiveness data. While this proportion is relatively high, the moderate proportion of

unknown responses (14.5%) and/or negative responses (18.1%) is worth noting. Whether this is a barrier is unclear. This could be an example of a systems-level element and one with which teachers are somewhat unaware. All in all, one could assume that overall use of data for continuous improvement is a strength.

Valuing diversity. The ninth category on the Organizational Assessment Survey is centered on the valuing of diversity and includes items about the representative nature of district leadership and staff, climate and respect for individual differences, treatment of others, and upholding of consistently high standards. Table 10 reflects items from the OAS relative to the valuing of diversity.

Table 10

Organizational Assessment Survey responses conveying the perceptions of teachers regarding the Value for Diversity

Survey Question	% Positive	% Unknown	% Negative	General Strength	Potential Barrier
#28a. Diversity is valued in our district.	85.2	3.7	11.2	X	
#28b. The leadership and faculty are culturally representative of the community.	52.9	3.9	43.1		X
#28c. A climate of caring and respect for individuals, despite social, cultural, religious, ethnic, physical, or other differences permeates operations in our district.	90.7	1.9	7.5	X	
#28d. Faculty in this district treat colleagues, students, and parents with dignity despite circumstances.	94.4	0	5.6	X	
#28e. District leaders hold staff accountable for upholding consistently high standards for all individuals and groups.	96.3	0	3.8	X	

For the most part, teacher perception specific to items in this category was positive. A high proportion of teachers reported that diversity is valued (85.2%) and that a climate of caring permeates the district (90.7%). Additionally, a high proportion of teachers reported that faculty treat colleagues, students, and parents with dignity (94.4%) and that district leaders hold staff accountable for upholding consistently high standards for all individuals and groups (96.3%).

The one barrier identified by teachers was associated with the actual diversity of the leadership and faculty. Only 52.9% of teachers believe the leadership and faculty to be culturally representative of the community. This is something worth noting, especially as it relates to relationships with parents and community members. Overall, one can assume that this particular category is a strength relative to district reform.

Climate. The tenth category on the OAS is climate. This category contains items specific to the establishment and maintenance of relationships with staff, treatment that builds trust, assessment of climate, and establishment and enforcement of policies and practices that foster climate. Table 11 shows items from the Organizational Assessment Survey related to climate.

Table 11

Organizational Assessment Survey responses conveying the perceptions of teachers

regarding Climate

Survey Question	% Positive	% Unknown	% Negative	General Strength	Potential Barrier
#29a. District leaders establish and maintain strong relationships with staff.	70.4	5.6	24.1	X	
#29b. District leaders treat staff, parents, and students in a manner that builds trust.	81.5	0	18.6	X	
#29c. The district regularly assesses the district/school climate.	31.5	33.3	35.2		X
#29d. The district establishes policies and enforces practices to foster a safe, positive learning climate for staff.	79.6	3.7	16.7	X	

In similar fashion to the valuing of diversity, most of the elements in this category

were associated with strengths. A high proportion of teachers (70.4%) reported positively

that district leaders establish and maintain strong relationships with staff. Additionally, a

high proportion of teachers (81.5%) reported that district leaders treat staff, parents, and

students in a manner that builds trust.

Although 79.6% of teachers reported that the district has policies in place to foster

and maintain a safe and positive learning climate for staff, 35.2% of teachers reported

negatively about regular assessment of district/school climate. Another 33.3% of

respondents reported that regular assessment of district/school climate was unknown. The

difference between the proportion of positive responses related to the establishment and

enforcement of policies that foster climate and the negative and unknown responses

related to assessment of climate is interesting. The negative and unknown responses in
this category may signal a system-wide disconnect and potential barrier in the climate
category. However, generally speaking, one could assume this overall category is a
strength.

Learning organizations. The eleventh category on the OAS is associated with
learning organizations and contained items specific to nurturing of leadership
capabilities, encouragement of problem solving, promotion of change through dialogue,
professional development, and fostering of support and growth. Table 12 contains items
on the OAS associated with learning organizations.

Table 12

Organizational Assessment Survey responses conveying the perceptions of teachers

regarding Learning Organizations

Survey Question	% Positive	% Unknown	% Negative	General Strength	Potential Barrier
#30a. The district nurtures leadership capabilities across the organization.	72.2	13.0	14.9	X	
#30b. The district encourages problem solving that involves risk-taking.	40.7	33.3	25.9		X
#30c. The district promotes change through dialogue and collaboration rather than through district directives.	46.3	9.3	44.5		X
#30d. The district offers effective and relevant professional development.	87.0	0	13.0	X	
#30e. The district fosters an environment of mutual cooperation, emotional support and personal growth throughout the organization.	75.9	5.6	18.5	X	

Teachers reported positively about the nurturing of leadership capabilities (72.2%) and about the fostering of an environment for mutual cooperation, emotional support, and personal growth (75.9%). A high proportion of teachers also reported that the district offers effective and relevant professional development (87.0%). Of the 87% of teachers in agreement with this statement, 57.4% reported that they agreed rather than strongly agreed. This is consistent with previous questions about professional development, and might indicate that although the PD was effective and relevant, it was more effective and relevant for some teachers than for others.

Two barriers were identified in this category. The first barrier was associated with the promotion of change through dialogue and collaboration. While 46.3% of teachers agreed with this statement, 44.5% disagreed that change is promoted through dialogue and collaboration. Again, this is consistent with many of the questions in the decision-making category. It might also be consistent with teacher perception about the level of building- and district-administrator involvement and influence in change efforts. As mentioned earlier, a relatively high proportion of teachers reported that principals and the superintendent have a measurable or major influence on this reform (66.6% and 66.7% respectively). Conversely, a relatively high proportion of teachers reported that they had either slight to no influence on this reform (60.7%). This could be an indication that teachers see this reform as a top-down directive.

The second barrier identified in the learning organization category was associated with problem solving and risk taking. Most notable about this particular element is the proportion of unknown responses (33.3%). The combination of unknown responses and negative responses (25.9%) might signal a potential barrier. This is important to note,

especially for this particular reform. Because the RAMP math program is somewhat unique in terms of strategies and practices used, it requires that teachers feel comfortable taking risks when teaching. Fear of risk-taking could be a potential barrier to future sustainability.

Systems thinking. The twelfth category in the OAS is associated with systems thinking and includes items specific to district decision making, structuring of systems that aid in problem solving, engagement in meaningful dialogue, analysis of impact on the system, responsibility for solving problems, and involvement of outside resources. Table 13 shows items associated with systems thinking.

Table 13

Organizational Assessment Survey responses conveying the perceptions of teachers

regarding Systems Thinking

Survey Question	% Positive	% Unknown	% Negative	General Strength	Potential Barrier
#31a. District leaders make decisions that shift problems from one part of the system to another.	24.1	38.9	31.5		X
#31b. The district encourages schools to structure staff time and available resources to support brainstorming and creative problem solving.	77.8	3.7	18.6	X	
#31c. District leaders engage concerned parties in meaningful dialogue to address issues, rather than settling on quick-fixes for individual problems.	53.7	24.1	22.2		X
#31d. The district analyzes issues for their impact on other parts of the system.	45.3	43.4	11.3		X
#31e. District and school leadership teams take responsibility for solving problems and avoiding blame as a solution.	72.2	22.2	5.6	X	
#31f. The district organizes opportunities for faculty to interact with educators outside of the district.	18.5	24.1	67.4		X

The results for this category were somewhat mixed. A high proportion of teachers

(77.8%) reported positively that the district encourages schools to structure time and

resources to support brainstorming and creative problem solving. Although not quite as

high, this percentage was relatively consistent with the proportion of positive responses

provided for question 25a (87.5%) in the effective leadership category which states: *The*

district provides a structure to support teacher collaborations aimed at improving student learning and could be related to the PLC structures in place in all four primary schools. This element is a strength. A second strength was associated with the high proportion of teachers (72.2%) reporting positively that the district and school leadership teams take responsibility for solving problems and avoiding blame. These results were relatively consistent with the proportion of positive responses provided (87.3%) for question #26d in the accountability section which states: *Administrators and faculty take personal responsibility for student performance; excuse-making and blaming failures on circumstances or people is rare.*

As is the case with other systems-level categories, there may be some barriers within this category that are not necessarily associated with negative responses, but instead are associated with unknown responses. For example, a moderate proportion of unknown responses was observed for question 31a. Specifically, 38.9% of teachers reported that they do not know whether leaders make decisions that shift problems from one part of the system to another. In the case of this particular item, a negative response would be associated with healthy systems thinking. Rather than shifting problems from one part of a system to another, a healthy system would recognize the problem and address it. Approximately 31% of respondents responded negatively, and 24.1% responded positively. Due to the spread of responses across the response categories and the possibility that this question may be somewhat unclear to teachers, it is uncertain whether this item is a barrier to continued reform and long-term sustainability. This item might be reflective of a system-wide disconnect. Additionally, items 31c, 31d, 31e, and 31f all had somewhat high proportions of unknown responses. Several teachers reported

that they did not know about (a) the engagement of concerned parties in meaningful dialogue (24.1% unknown), (b) whether the district analyzes issues for their impact on other parts of the system (43.4% unknown), (c) whether district and school leadership teams take responsibility for solving problems (22.2% unknown), and (d) whether the district organizes opportunities for faculty to interact with educators outside of the district (24.1% unknown). All four of these elements might point to a disconnect between the work of teachers and the system-wide work of the district. This disconnect may be a potential barrier.

One might argue that item 31f is a potential barrier to continued reform. A high proportion of teachers (67.4%) reported that the district does not organize opportunities for faculty to interact with educators outside of the district. This is could be due to the fact that this district is the only district using the RAMP math program on a large scale. One other district has individuals who have received at least a minimal amount of RAMP math training, but the experience had by the teachers in this district is on a much smaller scale. It is likely that any support provided would yield minimal benefit. The lack of opportunities relative to interaction with outside school districts is due to the unique elements of this particular reform. That being said, one could argue that this item is a potential barrier.

Innovation and creativity. The final category on the Organizational Assessment Survey is associated with innovation and creativity. This category contains items related to time provided for creative thinking, solicitation of feedback from stakeholders, opportunities for meaningful discussion, flexibility, communication patterns, and support

for creative and innovative practices. Table 14 includes items from the Organizational

Assessment Survey that are associated with innovation and change.

Table 14

Organizational Assessment Survey responses conveying the perceptions of teachers

regarding Innovation and Creativity

Survey Question	% Positive	% Unknown	% Negative	General Strength	Potential Barrier
#32a. The district allows you to create time and opportunities for your own creative thinking.	24.1	11.1	64.8		X
#32b. The district solicits feedback from stakeholders concerning real and perceived barriers to creativity and innovation and then acts on this input to remove those barriers.	24.1	29.6	46.3		X
#32c. District leaders set meeting agendas that provide opportunities for meaningful discussion of important emergent issues.	63.0	7.4	29.6		X
#32d. District plans are flexible enough to allow leaders to move in unforeseen directions in response to unexpected events.	40.7	38.9	20.4		X
#32e. District communication patterns keep stakeholders informed in advance of issues and events allowing time to plan creative solutions.	37.0	37.0	25.9		X
#32f. District leaders, policies, and processes encourage faculty and administrators to try new ideas without fear of repercussions.	24.1	33.3	42.6		X
#32g. The district supports creative and innovative practices at all levels.	29.6	20.4	50.0		X

One might argue that this entire category is a barrier to future sustainability. A high proportion of teachers reported negatively (64.8%) when responding to item #32a, which was centered on time and opportunities being provided for creative thinking. In similar fashion, moderately high proportions of teachers responded negatively to items related to: (a) solicitation of feedback to perceived and real barriers to creativity and innovation (46.3%), (b) policies and processes that encourage the trying of new ideas without fear of repercussions (42.6%), and (c) district support for creative and innovative practices at all levels (50.0%). Additional barriers might be associated with high proportions of unknown responses for specific items in this category. For example, 38.9% of respondents reported that they did not know whether district plans were flexible enough to move in unforeseen directions. Thirty-seven percent of respondents reported that they did not know whether communication patterns keep stakeholders informed in advance of issues, and 33.3% reported that they did not know whether leaders, policies, and processes encourage faculty to try new ideas without repercussions. These items provided further credibility to the idea that there are some system-wide components that are unknown to a large enough proportion of teachers to be of potential concern for future sustainability.

Summary of descriptive data. To summarize the descriptive data, there were many strengths identified specific to the reform in the study district. First, a large proportion of teachers perceived the school and district to be supportive. They reported that they believe that diversity is valued and that the climate is positive in nature. Second, many teachers reported that they believe that the RAMP math program has led to a positive change in teaching practice and in student learning and believe that the program

has had a positive influence on instruction. Third, many teachers reported satisfaction with the district, school, grade-level and/or position. Fourth, a large proportion of teachers reported positively about many of the aspects related to effective leadership. They reported that there are structures in place that support brainstorming and facilitate learning within the organization. Finally, a high proportion of teachers reported positively about many of the elements in the accountability category. They reported that there is a sense of shared responsibility for student learning and that data is often used for continuous improvement.

Potential barriers were identified based on negative responses. First, many teachers reported dissatisfaction with the resources provided. Additionally, many reported that staff development was only somewhat effective. Second, many teachers reported dissatisfaction with the promotion of change through shared dialogue and reported that there is a lack of participation for key stakeholders in the decision-making process. Additionally, many teachers reported that there is a lack of assessment relative to strengths and weaknesses for the RAMP math program. Third, teachers reported that faculty and staff were not culturally representative of the community. Fourth, a higher proportion of teachers reported negative responses to many of the items in the innovation and creativity category. Potential barriers were also identified based on unknown responses. Data indicated a lack of system-wide awareness specific to the vision and planning for RAMP math. Data also indicated that there is a lack of awareness about system-wide structures and practices.

Correlational Analysis

A correlational analysis was completed to analyze potential associations between amount of reform experience and elements necessary for successful and sustainable reform. Two variables were investigated. The first variable was categorical in nature and was associated with number of years of reform implementation experience. Teachers were divided into two groups. Group one consisted of teachers with 0-3 years of implementation experience. Group two consisted of teachers with four years of implementation experience or more. The second variable was ordinal in nature and was associated with teacher perception relative to specific items on the Organizational Assessment Survey. Survey items were directly aligned with empirical research on Organizational Learning Theory (Leithwood et al., 2006) and Sustainability Theory (Coburn, 2003). Survey items were also used and validated by Alsbury (2008, 2012).

The researcher used Kendall's tau-b to investigate the strength and direction of association between each item on the OAS and teacher implementation experience. This nonparametric test statistic was used due to the small sample size and because of the potential for tied ranks. Prior to using Kendall's tau-b, the researcher checked to make sure the required assumptions were met. There are three assumptions that must be met, in order to be sure Kendall's tau-b yields valid results (Laerd Statistics, 2017). To address assumption #1, the researcher checked to ensure both variables were either ordinal or continuous in nature. Because the researcher was looking at the association between each item on the OAS and amount of reform experience, this required that the researcher check each item on the OAS to be sure that all items met this assumption. To address the second assumption, the researcher checked to be sure the variables represented paired

observations. To address the third assumption, the researcher checked to be sure that the

relationship was monotonic in nature. A Kendall's tau-b correlational analysis was run to

determine the relationship between number of years of implementation experience with

the RAMP math program and each item (76 total) on the Organizational Assessment

Survey. Of the 76 items, a statistically significant association was found for 18 survey

items.

1. **Statistically Significant Item #10b- Impact of Program on Your Teaching**
   (Overall System Strength): There was a weak correlation between number of
   years of implementation experience and perceived change of RAMP math on
   an individual's teaching amongst 56 participants, which was statistically
   significant ($\tau_b = -.285$, $p < .05$). Figure 1 shows the data for both groups of
   teachers.
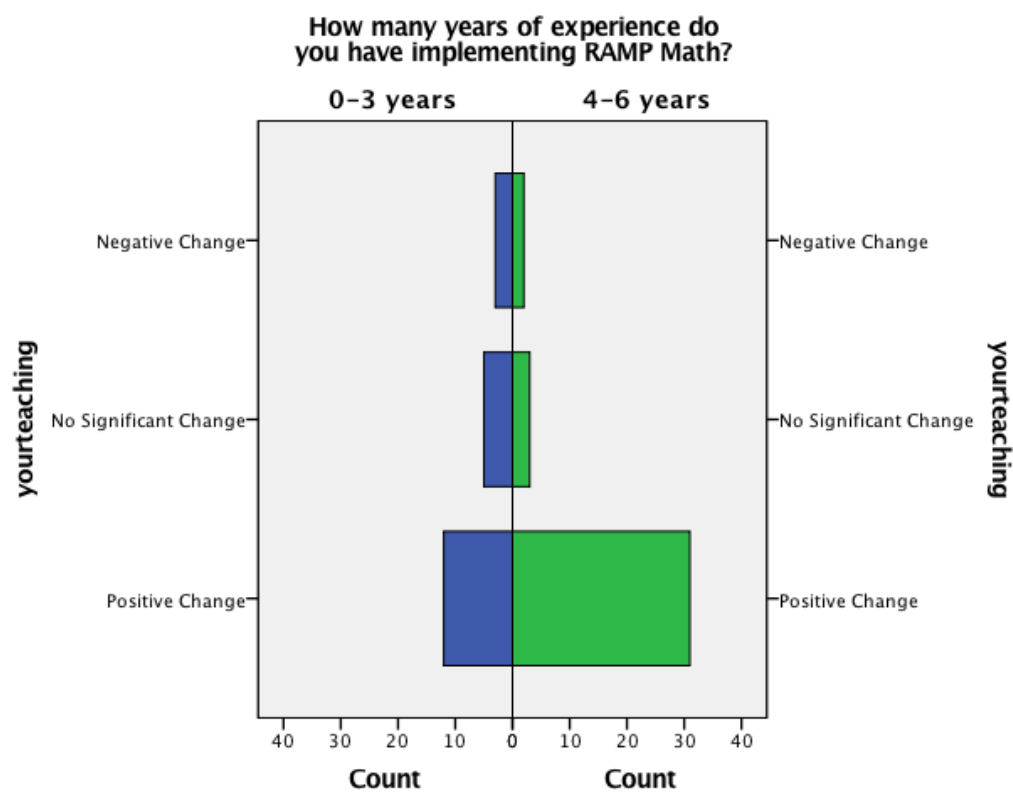
Figure 1. Organizational Assessment Survey responses conveying the perceptions of teachers regarding type of change the RAMP math program has likely had on your teaching.

Those with four or more years of reform implementation experience reported more frequently that the RAMP math program is likely resulting in a positive change to their teaching. Those with three years of implementation experience or less reported more frequently that the program is likely resulting in no significant change to their teaching. This correlation supports the alternative hypothesis, which stated there is a statistically significant association between teacher experience and level of agreement for specific items on the OAS.

2. **Statistically Significant Item #11a- General Level of Satisfaction with Your Administration (Overall System Barrier):** There was a moderate

correlation between number of years of implementation experience and general level of satisfaction with an individual's administration amongst 57 participants, which was statistically significant ($\tau_b = 0.379$, $p < .01$). Figure 2 shows data for item #11a.

Figure 2. Organizational Assessment Survey responses conveying the perceptions of teachers regarding general level of satisfaction with your administration.

Those with more implementation experience reported less satisfaction with their administration. Because there is an increased amount of dissatisfaction amongst a proportion of teachers with four or more years of implementation experience, this could be more of a barrier for teachers with more implementation experience than with those with less implementation experience. This supports the alternative hypothesis, which states there is a statistically significant association between level of agreement for

specific items on the Organizational Assessment Survey and teachers with differing

levels of implementation experience.

3. **Statistically Significant Item #11b- General Level of Satisfaction with Your District (Overall System Strength):** There was a moderate correlation between number of years of implementation experience and general level of satisfaction with your district amongst 57 participants, which was statistically significant ($\tau_{b} = 0.382$, $p < .01$). Figure 3 shows the data for item #11b.

Figure 3. Organizational Assessment Survey responses conveying the perceptions of teachers regarding general level of satisfaction with your district.

Those with more implementation experience reported more dissatisfaction and/or a neutral level of satisfaction with their district. Although this item was identified as a

system-wide strength, this could indicate that overall satisfaction with the school may be a potential barrier for a proportion of teachers with more implementation experience. This supports the alternative hypothesis, which stated there is a statistically significant association between level of agreement for specific items on the Organizational Assessment Survey and teachers with differing levels of implementation experience.

4. **Statistically Significant Item #11c- General Level of Satisfaction with Your School (Overall System Strength):** There was a weak correlation between number of years of implementation experience and general level of satisfaction with your school amongst 56 participants, which was statistically significant ($\tau_b = 0.298$, $p < .05$). Figure 4 shows the data for item #11c.
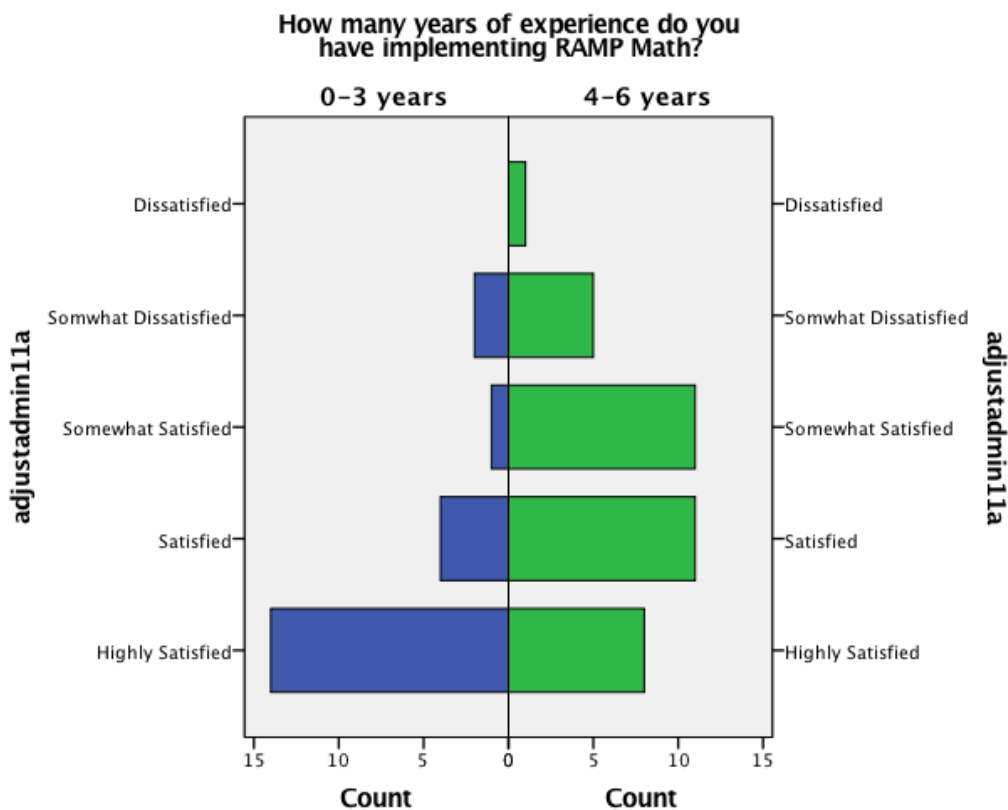

Figure 4. Organizational Assessment Survey responses conveying the perceptions of teachers regarding general level of satisfaction with your school.

Those with more implementation experience reported slightly less satisfaction with their school. As was the case with district satisfaction, satisfaction with your school was identified as an overall strength. However, this data could indicate that overall satisfaction with the school may be a potential barrier for a proportion of teachers with more implementation experience and/or with teachers expressing dissatisfaction with their school. This supported the alternative hypothesis, which stated there is a statistically significant association between level of agreement for specific items on the Organizational Assessment Survey and teachers with differing levels of implementation experience.

5. **Statistically Significant Item #11e- General Level of Satisfaction with Resources Provided (Overall System Barrier):** There was a weak correlation between number of years of implementation experience and general level of satisfaction with resources provided amongst 57 participants, which was statistically significant ($\tau_b = 0.268$, $p < .05$). Figure 5 shows the data for item #11e.
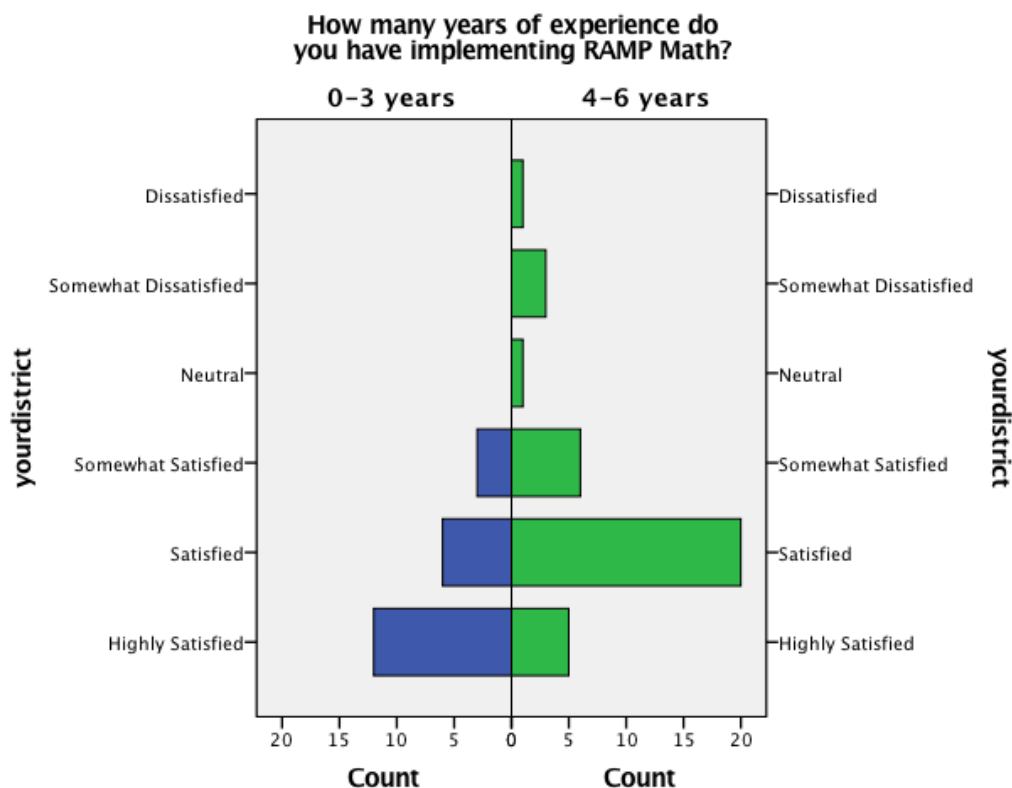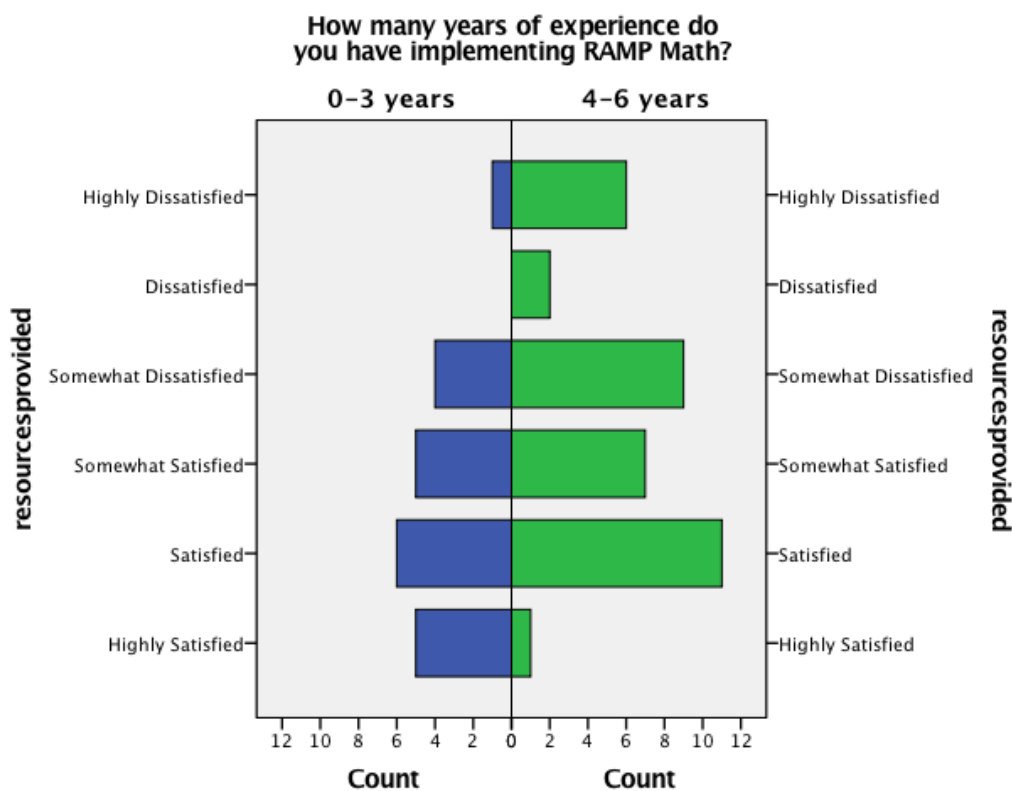
Figure 5. Organizational Assessment Survey responses conveying the perceptions of teachers regarding general level of satisfaction with resources provided.

Those with more implementation experience reported more dissatisfaction with the resources provided. This item was identified as an overall barrier. Although both groups appeared to be less satisfied with this element than others, this analysis showed a higher level of dissatisfaction for a higher proportion of teachers with more implementation experience. This supported the alternative hypothesis, which stated there is a statistically significant association between level of agreement for specific items on the Organizational Assessment Survey and teachers with differing levels of implementation experience.

6. **Statistically Significant Item #11f- General Level of Satisfaction with Support from Parents (Overall System Barrier):** There was a weak correlation between number of years of implementation experience and general level of satisfaction with support from parents amongst 55 participants, which was statistically significant ($\tau_b = 0.275$, $p < .05$). Figure 6 shows the data for item #11f.
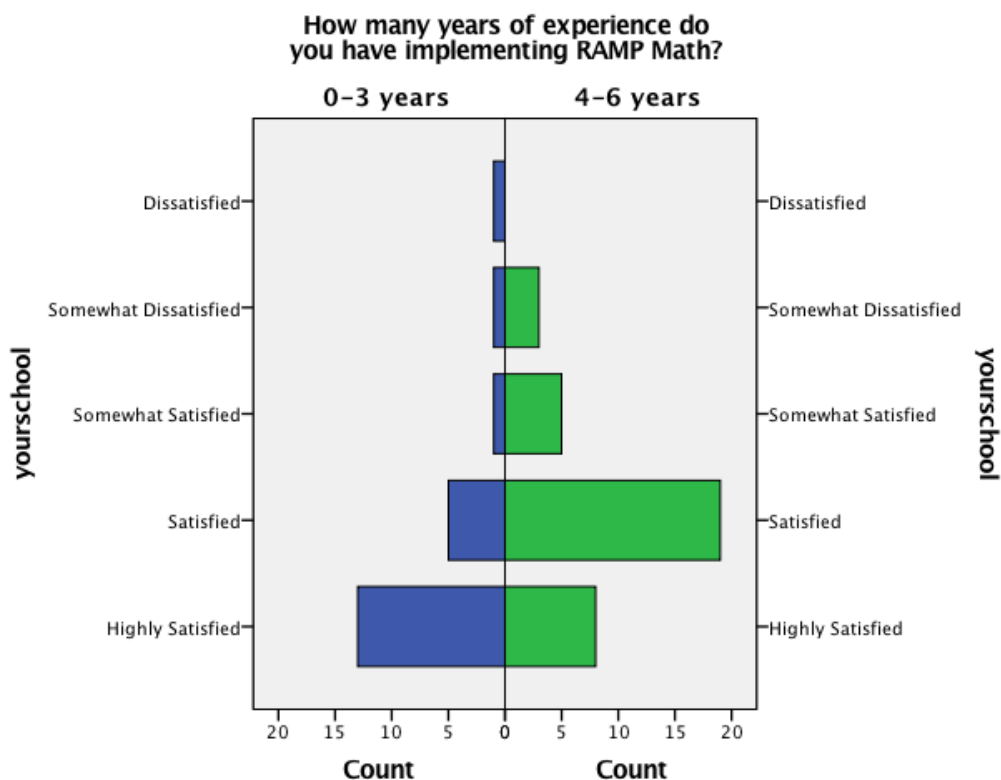

Figure 6. Organizational Assessment Survey responses conveying the perceptions of teachers regarding general level of satisfaction with support from parents.

Those with more implementation experience reported more dissatisfaction with support provided from parents. Again, this element was identified as an overall barrier. This analysis indicated that the barrier might be slightly more significant for a proportion of teachers with more implementation experience. This supported the alternative

hypothesis, which stated there is a statistically significant association between level of agreement for specific items on the Organizational Assessment Survey and teachers with differing levels of implementation experience.

7. **Statistically Significant Item #14- Influence of District Goals for RAMP Math on Your Instruction (Overall System Strength):** There was a moderate correlation between number of years of implementation experience and perceived influence of district goals for RAMP math on an individual's instruction amongst 57 participants, which was statistically significant (τ_{b} = -.303, p < .05). Figure 7 shows the data for both groups of teachers.
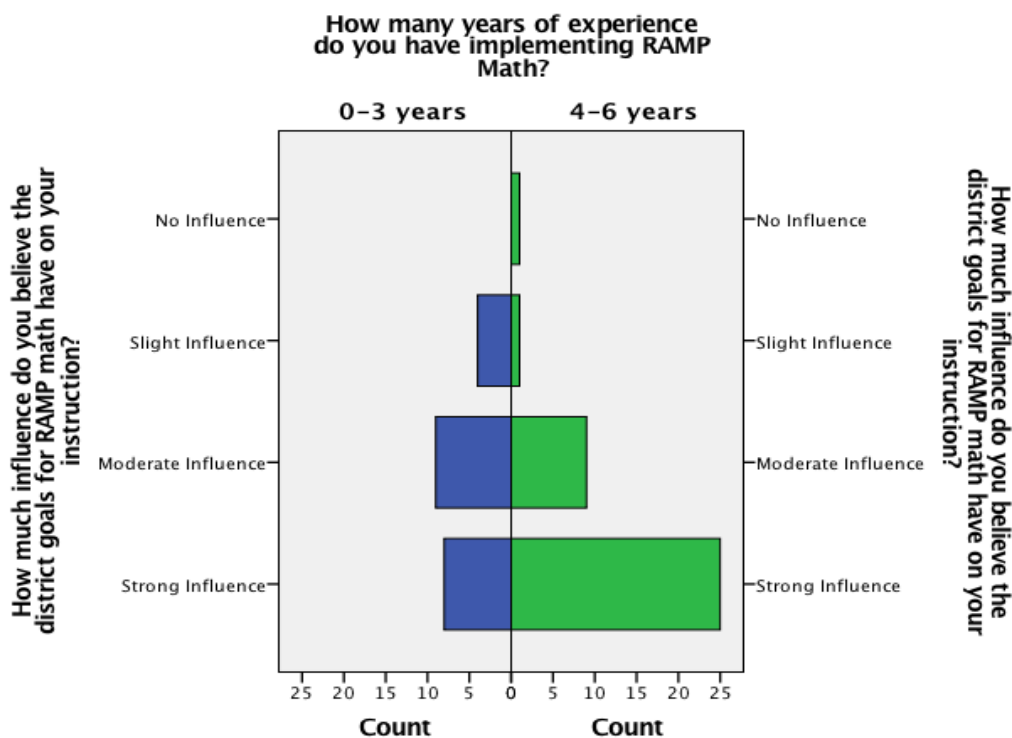
Figure 7. Organizational Assessment Survey responses conveying the perceptions of teachers regarding influence of district goals for RAMP math on your instruction.

Those with four or more years of reform implementation experience reported more frequently that they believe the district goals for RAMP math have a strong

influence on instruction. This item was identified as an overall strength. This analysis

indicated that it may be more of a strength for teachers with more implementation

experience than for those with less implementation experience. This supported the

alternative hypothesis, which stated there is a statistically significant association between

teacher experience and level of agreement for specific items on the OAS.

8. **Statistically Significant Item #15g- Involvement and Influence of Parents or Community Members in Decision Making:** There was a weak correlation between number of years of implementation experience and perceived involvement and influence of parents and community members in district decision making amongst 57 participants, which was statistically significant ($\tau_{b =}$ -.254, $p < .05$). Figure 8 shows the data for both groups of teachers.
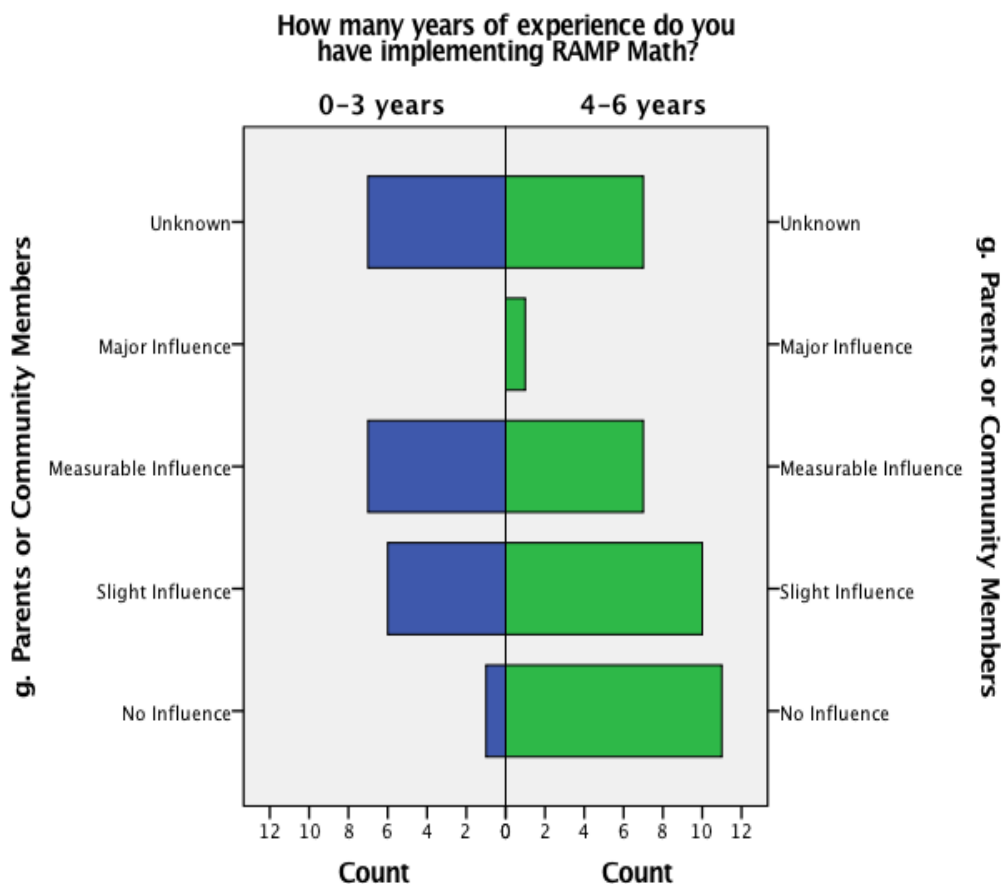
Figure 8. Organizational Assessment Survey responses conveying the perceptions of teachers regarding involvement and influence of parents in district decision making.

Those with four or more years of reform implementation experience reported more frequently that they believe parents have less influence in district decision making. This supported the alternative hypothesis, which stated there is a statistically significant association between teacher experience and level of agreement for specific items on the OAS.

9. **Statistically Significant Item #26d- Accountability: Personal Responsibility for Student Performance: (Overall System Strength):** There was a moderate correlation between number of years of implementation experience and perceived level of agreement with the statement that

Administrators and faculty take personal responsibility for student

performance… amongst 55 participants, which was statistically significant (τ_b
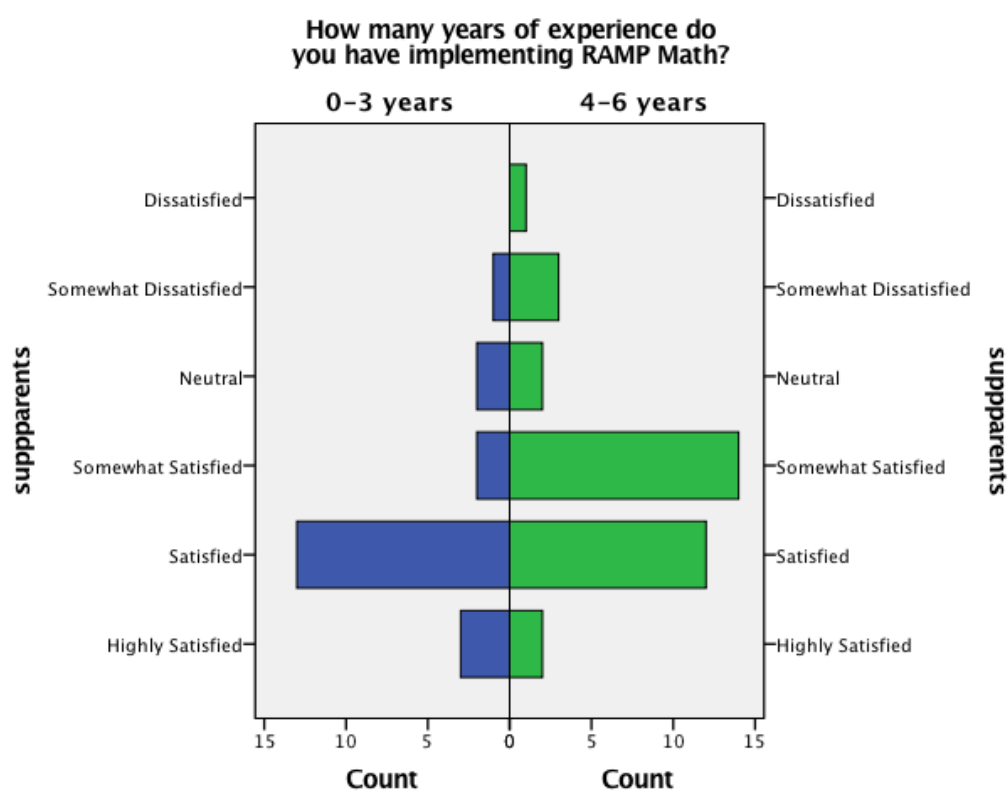
$_= 0.321$, $p < .05$). Figure 9 shows the data for item #26d.

Figure 9. Organizational Assessment Survey responses conveying the perceptions of

teachers regarding Accountability Item #26d- taking personal responsibility for student

performance.

Those with more implementation experience reported some level of disagreement

with this statement, while those in the 0-3 year category did not. Although this item was

identified as an overall strength, this analysis indicated that this item might be a potential

barrier for a proportion of teachers with more implementation experience. This supported

the alternative hypothesis, which stated there is a statistically significant association

between level of agreement for specific items on the Organizational Assessment Survey

and teachers with differing levels of implementation experience.

10. **Statistically Significant Item #26f- Accountability: Regular Teacher Evaluation by Principals to Monitor Progress on Goals and Student Achievement: (Overall System Strength):** There was a moderate correlation between number of years of implementation experience and perceived level of agreement with the statement that *The Principal regularly conducts teacher evaluation to monitor progress on goals and student achievement* amongst 55 participants, which was statistically significant ($\tau_b = 0.378$, $p < .01$). Figure 10 shows the data for item #26f.

Figure 10. Organizational Assessment Survey responses conveying the perceptions of teachers regarding Accountability Item #26f- regular evaluation of teachers to monitor goals and student performance.

Those with more implementation experience reported less strong agreement and more agreement with this statement. Additionally, those with more implementation experience reported disagreement with this statement, while those with less implementation experience did not. As is the case with the item 26d, this item was identified as an overall strength. This analysis indicated that principal evaluation of teachers might be a potential barrier for a small proportion of teachers with four or more years of reform implementation experience. This supported the alternative hypothesis, which stated there is a statistically significant association between level of agreement for specific items on the Organizational Assessment Survey and teachers with differing levels of implementation experience.

11. **Statistically Significant Item #28c- Valuing Diversity: A Climate of Caring and Respect Permeates Operations in Our District: (Overall System Strength):** There was a weak association between number of years of implementation experience and perceived level of agreement with the statement that *a climate of caring and respect for individuals, despite social, cultural, religious, ethnic, physical, or other differences permeates operations in our district* amongst 54 participants, which was statistically significant ($\tau_b = 0.262$, $p < .05$). Figure 11 shows the data for item #28c.

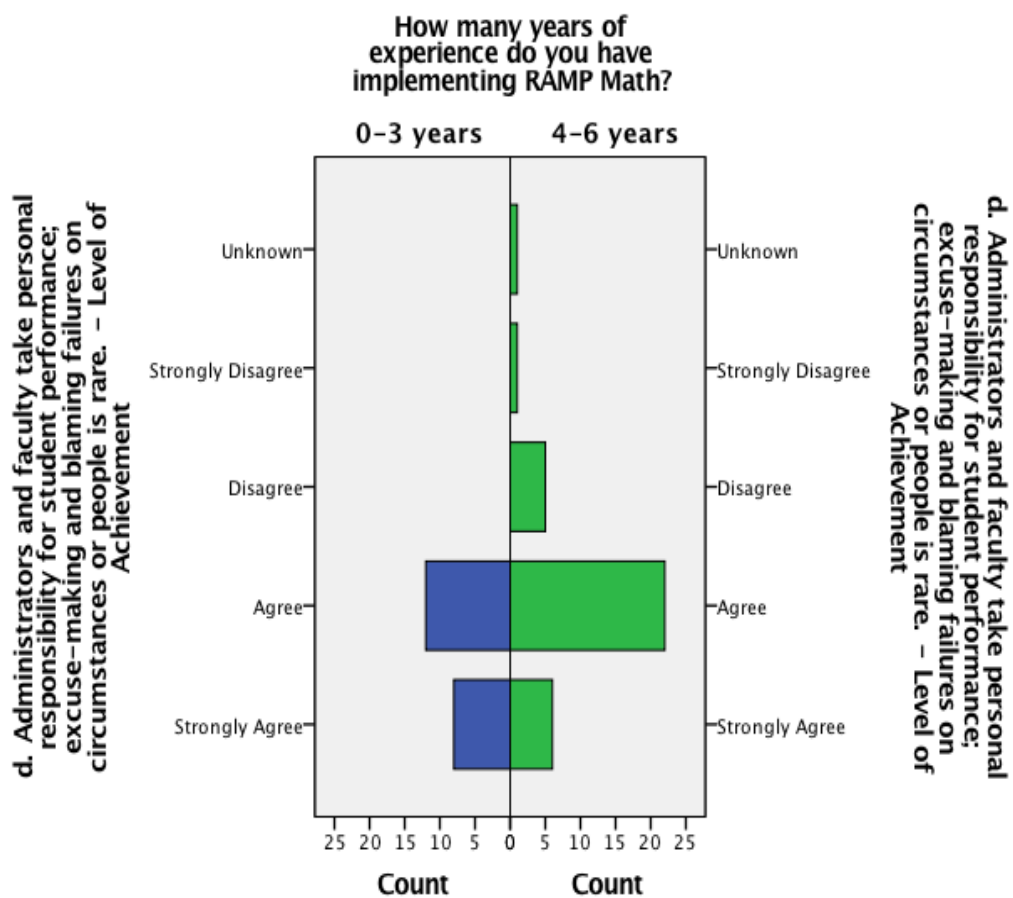*Figure 11*. Organizational Assessment Survey responses conveying the perceptions of teachers regarding Valuing Diversity Item #28c- climate of caring and respect permeates operations in the district.

Those with more implementation experience reported some level of disagreement and perception of unknown with this statement, while those with less implementation experience did not. This element was identified as an overall strength. This analysis indicated that this element might be a potential barrier for a proportion of teachers with more implementation experience. This supported the alternative hypothesis, which stated there is a statistically significant association between level of agreement for specific

items on the Organizational Assessment Survey and teachers with differing levels of

implementation experience.

12. **Statistically Significant Item #28d- Valuing Diversity: Faculty Treat**

   Colleagues, Students and Parents with Dignity Despite Circumstances:

   (Overall System Strength): There was a moderate correlation between

   number of years of implementation experience and perceived level of

   agreement with the statement that faculty treat others with dignity amongst 54

   participants, which was statistically significant ($\tau_b = 0.361$, $p < .01$). Figure 12

   shows the data for item #28d.

Figure 12. Organizational Assessment Survey responses conveying the perceptions of

teachers regarding Valuing Diversity Item #28d- treating others with dignity despite

circumstances.

A proportion of teachers with more implementation experience reported some level of disagreement with this statement, while those with less implementation experience did not. Although this item was identified as an overall strength, analysis of this element indicated that this item might be a potential barrier for a small proportion of teachers with four or more years of implementation experience. This supported the alternative hypothesis, which stated there is a statistically significant association between level of agreement for specific items on the Organizational Assessment Survey and teachers with differing levels of implementation experience.

13. **Statistically Significant Item #28e- Valuing Diversity: Accountability for Consistently High Standards: (Overall System Strength):** There was a moderate correlation between number of years of implementation experience and perceived level of agreement with the statement that district leaders hold staff accountable for upholding consistently high standards and expectations for all amongst 54 participants, which was statistically significant ($\tau_{b} = 0.348$, $p < .05$). Figure 13 shows the data for item #28e.

Figure 13. Organizational Assessment Survey responses conveying the perceptions of teachers regarding Valuing Diversity Item #28e- upholding consistently high standards for all.

A proportion of teachers with more implementation experience reported some level of disagreement with this statement, while those with less implementation experience did not. Although this item was identified as an overall strength, analysis indicated that this might be a potential barrier for a small proportion of teachers with more implementation experience. This supported the alternative hypothesis, which stated there is a statistically significant association between level of agreement for specific items on the Organizational Assessment Survey and teachers with differing levels of implementation experience.

14. **Statistically Significant Item #29b- Climate: Building Trust: (Overall**

System Strength): There was a weak correlation between number of years of

implementation experience and perceived level of agreement with the

statement that *district leaders treat staff, parents, and students in a manner*

that builds trust amongst 54 participants, which was statistically significant (τ_b

$_= 0.273$, $p < .05$). Figure 14 shows the data for item #29b.

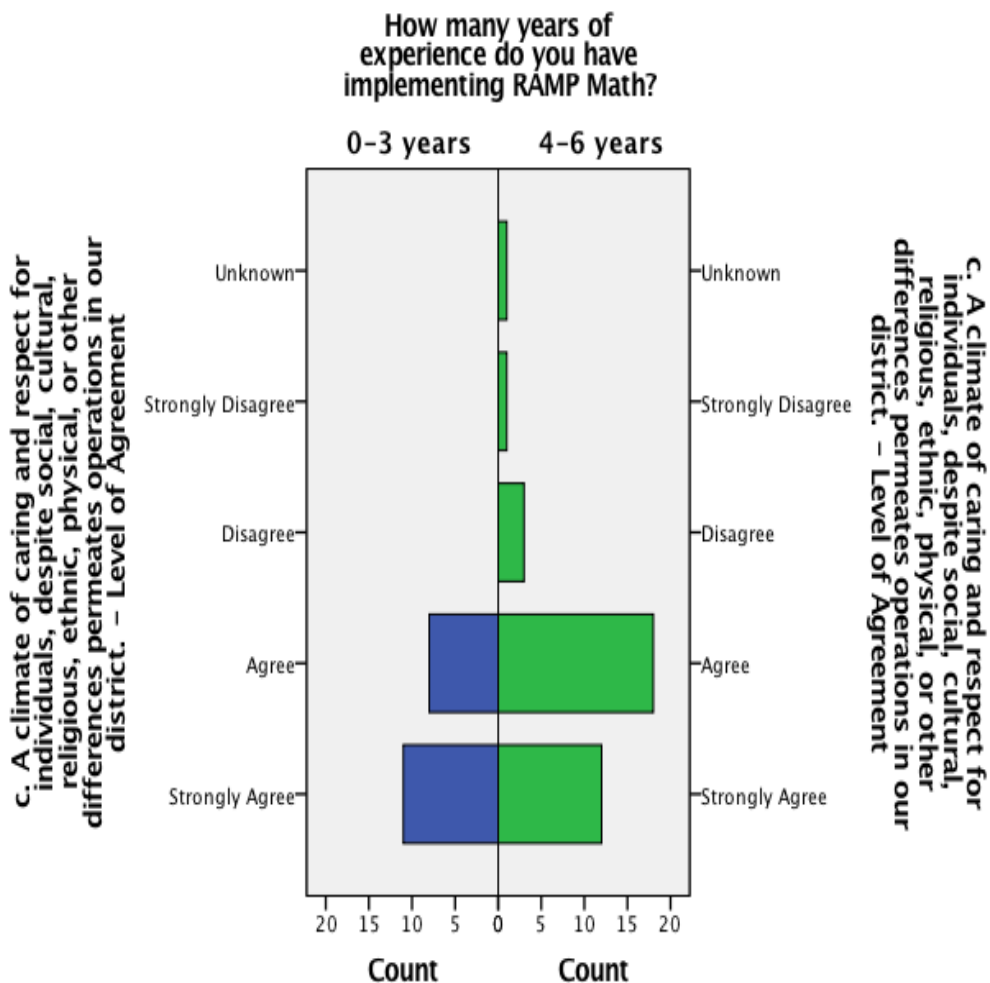*Figure 14.* Organizational Assessment Survey responses conveying the perceptions of

teachers regarding Climate Item #29b- building of trust.

Those with more implementation experience reported (a) less frequently that they

strongly agreed with this statement and (b) more frequently that they disagreed strongly

with this statement than those with less implementation experience. Although this item

was identified as an overall strength, this analysis indicated that it might be a potential

barrier for a small proportion of teachers with more implementation experience. This

supported the alternative hypothesis, which stated there is a statistically significant

association between level of agreement for specific items on the Organizational

Assessment Survey and teachers with differing levels of implementation experience.

15. **Statistically Significant Item #29d- Climate: Establishing Policies and**

   Enforcing Practices to Foster a Safe, Positive Learning Climate for Staff:

   (Overall System Strength): There was a moderate correlation between

   number of years of implementation experience and perceived level of

   agreement with the statement that the district establish policies and enforces

   practices to foster a safe environment amongst 54 participants, which was

   statistically significant ($\tau_b = 0.369$, $p < .01$). Figure 15 shows the data for item

   #29d.

Figure 15. Organizational Assessment Survey responses conveying the perceptions of

teachers regarding Climate Item #29d- policies and practices to foster a safe environment.

A proportion of teachers with more implementation experience reported some
level of disagreement and a perception of unknown with this statement, while those with
less implementation experience did not. Although this was identified as an overall
strength, analysis of this data indicated that this item might be a potential barrier for a
proportion of teachers with more implementation experience. This supported the
alternative hypothesis, which stated there is a statistically significant association between
level of agreement for specific items on the Organizational Assessment Survey and
teachers with differing levels of implementation experience.

16. **Statistically Significant Item #30e- Learning Organizations: Fostering an
    Environment of Mutual Cooperation, Support, and Growth: (Overall
    System Strength):** There was a weak correlation between number of years of
    implementation experience and perceived level of agreement with the
    statement that the district fosters an environment of mutual cooperation,
    emotional support, and personal growth amongst 54 participants, which was
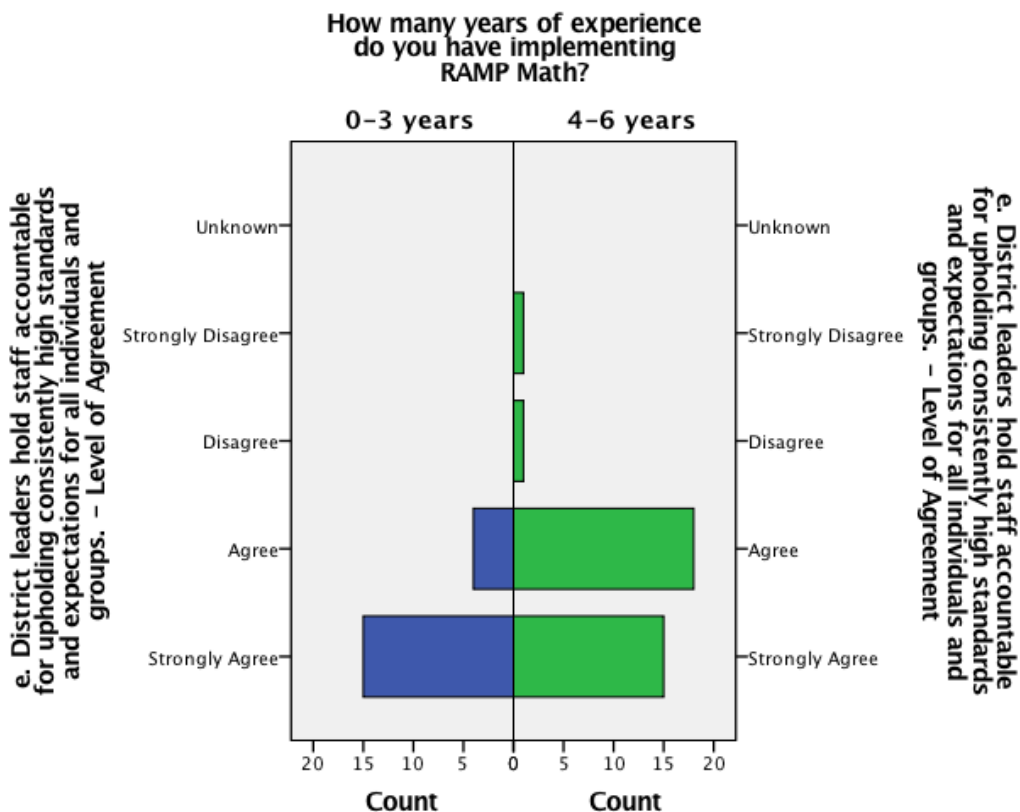   statistically significant ($\tau_b = 0.298$, $p < .05$). Figure 16 shows the data for item
    #30e.
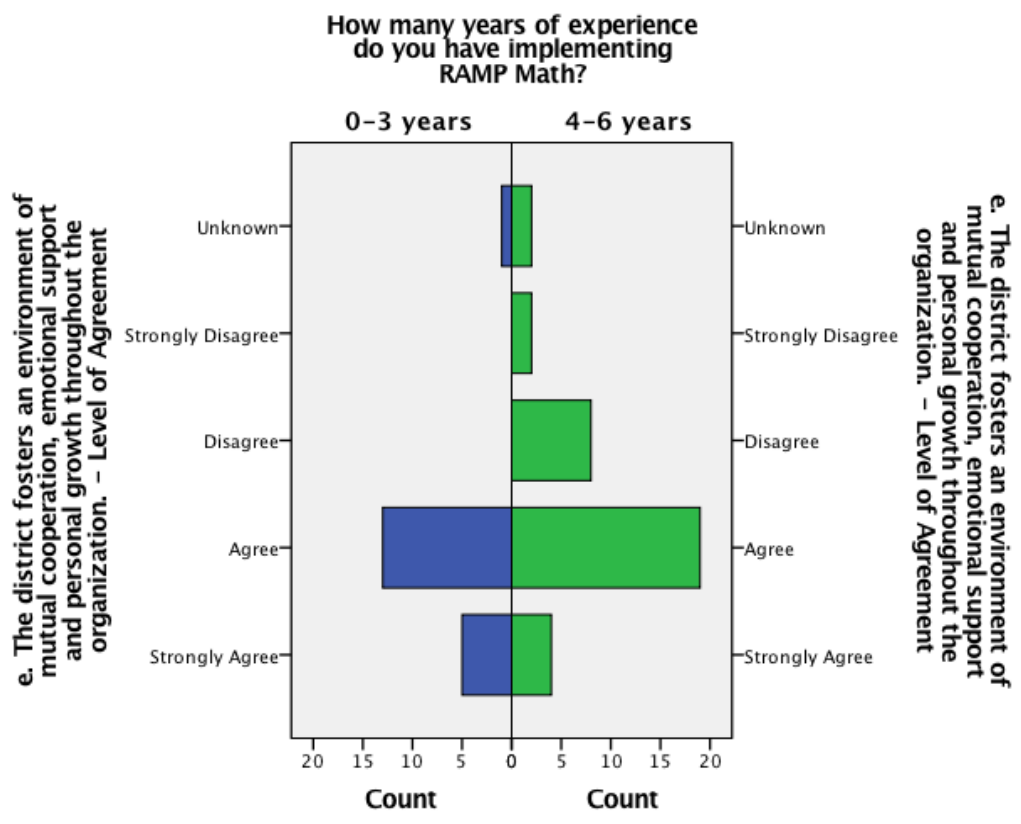
Figure 16. Organizational Assessment Survey responses conveying the perceptions of teachers regarding Learning Organizations Item #30e- fosters an environment of cooperation, support, and growth.

A proportion of teachers with more implementation experience reported some level of disagreement with this statement, while those with less implementation experience did not. While this item was identified as an overall strength, analysis of the data indicated that this element might be a potential barrier for a proportion of teachers with more implementation experience. This supported the alternative hypothesis, which stated there is a statistically significant association between level of agreement for specific items on the Organizational Assessment Survey and teachers with differing levels of implementation experience.

17. **Statistically Significant Item #31b- Systems Thinking: Encouraging Schools to Structure Staff Time and Resources to Support Brainstorming and Creative Problem Solving: (Overall System Strength):** There was a moderate correlation between number of years of implementation experience and perceived level of agreement with the statement that the district encourages schools to structure staff time and resources to support activities such as these amongst 54 participants, which was statistically significant ($\tau_b = 0.332$, $p < .05$). Figure 17 shows the data for item #31b.
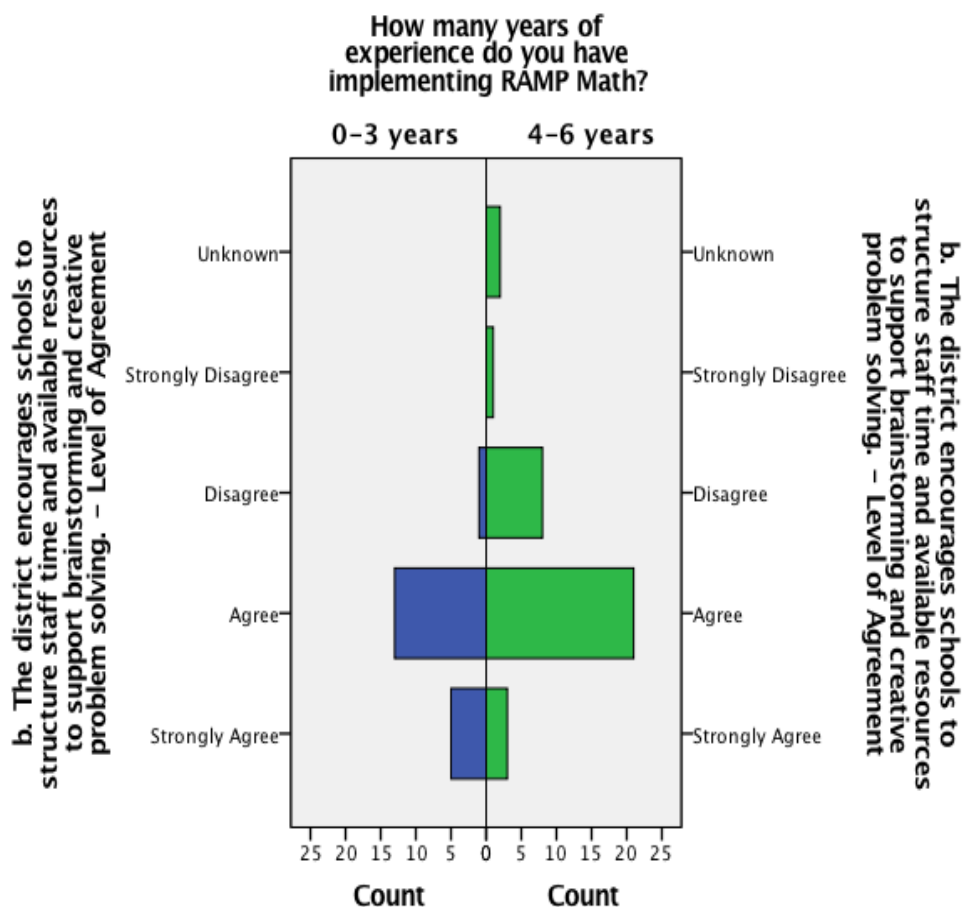
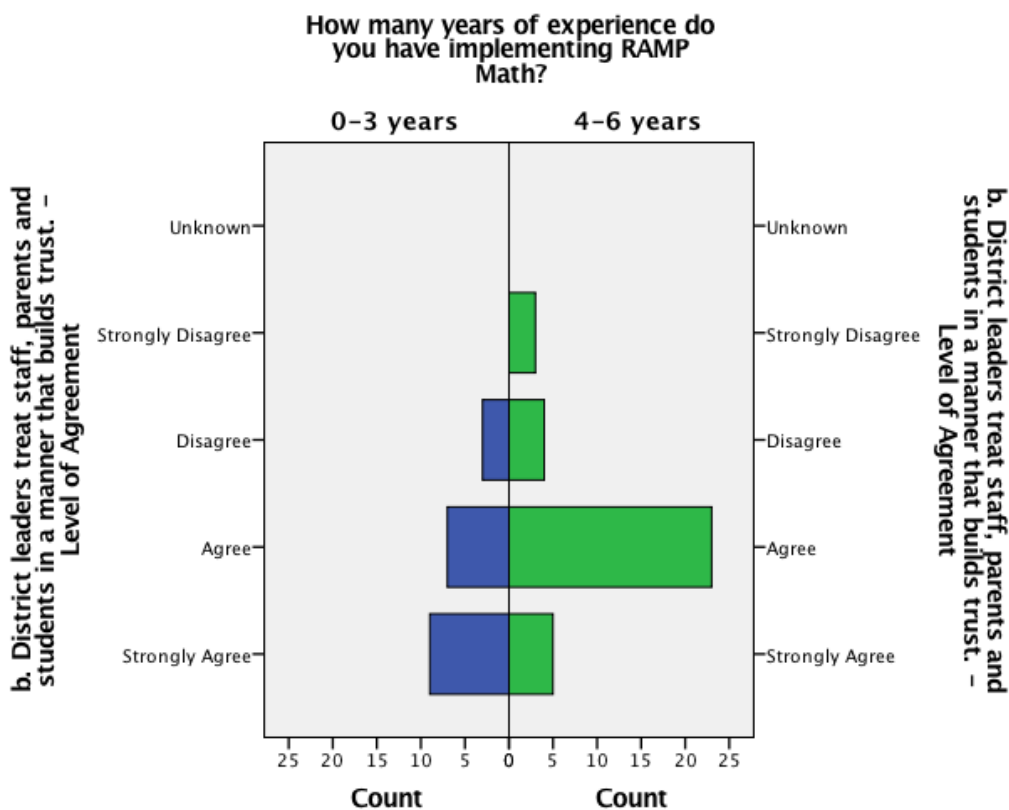*Figure 17*. Organizational Assessment Survey responses conveying the perceptions of teachers regarding Systems Thinking Item #31b- encouraging schools to structure staff time and resources.

Those with more implementation experience reported more disagreement and more perception of unknown with this statement than those with less implementation experience. While this item might be identified as an overall strength, analysis of the data indicated that this element might be a potential barrier for a proportion of teachers with more implementation experience. This supported the alternative hypothesis, which stated there is a statistically significant association between level of agreement for specific items on the Organizational Assessment Survey and teachers with differing levels of implementation experience.

18. **Statistically Significant Item #31e- Systems Thinking: Leadership Teams Take Responsibility for Solving Problems: (Overall System Strength):** There was a moderate correlation between number of years of implementation experience and perceived level of agreement with the statement that *district and school leadership teams take responsibility for solving problems and avoiding blame as a solution* amongst 54 participants, which was statistically significant ($\tau_{b} = 0.352$, $p < .01$). Figure 18 shows the data for item #31e.
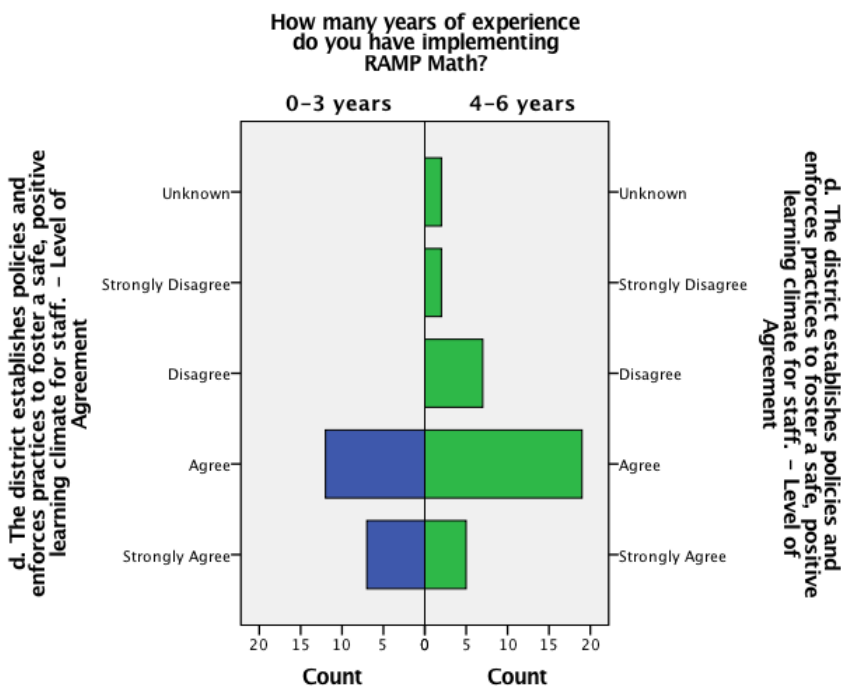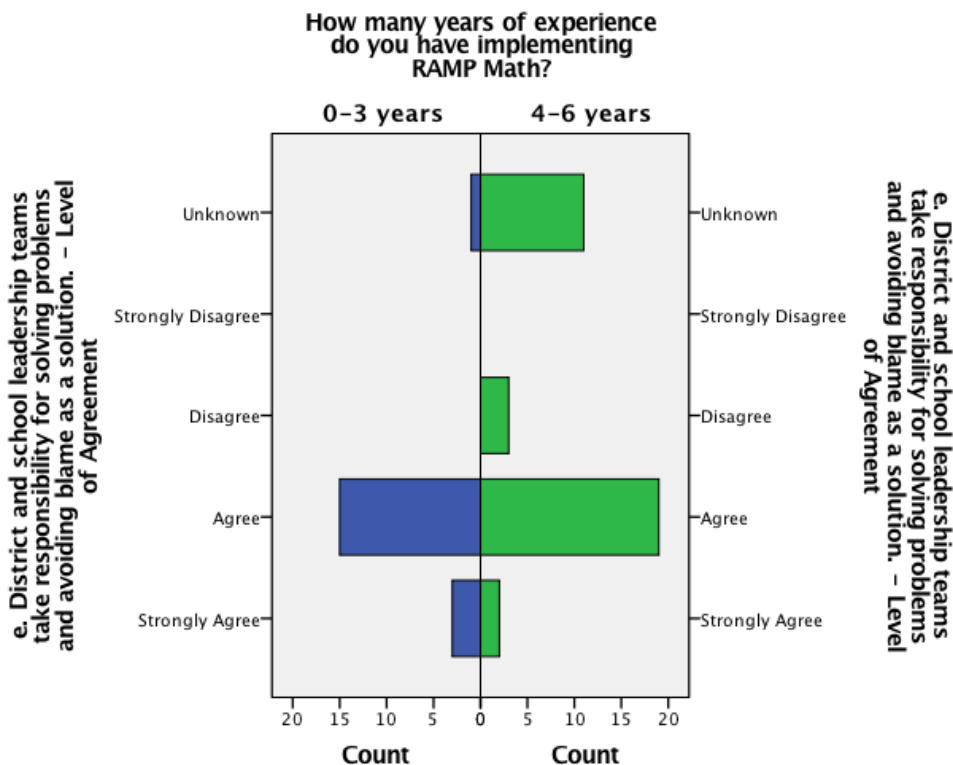
Figure 18. Organizational Assessment Survey responses conveying the perceptions of teachers regarding Systems Thinking Item #31e- leadership teams take responsibility for problem solving and avoid blame.

A proportion of teachers with more implementation experience reported more disagreement and more perception of unknown with this statement than those with less implementation experience. While this item was identified as an overall strength, analysis of the data indicated that this element might be a potential barrier for a proportion of teachers with more implementation experience. This supported the alternative hypothesis, which stated there is a statistically significant association between level of agreement for specific items on the Organizational Assessment Survey and teachers with differing levels of implementation experience.

A Kendall's tau-b correlation was run to determine the association between amount of implementation experience and specific items on the Organization Assessment Survey. 58 items were found to be non-significant. Information about these items can be found in the appendix.

Summary of correlational data. All in all, the analysis of correlational data reveals statistically significant relationships between many of the items on the Organizational Assessment Survey and amount of teacher implementation experience. Although this supported the researcher's alternative hypothesis, it did so differently than anticipated. Prior to surveying teachers, it was believed teachers with less reform experience would indicate more perceived barriers to reform implementation and sustainability. According to this correlational analysis, a proportion of teachers with more exposure to the reform may be experiencing more barriers than those with less exposure. Specifically, a proportion of teachers with more implementation experience are less satisfied with their administration, their school, resources provided, and support from parents. In similar fashion, a proportion of teachers with four years of implementation experience or more reported they believe more strongly that parents and community members have less influence in decision-making. They also reported they believe the district's staff development is less effective. Additionally, they reported less agreement relative to the taking of personal responsibility, regular evaluation of teachers, climate, accountability, building of trust, fostering of a learning environment, and support for structures which aid in brainstorming and creative problem solving.

It is important to note that the researcher cannot make a generalization between the perceptions of a proportion of teachers with four or more years of implementation

experience and all teachers with this same level of experience. It is clear some teachers within this category felt more dissatisfied, or disagreed more, with certain items on the OAS and other teachers in the same category did not report this same level of dissatisfaction/disagreement. It is also important to note that the researcher cannot assume that the proportion of teachers expressing some dissatisfaction/disagreement with one item are the same teachers expressing dissatisfaction/disagreement with all of the items in this analysis.

It is also worth noting that even though teachers with more implementation experience reported more negatively about some of the items on the Organizational Assessment Survey, teachers with this same level of implementation experience reported more positively on items specific to the perceived impact of the program on learning. Specifically, a higher proportion of teachers with more implementation experience reported they believe the RAMP math program is positively impacting their teaching and believe that district goals for RAMP math have a stronger influence on their instruction.

Finally, a correlational analysis of the variables from the OAS indicated that the correlation between level of teacher experience and 58 items on the Organizational Assessment Survey were found to be not statistically significant.

Summary

This chapter provided a description and analysis of the quantitative data collected during the study. First, demographic data was reported. Second, a quantitative statistical analysis was used to identify overall strengths and potential barriers associated with a mid-sized school district's mathematics reform. Last, a correlational analysis was used to identify statistically significant associations between teachers with differing levels of

reform implementation experience and specific elements identified as important to successful reform and long-term sustainability. Weak to moderate statistically significant relationships were detected between 18 out of 76 total items on the OAS. For many of these items, a higher proportion of teachers with four or more years of implementation experience were more dissatisfied with specific reform elements. In many cases, the elements identified as statistically significant were aligned with items previously identified as overall strengths. This may indicate that while these elements might be perceived as strengths for some teachers, they could also be identified as potential barriers for a proportion of teachers with four or more years of implementation experience. In addition, a higher proportion of teachers with four or more years of implementation experience reported that the reform has positively impacted student learning and that the reform has had a stronger influence on their instruction. While this is a potential strength for many teachers, especially those with four or more years of implementation experience, it might be a potential barrier for teachers with less implementation experience. Chapter Five focuses on the discussion of these findings and on their relevance specific to this particular reform. The chapter also focuses on potential areas of future research and on the significance of the results to the research community and to practitioners in the field of education.

Chapter Five

Discussion of Results

Reform is a reality for many schools and districts. The stimulus for reform can stem from various things, including changing priorities from within the organization and/or from requirements to schools and districts, which arise from outside the organization (Leithwood et al., 1998). Additionally, schools and districts are complex institutions (Senge, 2006). There are frequently many elements involved in systemic reform efforts. According to Senge (2006) and Thornton et al. (2007), many reform efforts fail because of a lack of focus on the interconnected elements involved in the reform. A systems thinking approach can help districts and schools to focus on the interrelationships that exist between key reform variables (Dibella & Nevis, 1998; Senge, 2006; Thornton et al., 2007). Two theories were used in this study, which aid in a systems thinking approach. The first theory was Organizational Learning Theory as articulated by Leithwood et al. (2006). This theory is centered on elements determined to be essential for successful reform. The second was Sustainability Theory as articulated by Coburn (2003), which was used to identify elements that aid in the sustainability of reform over time. According to Alsbury (2012), a monitoring tool that contains the elements necessary for successful and sustainable reform can be a useful tool for identifying the presence, and/or absence, of strengths and barriers to reform efforts. A monitoring tool consisting of these elements was used in this study to investigate the current level of reform implementation in the study district.

A quantitative analysis was utilized to assess reform implementation and sustainability for one district's mathematics reform. Two variables were named in this

study. The first variable was associated with elements determined to be essential for successful and sustainable reform. These elements were grounded in Organizational Learning Theory (Leithwood et al., 2006) and Sustainability Theory (Coburn, 2003). The second variable was associated with reform implementation experience. Alsbury's (2012) Organizational Assessment Survey (OAS) was used as the monitoring tool for this study. The survey was administered to 57 K-4 teachers in the study district. Study participants were asked about their perception in relation to 76 reform elements. The study focused on two elements. The first focus was on the identification of strengths and barriers to current reform. Strengths to reform were identified based on high proportions of agreement on survey items. Specifically, an item (reform element) was identified as a strength to reform if the proportion of agreement, or overall level of positive response, was equal to 70% or above. In similar fashion, barriers to future sustainability were identified. Items (reform elements) were identified as potential barriers based on higher proportions of disagreement, or negative responses. The researcher also analyzed responses that were either unknown or neutral to determine whether these elements were strengths or potential barriers. This first purpose was aligned to the first research question, which asked: What are the frequencies of responses as they relate to level of agreement, disagreement, or unknown for each item relative to effective reform implementation and potential sustainability as measured by the Organizational Assessment Survey?

The second purpose for this study was to examine the association between reform elements (items on the OAS) and amount of implementation experience for teachers involved with the district's mathematics reform. The researcher examined potential differences between two groups of teachers (those with four or more years of

implementation experience and those with three years of implementation experience or less). Specifically, the researcher was seeking to answer a second research question, which asked: Does a statistically significant difference exist for specific items relative to level of agreement, disagreement, or unknown for elements on the Organizational Assessment Survey between teachers who have differing levels of experience implementing the district's large-scale mathematics reform? The researcher was seeking to learn more about potential differences, because it was suspected that differences in perception might exist due to variances in implementation throughout the reform period. It was also predicted that differences might be associated with additional barriers for teachers with less reform implementation experience.

All K-4 math teachers in the study district were invited to participate in the study. Of the district's 84 K-4 math teachers, 69% chose to take the survey (57 total math teachers). There were two goals for this study. The first goal was to assess the current status of reform implementation and to identify strengths and barriers to reform. The hope was that identification of current strengths and potential barriers might provide useful information for future implementation of the district's mathematics program. The second goal was to add to the current research base on organizational learning and sustainability and to provide useful information to practitioners who are seeking to learn more about the use of a monitoring tool to assess reform implementation in district- and school-based settings.

Overview and Discussion of Findings

This section provides a discussion of the study results in relation to both research questions.

Research Question 1: Identification of strengths and barriers. A synthesis of three independent studies on the conditions that foster organizational learning in schools provides information about key elements, which aid in successful reform (Leithwood & Aitken, 1995; Leonard, 1996; Sharratt, 1996). According to these researchers, organizational learning consists of three overarching categories: stimulus for learning, organizational learning processes, and organizational learning outcomes. Within the category of organizational learning processes are the following variables: (a) out-of-school variables such as the district, community, and ministry/state, (b) leadership, and (c) in-school variables such as vision, culture, structure, strategy, and policy/resources. Additionally, research by Coburn (2003) can be used to identify the variables, which aid in long-term sustainability including: depth, spread, and shift in ownership. Because Alsbury's (2012) Organizational Assessment Survey is directly aligned to these variables, it was used as a monitoring tool to identify the presence and/or absence of elements aligned with these theories. More specifically, quantitative analysis of survey results aided in the identification of strengths to current implementation of reform and potential barriers to future sustainability for the study district.

Although the stimulus for learning was not the focus for this research study, it is important to mention the stimulus for learning for this particular reform movement, because it appears to be influential to overall reform implementation. Analysis of MSP grant documents indicates that the stimulus for learning was associated with what the district referred to as a troubling problem in mathematics. Specifically, grant documents signify that the district was concerned that students were not successful when progressing beyond 4th grade into fraction concepts, pre-algebra, and higher mathematics courses

(MSP Grant, 2012). This concern led the district to apply for and successfully attain two Math and Science Partnership Grants (funded by federal Title II, Part B dollars). This stimulus was directly aligned to the organizational learning processes that were assessed in this study. Specifically, this stimulus was connected to well-articulated goals and objectives (Math: Getting It Project, 2009a), which outlined the organizational learning processes for this particular reform effort. These processes included elements such as professional development, the formulation of data-driven Professional Learning Communities, identification of teacher leaders, structured collaboration among various stakeholder groups, creation and maintenance of resources, a process for accountability, and dedicated time for data review (Math: Getting It Project, 2009a). It is important to note that all teachers were required to use the district's mathematics program when the first grant was obtained. Additionally, the program continues to be required for all K-4 mathematics teachers within the study district. Requirement of program usage is directly associated with many of the reform elements, such as: accountability, use of data for continuous improvement, PLC support structures, alignment of policies and procedures, professional development, allocation of resources, etc.

A statistical analysis of the descriptive data was used to identify strengths to current implementation. Analysis of teacher perception revealed several strengths. First, the data indicates a high proportion of teachers are satisfied with the district, their school, their grade level, and their current teaching position. Teachers in this district perceive that diversity is valued and that the culture is positive in nature. Additionally, a high proportion of teachers believe school and district staff are supportive of this particular reform effort. In general, the data indicates that the overall school and district climate is

positive. Based on the data collected in this study, one cannot be certain as to why teachers feel satisfied with these elements. The high level of satisfaction within the district is worth noting. This particular reform has been a substantial undertaking. Teachers were required to learn about and implement a mathematics program which was substantially different from programs used in the past. Evidence to show that teachers are satisfied, even in the face of such learning, is encouraging.

A second strength is associated with learning outcomes. The data reveals that a high proportion of teachers perceive this reform to be associated with a positive influence on their instruction. Teachers perceive that the mathematics reform is associated with a positive change to their teaching and to student learning. The data also indicates that a high proportion of teachers believe there are structures in place which support brainstorming and facilitate learning. In short, it appears that many teachers associate the mathematics reform with positive outcomes to learning.

A third strength is associated with teacher perception as it relates to accountability. A high proportion of teachers reported that the district maintains high expectations for student achievement. Teachers reported that administrators and faculty take personal responsibility for student performance and that there are processes in place for monitoring progress as it relates to goals and student achievement. Additionally, a high proportion of teachers perceive that the district shares student achievement data with all teachers. Accountability for this particular reform effort appears to be an overall strength.

A fourth strength is associated with the use of data for continuous improvement. A high proportion of teachers reported positively that the district requires programs to

have measurable goals. Teachers reported that the district often compares student achievement data with the data from other districts in order to measure success. Additionally, a high proportion of teachers reported that the district encourages the use of data to identify needs and addresses priority needs based on this data analysis. Teachers reported positively that there is a shared sense of responsibility for the success of students across the system.

A fifth strength is associated with effective leadership. A high proportion of teachers agree that the district provides a structure, support, and guidance to aid in meaningful collaboration aimed at student learning. In addition, teachers reported positively that district- level activities and decisions are aligned to the vision and goals. Finally, teachers reported that district leaders are knowledgeable about school improvement issues and initiatives. The data indicates that many of the variables associated with effective leadership are in place for this particular reform effort.

A statistical analysis of the descriptive data was used to identify potential barriers to long-term sustainability for the study district's mathematics reform. The first barrier identified relates to general level of satisfaction for specific resources. Although many teachers reported feeling satisfied with the district, their school, their grade level, and their position, a moderate proportion of teachers reported feeling only somewhat satisfied (21.1%) or dissatisfied (14.1%) with their administration. Teachers also reported feeling only somewhat satisfied (37.4%) or dissatisfied (9.1%) with the support provided from parents. Additionally, a somewhat larger proportion of teachers reported feeling only somewhat satisfied (21.1%) or dissatisfied (38.6%) with the resources provided for this particular reform. Finally, approximately 50% of teachers reported feeling only

somewhat satisfied with the staff development in the district and the staff development specific to the RAMP math program. It is worth noting that the level of dissatisfaction in this category was very low for overall district-level staff development (1.8% negative) and low for the RAMP math program (8.8% negative). However, the level of somewhat satisfied teachers could be an indication that staff development needs should be analyzed and addressed. All in all, the data indicates that there is less satisfaction with key supports in relation to this reform. Less satisfaction for certain resources could be a barrier to long-term sustainability.

The second barrier identified was the proportion of teachers reporting either neutral responses (17.5%) or negative responses (14.3%) when asked what type of change the program has had on them as individuals. Although 67.9% of teachers reported that the reform has had a positive change on them as individuals, just over 30% of teachers reported feeling a less than positive reaction to this statement. If teachers do not feel that the mathematics program impacts them in a positive way, they may be more likely to look for outside resources. This could be a threat to long-term sustainability.

A third barrier identified was related to participation of key stakeholders in the district's mathematics reform. Sixty-six percent of teachers reported the perception that the superintendent and principals have a relatively high level of influence on the mathematics reform. Conversely, over 60% of teachers reported the perception that they believe they have minimal/no influence on the mathematics reform. Approximately 70% reported that students have minimal/no influence on the mathematics reform and 49.1% of teachers reported that parents have minimal/no influence on the mathematics reform. Along the same lines, 43.9% of teachers reported that they did not know whether

stakeholders were represented proportionally on decision-making teams and 28.1% of teachers reported negatively to this statement. About 51% of teachers reported that the district was only somewhat effective at communicating plans for the future with stakeholders and 45.6% of teachers reported neutrally when asked whether stakeholders supported the decision-making process. At the very least, this data indicates teachers may not know how stakeholders are involved in the reform. Stakeholders have the potential to provide support to reform efforts in various ways. For example, teachers can provide expertise and field-based experience. They can provide specific information to those implementing the program. They can articulate what is working and what is not. It may be important to the long-term success of this reform that the district continue to involve more teachers in decision-making, so that program components can be strengthened over time. In addition, parents/guardians can provide supplementary support to students when they are not at school. They can support their children with homework completion and by providing additional practice. Involving these stakeholders in the reform may be important, because this involvement has the potential to help parents/guardians to know how best to provide this support. Clarifying how and why key stakeholders are involved in this particular reform might help to address potential barriers related to the involvement of these stakeholders.

A fourth barrier identified was associated with shared decision-making. A key component of shared decision-making is based on clarity of the vision (Leithwood et al., 1998). Although 62.5% of teachers reported positively that the district has developed a vision for what success with RAMP math looks like, 32.1% of teachers reported that this vision is unknown. Additionally, 61.4% of teachers reported that the vision is only

somewhat clear. It appears that although a vision exists, teachers are unclear about what the vision entails. One might ask, does the vision always remain the same or does it shift with the needs of the reform? When the mathematics reform was first implemented, sharing of the vision was part of the training all teachers received at the outset of the reform. Is it possible that the vision has shifted as the reform has evolved? It might be important that the district work to redefine the vision based on changing priorities. Addressing the vision, as it exists now, might be an important next step in addressing this potential barrier to long-term sustainability.

Collaboration is also a key component of shared decision making. Data analysis on items specific to collaboration reveal consistently negative responses for many of the items specific to this element. A moderate proportion of teachers (44.7%) reported negatively when asked whether the vision and goals were collaboratively developed. Approximately 39% of teachers reported negatively when asked whether the district solicits and is responsive to feedback from stakeholder, and 37.5% of teachers reported negatively in regards to the statement that the district encourages open discussion of problems and issues among staff. Additionally, 39.3% of teachers reported that the district encourages collaborative problem solving and inquiry into the effectiveness of its operations. Approximately 42% of teachers reported negatively in regards to the statement that the district engages faculty and staff in decision making, and 48.2% of teachers reported negatively that the district promotes change through dialogue and collaboration. Finally, 46.3% of teachers reported negatively that the district solicits feedback from stakeholders regarding real and perceived barriers. This confluence of data indicates that shared decision making could be a barrier to long-term sustainability for a

proportion of the district's math teachers. One might argue that shared decision-making

happens with this particular reform, but it does so through a teacher-leadership model.

The district has several structures in place by which shared decision-making occurs. For

example, the district works with PLC (Professional Learning Community) leaders. Each

school has one PLC leader for each grade level. These leaders work directly with district

and school administrators on issues related to this particular reform. Specifically, they

work with teacher leaders to clarify practices and strategies associated with the

mathematics program. They also work to write lesson plans and develop materials and

resources. Additionally, they work to clarify curriculum maps and pacing guides. PLC

leaders are tasked with sharing this process with their team members. It could be that this

method of communication leaves a proportion of teachers feeling disconnected. If this is

the case, the district might address barriers associated with shared decision-making, by

(a) involving more teachers in processes such as these, and/or by (b) improving the lines

of communication between PLC leaders and their teams. Worth noting, is the proportion

of positive responses to specific items centered on shared decision making. Specifically,

50% of teachers agreed that the district collaboratively develops a vision. Approximately

59% reported that the district encourages open discussion of problems and issues among

staff, 53.6% agreed that the district encourages collaborative problem solving and inquiry

into the effectiveness of its operations. About 49% agreed that the district engages faculty

and staff in decision-making, 44.4% agreed that the district promotes change through

dialogue and collaboration. Finally, 53.7% of teachers agreed that the district engages

concerned parties in meaningful dialogue to address issues. This data indicates a

moderate proportion of teachers agree that shared decision making is happening.

Learning more about why some teachers perceive shared decision-making to be occurring

and why others do not might be essential to long term sustainability.

A fifth barrier is associated with potential system-wide disconnects as identified

through neutral and unknown responses. As mentioned earlier, many teachers appear to

be unclear about the district's vision for RAMP math. They also seem to be unclear about

how key stakeholders are involved in reform efforts. These two elements may be

associated with system-wide disconnects. Another potential disconnect was associated

with assessment of strengths and weaknesses to reform efforts. When asked about how

often staff assess strengths and weaknesses of the RAMP math program, 19.1% reported

this usually happens, 45.6% of teachers reported it sometimes happens, and 35.1%

reported it rarely or never happens. The spread across response categories for this

particular item could be an indication that teachers do not really know how or when this

happens. A lack of understanding about how strengths and weaknesses are addressed

could indicate a system-wide disconnect. Additional system-wide disconnects were

revealed in the systems thinking category. Specifically, a moderate proportion of teachers

(38.9%) reported it was unknown whether district leaders make decisions that shift

problems from one part of the system to another. Approximately 43% of teachers

reported it was unknown whether the district analyzes issues for their impact on other

parts of the system. Within the innovation and creativity category, 38.9% of respondents

reported it was unknown whether district plans were flexible enough to allow leaders to

move in unforeseen directions. Thirty-seven percent of teachers reported it was unknown

whether district communication patterns keep stakeholders informed in advance of issues.

Finally, 33.3% of respondents reported it was unknown whether district leaders, polices,

and processes encourage faculty to try new ideas without fear of repercussions. All in all, it appears that a moderate proportion of teachers are unclear about how the district responds to different parts of the system. A lack of clarity around such items could be a potential barrier to long-term sustainability. That being said, it may worth asking the question: How much knowledge do teachers need about systems-level variables? Do unknowns about elements such as these lead to future barriers? This could be an area of future research.

As it relates to this particular study, the researcher was able to use the data taken from the Organizational Assessment Survey to successfully identify both strengths to current reform and potential barriers to future sustainability. A possible next step for the study district might be to analyze these strengths and barriers and to make data-driven decisions based on the survey results. Recognizing when strengths are present and reflecting on why helps to honor the hard work of those implementing the reform. Additionally, working collaboratively to understand why teachers perceive these strengths to be present might be a useful next step in identifying processes that aid in continuing to strengthen the positive reform elements. A second next step might be to learn more about the barriers identified. Because barriers could hamper future implementation and long-term sustainability, learning about why they may be present is essential.

Research Question 2: Association between reform elements and amount of implementation experience. The statistical analysis conducted to determine if a relationship exists between specific reform elements (items on the OAS) and amount of teacher implementation experience was statistically significant for 18 of the 76 reform

elements. A weak association was found between number of years of experience and impact of RAMP math on teaching, indicating that teachers with four or more years of experience felt more strongly that the program was positively impacting their teaching. Additionally, a moderate association was found between number of years of experience and influence on instruction, indicating that a higher proportion of teachers with four or more years of implementation experience perceived more positively that the RAMP math program has had a strong influence on their instruction. Both of these items indicate that a higher proportion of teachers in the four or more year category feel more positively that the program has impacted teaching and instruction. The researcher cannot make causal statements as to why this might be the case. It could be that teachers with four or more years of implementation experience have had more exposure with the program. Perhaps they have had more time to observe the program and to see impacts on students. Whatever the reason, teachers with more implementation experience reported more positively about the program's impacts than teachers with less implementation experience.

Statistical analysis revealed a higher proportion of teachers in the four or more year category had less satisfaction and/or more dissatisfaction with many of the reform elements. For example,

1. There was a weak association between number of years of implementation experience and level of satisfaction with one's school, indicating that teachers with four or more years of implementation experience reported slightly more dissatisfaction with this element than teachers with less implementation experience.

2. There was a weak association between number of years of experience and satisfaction with support provided from parents. A small proportion of teachers in the four or more year category were more dissatisfied or only somewhat satisfied with this support as compared with teachers in the three year or less category.

3. There was a weak association between number of years of implementation experience and resources provided. As stated in Chapter Four, this was an overall barrier for the district. That being said, teachers with more implementation experience reported more frequently that they were dissatisfied with these resources than teachers with less implementation experience.

4. There was a moderate association between number of years of experience and satisfaction with one's administration. A higher proportion of teachers with more implementation experience reported that they were only somewhat satisfied or dissatisfied with their administration as compared to teachers with less implementation experience.

5. There was a moderate association between number of years of experience and satisfaction with the district, indicating that a proportion of teachers with more implementation experience were dissatisfied on some level with the district. This data indicates that a proportion of teachers with more implementation experience are less satisfied with many of the elements in the overall satisfaction category. One cannot know why a proportion of teachers with more implementation experience are less satisfied or dissatisfied, but worth

noting is the consistency between amount of implementation experience and level of satisfaction for multiple items within this category.

Statistical analysis also revealed that a proportion of teachers with more implementation experience disagree, on some level, more often than teachers with less implementation experience as it relates to many of the reform elements. This was revealed for a couple of items in the accountability category. Specifically, there was a moderate association between number of years of experience and the taking of personal responsibility for student performance. While 100% of respondents in the three year or less category reported that they agree that personal responsibility is taken for student performance, a small proportion of teachers with more implementation experience either disagreed on some level with this statement or reported neutrally. There was also a moderate association between number of years of experience and level of agreement with the OAS item about teacher/principal evaluation for the purpose of monitoring progress on goals and student achievement. Again, 100% of teachers with less reform implementation experience reported some level of agreement with this item. Conversely, a proportion of teachers with more implementation experience reported either less agreement or reported that they disagreed with this statement.

Statistical analysis revealed significant differences in the diversity and climate categories. Specifically,

1. There was a weak association between number of years of implementation experience and the statement that a climate of caring and respect permeates the district. 100% of teachers with less implementation experience reported some level of agreement with this statement. Conversely, a small proportion

of teachers with more implementation experience reported either some level of disagreement with this statement or reported neutrally.

2. There was a moderate association between number of years of experience and the statement that faculty treat colleagues, students and parents with dignity despite circumstances. As was the case above, 100% of teachers with less reform implementation experience reported some level of agreement with this statement. A proportion of teachers with more implementation experience reported that they disagreed on some level with this statement.

3. There was a moderate association between level of implementation experience and the statement that district leaders hold staff accountable for consistently high standards and expectations for all individuals and groups. Again, 100% of teachers with less reform implementation experience reported some level of agreement with this statement. A proportion of teachers with more implementation experience either reported less agreement or reported some level of disagreement with this statement.

As it relates to climate,

4. There was a weak association between implementation experience and the statement that district leaders treat staff, parents, and students in a manner that builds trust. A proportion of teachers with more implementation experience reported either more disagreement or strong disagreement with this statement.

5. There was a moderate association between number of years of experience and the statement that the district establishes policies and enforces practices to foster a safe, positive learning climate for staff. 100% of teachers with less

implementation experience agreed on some level with this statement. A proportion of teachers with more implementation experience reported that they either disagreed on some level with this statement or reported neutrally. This data indicates teachers with less implementation experience reported positively about diversity and climate and that a proportion of teachers with more implementation experience reported negatively about these items. It is important to note that this difference does not exist for all teachers. There appear to be many teachers with more reform experience who feel positively about diversity and climate. That being said, learning more about why these differences exist is likely important for future implementation.

Analysis of the data revealed statistically significant differences for four additional items. Two of these items fell within the systems category.

1. There was a moderate association between number of years of implementation experience and the statement that the district encourages schools to structure staff time and resources to support brainstorming and creative problem solving. A proportion of teachers with more implementation experience either reported they disagree with this statement or reported neutrally.

2. There was a moderate association between number of years of implementation experience and the statement that district and school leadership teams take responsibility for solving problems and avoiding blame as a solution. A very small proportion of teachers with more implementation experience disagreed with this statement. Additionally, a larger proportion of teachers with more implementation experience reported neutrally.

3. As it relates to learning organizations, there was a weak association between number of years of experience and the statement that the district fosters an environment of mutual cooperation, emotional support, and personal growth. A proportion of teachers with more implementation experience either reported that they disagreed with this statement or reported neutrally.

4. There was a weak association between number of years of implementation experience and the involvement of parents and community members on decision-making teams. Teachers with more implementation experience reported more frequently that they believed parents and community members have either no influence or slight influence on decision-making teams.

This analysis leads to the rejection of the null hypothesis which states, no statistically significant association exists between level of agreement, disagreement, and/or unknown for specific items on the Organizational Assessment Survey and teachers with differing levels of implementation experience specific to the district's large-scale mathematics reform.

Summary of Results and Suggestions for Future Research

The outcomes of this study support the assertion that a monitoring tool can be used to identify strengths to current reform and potential barriers to long-term sustainability. The outcomes also support the assertion of a statistically significant association between years of reform implementation experience and level of agreement for specific items on the Organizational Assessment Survey. While this data leads to the rejection of the null hypothesis, it does so differently than the researcher anticipated. It was predicted that differences might be associated with teachers with less implementation

experience. Rather, the data indicates that statistically significant differences are associated with a proportion of teachers who have more implementation experience. It was also predicted that differences might be associated with the potential for more barriers for teachers with less reform implementation experience. Instead, it appears there may be the potential for more barriers for a proportion of teachers with more implementation experience. This is not the finding the researcher expected. That being said, it is an important finding. Use of a monitoring tool (the Organizational Assessment Survey) aided in the identification of barriers associated with a specific group of teachers. A possible next step might be to learn more about why teachers within this category feel as they do. This would help the district to focus its efforts strategically, so that the district can better address potential barriers to sustainability.

Of significance is the finding that teachers with more implementation experience feel more positively about the impact of the reform on teaching. In similar fashion, a larger proportion of teachers with more implementation experience feel that the reform has been impactful on their instruction. Is experience and increased exposure with the program associated with increased perception of positive outcomes? This was not the focus of this study, but might be an interesting area of future analysis. Could it be that more exposure to the mathematics program increases depth of knowledge around practices and strategies specific to RAMP math? Learning more about why teachers feel the reform positively impacts learning and instruction might provide useful insight to those leading the reform and, in turn, might aid in strengthening the program for teachers with less implementation experience.

Also of significance, is the association between amount of implementation experience and the number of statistically significant negative responses for teachers with more implementation experience. As the data indicates, a proportion of teachers with more reform experience reported negatively about reform elements such as climate, diversity, accountability, resources provided, involvement of parents and community members, and other systems-level items. The consistency of negative responses for this particular group is worth noting. Learning more about why these differences exist is likely essential to continued reform. Could it be that a pocket of teachers with more implementation experience feels disconnected? Could this be related to the shared-leadership model in place as a result of this reform? The district spends a considerable amount of time with specific teacher leaders. There are many teachers who are heavily involved in curriculum work. There are also many teachers involved as leaders of Professional Learning Communities (PLCs). Could this data be associated with teachers who are not involved in leadership work such as this? This may be an area for future research. One could argue that involvement of teacher leaders is important. A shared leadership model, which involves teacher leaders, serves to involve teachers in the work of the district. Some would argue that useful information is gained from teacher leaders. Additionally, some would argue that involving teacher leaders in reform builds capacity and helps to shift ownership of the reform to those who are implementing. That being said, does this model increase division for those who are not directly involved? Although this was not the focus of this study, it might be an area of future research.

Also worth noting is the level of positive responses from teachers with less reform implementation experience. The district dedicates a considerable amount of resources

(professional development, PLC time, etc.) to teachers with less reform implementation experience. This data indicates that teachers with less implementation experience feel more positively about elements such as: climate, diversity, and general satisfaction. Learning more about why teachers with less implementation experience reported more positively about specific reform elements might also be important. Are the current structures helping to keep teachers with less implementation experience more connected? If so, what happens when these structures are removed? Again, this might be an area of future research.

Finally, another area of future research might involve the use of monitoring tools for assessing other reform efforts. As it relates to this particular study, the monitoring tool used was grounded in theory and research. As a result, the researcher was able to focus on specific variables that have been identified as essential to successful and sustainable reform. The research for this particular study builds on research completed by Alsbury (2008, 2012), Coburn (2003), and Leithwood et al. (1998, 2006). Additional use of the Organization Assessment Survey as a monitoring tool for other reform efforts might add to the existing research base. This survey could be used in summative fashion, as was the case for this study. The survey might also be used in formative fashion, as was the case for Alsbury's ILA study (2012). In summary, learning more about the presence or absence of specific variables to reform could add to the current knowledge base on organizational learning, sustainability, and/or the use of monitoring tools to support reform efforts.

Limitations. There were several limitations associated with this study. The first limitation was affiliated with the response rates for certain groups. As mentioned in

Chapter Four, teachers in School A and School D were overrepresented (29% and 31% respectively), as compared to School B (19%) and School C (19%). This might have biased results, especially if overall school cultures impact certain reform elements. Additionally, second grade teachers and fourth grade teachers were overrepresented (24.6% and 21.1% respectively) as compared to kindergarten (15.8%), first grade (19.3%), and third grade teachers (15.8%). Because the mathematics content and resources differ within grade levels, this is something with which to keep in mind. More importantly, teachers with more implementation experience (63.2%) were overrepresented as compared to teachers with less implementation experience (36.8%). It is worth noting, however, that these percentages are in line with the total population. The overrepresentation of teachers with more implementation experience was anticipated, in part, because the sample size for teachers with less implementation experience was smaller to begin with. The researcher anticipated a possible underrepresentation of teachers with less implementation experience and worked to encourage respondents in the 0-3 year category to complete the survey. That being said, the overrepresentation of teachers with more implementation experience might have biased the results.

A second limitation was the researcher's position within the district. As an employee of the district, the researcher has a relationship with many of the study participants. This relationship might have impacted an individual teacher's decision about whether to participate in the study. Additionally, the researcher's relationship with study participants might have impacted how study participants responded to survey items. Based on survey results, this does not appear to be the case. That being said, this was a potential source of bias.

A third limitation was associated with a perceived fear of recognition. It is possible that teachers might have responded differently based on a perception that their survey results could be connected to certain individuals. If teachers responded differently, this could be a source of bias. The researcher put measures in place to ensure that responses were anonymous. The survey was given electronically. Teachers completed the survey on their own and submitted it directly to the SurveyMonkey system. The SurveyMonkey system was set up for maximum anonymity. This was shared with respondents in order to reduce any fear of recognition. Additionally, the researcher was the only one to have access to responses and responses were kept confidential.

A fourth limitation was the potential of one respondent to influence another. The study district is relatively small. District-wide, teachers work within close proximity. There is the potential that teachers might have talked about the survey in an attempt to influence the results of other respondents. As mentioned earlier, teachers completed the survey on their own time. Survey questions were completely electronic in nature. The survey also contained a lot of questions and response choices. It would have been difficult for teachers to see and respond to the survey together and/or to talk about the survey and adjust responses as a result of this communication. That being said, this is something with which to be aware.

A fifth limitation was the inability to infer causality. As mentioned several times throughout this chapter, this study was intended to provide the researcher with teacher perception relating to elements on the Organizational Assessment Survey. The researcher cannot draw conclusions as to why teachers responded the way they did.

The final limitation was associated with the scope of this research. This study was focused on a particular math program, in one district. Generalizations cannot be drawn between this reform and reform implementation and sustainability in other districts.

Implications for district and school practice. Many districts and schools experience periods of reform. Furthermore, reform efforts frequently require the dedication of a considerable amount of time, energy, and resources. According to Alsbury (2012), many reform initiatives lack sustainable gains, because those implementing the reform fail to focus on the complex realities of reform efforts. A monitoring tool that defines the components necessary for successful and sustainable reform can serve as a support to districts as they implement change.

The results of this study are substantively significant in that the elements identified as strengths and barriers are directly aligned to the research on Organizational Learning Theory by Leithwood et al. (2006), Sustainability Theory by Coburn (2003), and the use of monitoring tools as a framework to assess reform implementation by Alsbury (2008, 2012). Specifically, results from this study showcase how a carefully structured monitoring tool can be used to assess current conditions of reform implementation. Results are also practically significant in that they provide a concrete example, which shows how this monitoring tool can be used to assess reform conditions in districts and schools. The Organizational Assessment Survey is comprehensive in that it contains elements determined to be essential for both successful implementation and long-term sustainability. Additionally, the survey is easy to administer and can be analyzed in a timely fashion, enabling districts to monitor reform and to make timely adjustments as necessary.

Conclusion

Organizational Learning Theory (Leithwood et al., 2006) and Sustainability Theory (Coburn, 2003) can be useful for helping schools and districts to focus on the elements necessary for successful and sustainable reform. Both theories help to define the interconnected elements at play when implementing reform in schools and districts. Additionally, a monitoring tool is structured to contain all of the elements necessary for successful and sustainable reform and helps to keep districts and schools focused on all of these elements. The findings from this study provide evidence that a monitoring tool such as this can be an effective framework for identifying strengths and barriers, which are directly aligned to these elements. Descriptive data were investigated to identify strengths to current implementation and potential barriers to future sustainability for one district's large-scale mathematics reform. Furthermore, a statistical analysis aided in the identification of items for which there was a statistically significant association between the item and reform implementation experience. Results provided evidence leading to the rejection of the null hypothesis for specific items on the Organizational Assessment Survey. The findings also provide evidence that a monitoring tool can be used in districts and schools to aid in the identification of key reform variables. These results may be useful to other districts and schools that are in the process of implementing reform. Continued research on organizational learning, sustainability, and the use of monitoring tools for assessment of reform efforts could help to provide districts and schools with tools that aid in the strengthening of reform implementation and potential long-term sustainability.

References

Alsbury, T. L. (2004, November). *Leadership, scaling and succession in school reform efforts in accountability age.* Paper presented at the annual convention of the University Council for Educational Administration, Kansas City, MO.

Alsbury, T. L. (2008). Promoting sustainable leadership within the reform system. In B. Hand (1st ed.), *Science inquiry, argument and language: A case for the science writing heuristic* (pp. 177-194). Rotterdam, The Netherlands: Sense.

Alsbury, T. L. (2012, April). *Innovation leaders academy: Districtwide strategic teaming and sustainability of innovation.* Paper presented at the American Educational Research Association Conference, Vancouver, B.C.

Anderson, N. R., & West, M. A. (1998). Measuring climate for work group innovation: Development and validation of the team climate inventory. *Journal of Organizational Behavior, 19*, 235-258. https://dx.doi.org/10.1002/(SICI)1099-1379(199805)19:3<235::AID-JOB837>3.0.CO;2-C

Austin, M. S., & Harkins, D. A. (2008). Assessing change: can organizational learning "work" for schools? *The Learning Organization, 15*(2), 105-125. http://d: 10.1108/09696470810852302

Banner, D. K., & Gagné, T. E. (1995). *Designing effective organizations: Traditional & transformational views.* Thousand Oaks, CA: Sage.

Coburn, C. E. (2003). Rethinking scale: Moving beyond numbers to deep and lasting change. *Educational Researcher, 32*(6), 3-12. https://dx.doi.org/10.3102/0013189X032006003

Collinson, V., Cook, T. F., & Conley, S. (2006). Organizational learning in schools and school systems: Improving learning, teaching, and leading. *Theory Into Practice, 45*(2), 107-116. https://dx.doi.org/10.1207/s15430421

Cousins, B. (1996). Understanding organizational learning for school leadership and educational reform. In K. Leithwood, J. Chapman, D. Carson, P. Hallinger, & A. Hart (Eds.), *International handbook of educational leadership and administration.* Dordrecht, the Netherlands: Kluwer Academic.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Los Angeles, CA: Sage.

DiBella, A. J., & Nevis, E. C. (1998). *How organizations learn: An integrated strategy for building learning capability*. San Francisco, CA: Jossey-Bass.

Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). Los Angeles, CA: Sage.

Fink, A. (2013). *How to conduct surveys: A step-by-step guide* (5th ed.). Los Angeles, CA: Sage.

Gall, M. D., Gall, J. P., & Borg, W. R. (2003). *Educational research: An introduction* (7th ed.). Boston, MA: Pearson.

Hart, P. M., Wearing, A. J., Conn, M., Carter, N. L., & Dingle, R. K. (2000). Development of the school organisational health questionnaire: A measure for assessing teacher morale and school organisational climate. *British Journal of Educational Psychology, 70*, 211-228. https://dx.doi.org/10.1348/000709900158065

Higgins, M., Ishimaru, A., Holcombe, R., & Fowler, A. (2011). Examining organizational learning in schools: The role of psychological safety, experimentation, and leadership that reinforces learning. *Journal of Educational Change, 13*, 67-94. https://dx.doi.org/10.1007/s10833-011-9167-9

Holmstrom, A. (2010). District finds the right equation to improve math instruction. *Journal of Staff Development, 31*(6), 58-62.

Kline, P., & Saunders, B. (1998). *Ten steps to a learning organization.* Arlington, VA: Great Ocean.

Laerd Statistics. (2017). *SPSS statistics: Kendall's tau-b*. Retrieved from https://statistics.laerd.com/premium/spss/ktb/kendalls-tau-b-in-spss.php

Leithwood, K., & Aitken, R. (1995). *Making schools smarter*. Thousand Oaks, CA: Corwin.

Leithwood, K., Aitken, R., & Jantzi, D. (2006). *Making schools smarter: Leading with evidence* (3rd ed.)*.* Thousand Oaks, CA: Corwin.

Leithwood, K., Jantzi, D., & Steinbach, R. (1995). An organizational learning perspective on school responses to central policy initiatives. *School Organization, 15*(3), 229-52.

Leithwood, K., Leonard, L., & Sharratt, L. (1998). Conditions that foster organizational learning in schools. *Educational Administration Quarterly, 34*(2), 243-76. https://dx.doi.org/10.1177/0013161X98034002005

Leonard, L. J. (1996)*. Organizational learning and the initiation of school councils.* Unpublished doctoral dissertation, University of Toronto.

Math: Getting It Project. (2009a). *Goals and objectives*. Retrieved from

     http://www.upsd.wednet.edu/cms/lib07/WA01000687/Centricity/Domain/57/Ove

     rview/Grant Goals.pdf

Math: Getting It Project. (2009b). *Philosophy.* Retrieved from

     http://www.upsd.wednet.edu/Page/191

Math: Getting It Project. (2009c). *Project action plan*. Retrieved from

     http://www.upsd.wednet.edu/cms/lib07/WA01000687/Centricity/Domain/57/Ove

     rview/Grant Plan.pdf

Mathematics and Science Partnership Grant. (2012). *Math: Getting it project- Title II,*

     Part B grant report.

Mathematics and Science Partnership Grant. (2015). *Common core math connections-*

     Title II, part b grant report.

Mintzberg, H. (1994). *The rise and fall of strategic planning*. New York, NY: The Free

     Press.

Office of the Superintendent of Public Instruction. (2016). *School Report Card*. Retrieved

     from http://reportcard.ospi.k12.wa.us/summary.aspx?schoolId=

     190&OrgType=3&reportLevel=District&year=2015-16&yrs=2015-16

Salant, P., & Dillman, D. A. (1994). *How to conduct your own survey: Leading*

     professionals give you proven techniques for getting reliable results. New York,

     NY: John Wiley & Sons.

Sarason, S. B. (2000). *The predictable failure of educational reform: Can we change*

     course before it's too late? San Francisco, CA: Jossey-Bass.

Senge, P. M. (2006). *The fifth discipline: The art & practice of the learning organization.* London, UK: Doubleday.

Sharratt, L. (1996). *The influence of electronically available information on the stimulation of knowledge use and organizational learning in schools.* Unpublished doctoral dissertation, University of Toronto.

Thornton, B., Shepperson, T., & Canavero, S. (2007). A systems approach to school improvement: Program evaluation and organizational learning. *Education, 128*(1), 48-55.

U.S. Department of Education. (1983). *A Nation at Risk.* Retrieved from https://www2.ed.gov/pubs/NatAtRisk/risk.html

U.S. Department of Education. (2001). *No Child Left Behind Act of 2001*. Retrieved from http://www2.ed.gov/policy/elsec/leg/esea02/107-110.pdf

U.S. Department of Education. (2009). *Race to the Top Executive Summary*. Retrieved from http://www2.ed.gov/programs/racetothetop/executive-summary.pdf

U.S. Department of Education. (2016). *Every Student Succeeds Act*. Retrieved from http://www.ed.gov/essa

Appendix

Tables and Non-Significant Kendall's Tau-b Correlations

Table A1

Results for Multiple ANOVA Analyses- ILA OAS Survey Results (Alsbury, 2012)

Survey Selection	Mean	*SD*	Range	*F* Ratio	Significance	Other
Innovation Impact on the system	3.33	1.13	1-5	$(4,122) = 3.27$	$p < .014$	Largely Normally Distributed
Innovation Impact on Instruction	3.41	1.03	1.80-5	$(4,122) = 5.97$	$p < .0001$	Largely Normally Distributed
Vision and Planning	X	X	X	$(4,238) = 2.88$	$p < .02$	Strong Correlation Between Two Items ($r = .77$)
Effective Leadership	3.065	1.18	1-5	$(4,231) = 3.86$	$p < .005$	Strong Intercorrelation Between 4 Items in the Subscale (alpha of .84)
Accountability	3.18	1.29	1-5	$(4,231) = 3.27$	$p < .01$	Strong Intercorrelation Between 6 Items in the Subscale (alpha of .91)
Continuous Improvement	X	X	X	$(1,238) = 27.40$	$p < .0001$	Strong Correlation Between Two Items ($r = .86$) Eta Squared = .10
Systems Thinking	X	X	X	$(4,231) = 3.16$	$p < .01$	Strong Correlation Between Two Items ($r = .72$)
Innovation and Creativity	3.2	1.25	1-5	$(4,232) = 2.87$	$p < .02$	Strong Intercorrelation Between 5 Items in the Subscale (alpha of .93)

Table A2

Summary of Influences on Organizational Learning Processes (Leithwood et al., 1998)

Organizational Learning Variables	Organizational Learning Variables and Strength of Influence on OL Processes	
Stimulus for Learning- Influences OL Processes		
Organizational Learning Processes- • Influenced by the Stimulus for Learning • Influences Organizational Learning Outcomes	**Organizational Learning Variables-** Influence OL Processes	**Level of Influence on OL Processes**
	Out of School- District	2
	Out of School- Community	8
	Out of School- Ministry	6
	School Leadership	4
	In School- Vision	7
	In School- Culture	1
	In School- Structure	3*
	In School- Strategy	5
	In School- Policy/Resources	3*
OL Outcomes- Influenced by OL Processes		

Note: According to Leithwood et al. (1998), the level of influence given to organizational learning variables is aligned with the amount of influence a particular variable has on organizational learning processes. A level of one indicates the variable has the highest level of influence. A level of eight indicates the variable has the lowest level of influence.

*Tied in importance

Table A3

Variables for each of the studies on organizational learning (Alsbury, 2008, 2012; Austin & Harkins, 2008; Leithwood et al., 1998)

Alsbury (2008 & 2012)	Austin & Harkins (2008)	Leithwood et al. (1998)
1. Depth	1. Participative Safety	1. Stimuli for Learning
2. Spread	2. Task Orientation	2. OL Processes
3. Shift in Ownership	3. Organizational Performance	3. Out-of-School Variables
4. Mission, Goals, and Organizational Culture	4. Organizational Climate	4. In-School Variables
5. School Culture		5. School Leadership
6. School/District Leadership		6. OL Outcomes
7. Instructional Services		
8. Structure and Organization		
9. Policy and Procedures		
10. District Community Partnerships		

Table A4

Results for Kendall's Tau-b Analysis- RAMP Organizational Assessment Survey Results

Online Survey Question Number	Question Text	Correlations	Statistically Significant (Yes or No)	General Strength	Potential Barrier
8	Overall, how supportive are the school staff and faculty of the RAMP math program?	$\tau_b = 0.059$, $p = .641$	No	Strength	
9	Overall, how supportive are the district staff and faculty of the RAMP math program?	$\tau_b = 0.010$, $p = .939$	No	Strength	
10a	Note below what type of change the RAMP math program has or likely will have on you.	$\tau_b = - 0.194$, $p = .135$	No		Barrier
10b	Note below what type of change the RAMP math program has or likely will have on your teaching.	$*\tau_b = - 0.288$, $p < .05$	Yes	Strength	
10c	Note below what type of change the RAMP math program has or likely will have on your students' learning.	$\tau_b = - 0.230$, $p = .081$	No	Strength	
11a	Describe your general level of satisfaction with your administration.	$*\tau_b = 0.379$, $p < .01$	Yes		Barrier
11b	Describe your general level of satisfaction with your district.	$*\tau_b = 0.382$, $p < .01$	Yes	Strength	
11c	Describe your general level of satisfaction with your school.	$*\tau_b = 0.298$, $p < .05$	Yes	Strength	
11d	Describe your general level of satisfaction with your current grade/subject assignment.	$\tau_b = 0.215$, $p = .091$	No	Strength	
11e	Describe your general level of satisfaction with your resources provided.	$*\tau_b = 0.268$, $p < .05$	Yes		Barrier

Online Survey Question Number	Question Text	Correlations	Statistically Significant (Yes or No)	General Strength	Potential Barrier
11f	Describe your general level of satisfaction with your support from parents.	$*\tau_b = 0.261$, $p < 0.05$	Yes		Barrier
12	Does your district develop a vision for what success with RAMP math looks like?	$\tau_b = -0.075$, $p = .570$	No		Barrier
13	How clear is your district vision of RAMP math to you?	$\tau_b = -0.132$, $p = .294$	No		Barrier
14	How much influence do you believe the district goals for RAMP math have on your instruction?	$*\tau_b = -0.303$, $p < 0.05$	Yes	Strength	
15a	Indicate who is involved in decision-making in your district and the level of influence they are given- You	$\tau_b = 0.115$, $p = .354$	No	Cannot Discern	Cannot Discern
15b	Indicate who is involved in decision-making in your district and the level of influence they are given- Other Teachers	$\tau_b = -0.145$, $p = .254$	No	Cannot Discern	Cannot Discern
15c	Indicate who is involved in decision-making in your district and the level of influence they are given- Students	$\tau_b = -0.161$, $p = .195$	No	Cannot Discern	Cannot Discern
15d	Indicate who is involved in decision-making in your district and the level of influence they are given- Principals	$\tau_b = -0.081$, $p = .511$	No	Cannot Discern	Cannot Discern
15e	Indicate who is involved in decision-making in your district and the level of influence they are given- Superintendent	$\tau_b = -0.056$, $p = .654$	No	Cannot Discern	Cannot Discern

Online Survey Question Number	Question Text	Correlations	Statistically Significant (Yes or No)	General Strength	Potential Barrier
15f	Indicate who is involved in decision-making in your district and the level of influence they are given- School Board Members	$\tau_b = - 0.230$, $p = .059$	No	Cannot Discern	Cannot Discern
15g	Indicate who is involved in decision-making in your district and the level of influence they are given- Parents or Community Members	$*\tau_b = -0.254$, $p < .05$	Yes	Cannot Discern	Cannot Discern
16	Are most stakeholders represented proportionally on decision-making teams?	$\tau_b = 0.046$, $p = .716$	No		Barrier
17	Rate the effectiveness of your district in communicating goals and plans for the future with stakeholders.	$\tau_b = 0.063$, $p = .619$	No		Barrier
18	How well do most stakeholders support the decision making process?	$\tau_b = - 0.045$, $p = .723$	No		Barrier
19	In general, how effective is the staff development program in your district?	$*\tau_b = 0.277$, $p < 0.05$	Yes		Barrier
20	How effective is staff development in directly supporting the RAMP math program?	$\tau_b = - 0.024$, $p = .848$	No		Barrier
21	Concerning new innovations introduced in your district/school, there are…	$\tau_b = - 0.137$, $p = .283$	No	Cannot Discern	Cannot Discern
22	In general, how receptive/supportive are the faculty to innovations or new programs?	$\tau_b = 0.114$, $p = .367$	No		Barrier

Online Survey Question Number	Question Text	Correlations	Statistically Significant (Yes or No)	General Strength	Potential Barrier
23	How often do staff assess strengths and weaknesses of the RAMP math program that lead to necessary changes?	$\tau_b = 0.038$, $p = .759$	No		Barrier
24a	Vision and Planning: The district collaboratively develops a vision and goals with staff, parents, and students.	$\tau_b = 0.051$, $p = .682$	No		Barrier
24b	Vision and Planning: The district solicits and is responsive to feedback from stakeholders.	$\tau_b = -0.055$, $p = .656$	No		Barrier
24c	Vision and Planning: The district encourages open discussion of problems and issues among staff.	$\tau_b = -0.100$, $p = .424$	No		Barrier
24d	Vision and Planning: The district encourages collaborative problem solving and inquiry into the effectiveness of its operations (programs, policies, processes).	$\tau_b = -0.006$, $p = .964$	No		Barrier
25a	Effective Leadership: The district provides a structure (common time and place) to support teacher collaborations aimed at improving student learning.	$\tau_b = 0.191$, $p = .138$	No	Strength	
25b	Effective Leadership: The district provides guidance (processes, modeling, coaching, resource materials, expert advice, or supervision) to support meaningful teacher collaborations about student learning.	$\tau_b = 0.159$, $p = .212$	No	Strength	

Online Survey Question Number	Question Text	Correlations	Statistically Significant (Yes or No)	General Strength	Potential Barrier
25c	Effective Leadership: District activities, analyses, and decision-making are aligned to vision goals.	$\tau_b = -0.132$, $p = .295$	No	Strength	
25d	Effective Leadership: The district engages faculty and staff in decision-making.	$\tau_b = -0.148$, $p = .238$	No		Barrier
25e	Effective Leadership: The district promotes change through dialogue and collaboration.	$\tau_b = -0.038$, $p = .763$	No		Barrier
25f	Effective Leadership: District leaders are knowledgeable of school improvement issues and initiatives.	$\tau_b = 0.161$, $p = .202$	No	Strength	
26a	Accountability: Administrators and faculty in our district usually maintain high expectations for student academic achievement.	$\tau_b = 0.130$, $p = .335$	No	Strength	
26b	Accountability: Student success, not just test scores, is the top priority in this district.	$\tau_b = 0.114$, $p = .368$	No	Strength	
26c	Accountability: The district shares individual student achievement data (broken down by dub-group, school district, and state results) with all teachers.	$\tau_b = 0.210$, $p = .105$	No	Strength	
26d	Accountability: Administrators and faculty take personal responsibility for student performance; excuse-making and blaming failures on circumstances or people.	$*\tau_b = 0.321$, $p < .05$	Yes	Strength	

Online Survey Question Number	Question Text	Correlations	Statistically Significant (Yes or No)	General Strength	Potential Barrier
26e	Accountability: The district uses reward, consequences, and recognition systems to encourage high levels of staff and student achievement.	$\tau_b = 0.201,$ $p = .105$	No		Barrier
26f	Accountability: The Principal regularly conducts teacher evaluation to monitor progress on goals and student achievement.	$*\tau_b = 0.378,$ $p < .01$	Yes	Strength	
27a	Using Data for Continuous Improvement: The district requires periodic monitoring and reporting of program effectiveness data.	$\tau_b = -0.040,$ $p = .748$	No		Barrier
27b	Using Data for Continuous Improvement: The district requires programs to have measureable goals based on identified data sources.	$\tau_b = 0.009,$ $p = .946$	No	Strength	
27c	Using Data for Continuous Improvement: The district often compares our students' achievement results to other similar districts as a measure of our success.	$\tau_b = 0.042,$ $p = .748$	No	Strength	
27d	Using Data for Continuous Improvement: The district identifies and addresses priority needs based on data analysis.	$\tau_b = 0.008,$ $p = .950$	No	Strength	
27e	Using Data for Continuous Improvement: The district encourages the use of data to identify needs throughout the system.	$\tau_b = -0.058,$ $p = .663$	No	Strength	
28a	Valuing Diversity: Diversity is valued in our district.	$\tau_b = 0.183,$ $p = .160$	No	Strength	

Online Survey Question Number	Question Text	Correlations	Statistically Significant (Yes or No)	General Strength	Potential Barrier
28b	Valuing Diversity: The leadership and faculty are culturally representative of the community.	$\tau_b = 0.185$, $p = .163$	No		Barrier
28c	Valuing Diversity: A climate of caring and respect for individuals, despite social, cultural, religious, ethnic, physical, or other differences permeates operations in our district.	$*\tau_b = 0.262$, $p < .05$	Yes	Strength	
28d	Valuing Diversity: Faculty in this district treat colleagues, students and parents with dignity despite circumstances.	$*\tau_b = 0.361$, $p < .01$	Yes	Strength	
28e	Valuing Diversity: District leaders hold staff accountable for upholding consistently high standards and expectations for all individuals and groups.	$*\tau_b = 0.348$, $p < .05$	Yes	Strength	
29a	Climate: District leaders establish and maintain strong relationships with staff.	$\tau_b = 0.172$, $p = .177$	No	Strength	
29b	Climate: District leasers treat staff, parents and students in a manner that builds trust.	$*\tau_b = 0.273$, $p < .05$	Yes	Strength	
29c	Climate: The district regularly assesses the district/school climate.	$\tau_b = 0.032$, $p = .800$	No		Barrier
29d	Climate: The district establishes policies and enforces practices to foster a safe, positive learning climate for staff.	$*\tau_b = 0.369$, $p < .01$	Yes	Strength	
30a	Learning Organizations: The district nurtures leadership capabilities across the organization.	$\tau_b = 0.192$, $p = .132$	No	Strength	

Online Survey Question Number	Question Text	Correlations	Statistically Significant (Yes or No)	General Strength	Potential Barrier
30b	Learning Organizations: The district encourages problem-solving that involves risk-taking.	$\tau_b = 0.112$, $p = .377$	No		Barrier
30c	Learning Organizations: The district promotes change through dialogue and collaboration rather than through district directives.	$\tau_b = 0.082$, $p = .514$	No		Barrier
30d	Learning Organizations: The district offers effective and relevant professional development.	$\tau_b = 0.213$, $p = .106$	No	Strength	
30e	Learning Organizations: The district fosters an environment of mutual cooperation, emotional support and personal growth throughout the organization.	$*\tau_b = 0.298$, $p < .05$	Yes	Strength	
31a	Systems Thinking: District leaders make decisions that shift problems from one part of the systems to another.	$\tau_b = 0.194$, $p = .127$	No		Barrier
31b	Systems Thinking: The district encourages schools to structure staff time and available resources to support brainstorming and creative problem solving.	$*\tau_b = 0.332$, $p < .05$	Yes	Strength	
31c	Systems Thinking: District leaders engage concerned parties in meaningful dialogue to address issues, rather than settling on quick-fixes for individual problems.	$\tau_b = 0.221$, $p = .083$	No		Barrier
31d	Systems Thinking: The district analyzes issues for the impact on other parts of the system.	$\tau_b = 0.043$, $p = .742$	No		Barrier

Online Survey Question Number	Question Text	Correlations	Statistically Significant (Yes or No)	General Strength	Potential Barrier
31e	Systems Thinking: District and school leadership teams take responsibility for solving problems and avoiding blame as a solution.	$*\tau_b = 0.352$, $p < .01$	Yes	Strength	
31f	Systems Thinking: The district organizes opportunities for faculty to interact with educators outside of the district.	$\tau_b = -0.081$, $p = .517$	No		Barrier
32a	Innovation and Creativity: The district allows you to create time and opportunities for your own creative thinking.	$\tau_b = 0.027$, $p = .830$	No		Barrier
32b	Innovation and Creativity: The district solicits feedback from stakeholders concerning real and perceived barriers to creativity and innovation and then acts on this input to remove those barriers.	$\tau_b = -0.067$, $p = .595$	No		Barrier
32c	Innovation and Creativity: District leaders set meeting agendas that provide opportunities for meaningful discussion of important emergent issues.	$\tau_b = 0.170$, $p = .187$	No		Barrier
32d	Innovation and Creativity: District plans are flexible enough to allow leaders to move in unforeseen directions in response of unexpected events.	$\tau_b = 0.157$, $p = .221$	No		Barrier
32e	Innovation and Creativity: District communication patterns keep stakeholders informed in advance of issues and events allowing time to plan creative solutions.	$\tau_b = -0.052$, $p = .687$	No		Barrier

Online Survey Question Number	Question Text	Correlations	Statistically Significant (Yes or No)	General Strength	Potential Barrier
32f	Innovation and Creativity: District leaders, policies, and processes encourage faculty and administrators to try new ideas without fear of repercussions.	$\tau_b = 0.069$, $p = .587$	No		Barrier
32g	Innovation and Creativity: The district supports creative and innovative practices at all levels.	$\tau_b = 0.102$, $p = .424$	No		Barrier

* Denotes statically significant associations

Non-Significant Kendall's Tau-b Correlations

1. There was a weak association between amount of implementation experience and supportiveness of school staff and faculty of the RAMP math program, which was not statistically significant, $\tau_b = 0.059$, $p = .641$.

2. There was a weak association between amount of implementation experience and supportiveness of district staff and faculty of the RAMP math program, which was not statistically significant, $\tau_b = 0.010$, $p = .939$.

3. There was a weak association between amount of implementation experience and impact of the RAMP math program on you, which was not statistically significant, $\tau_b = -0.194$, $p = .135$.

4. There was a weak association between amount of implementation experience and impact of the RAMP math program on your students' learning, which was not statistically significant, $\tau_b = -0.230$, $p = .081$.

5. There was a weak association between amount of implementation experience and level of satisfaction with your current grade/subject assignment, which was not statistically significant, $\tau_b = 0.215$, $p = .091$.

6. There was a weak association between amount of implementation experience and district development of a vision for what success with RAMP math looks like, which was not statistically significant, $\tau_b = -0.075$, $p = .570$.

7. There was a weak association between amount of implementation experience and clarity of the district's vision for RAMP math to you, which was not statistically significant, $\tau_b = -0.132$, $p = .294$.

8. There was a weak association between amount of implementation experience and level of influence of you, which was not statistically significant, $\tau_b = 0.115$, $p = .354$.

9. There was a weak association between amount of implementation experience and level of influence of other teachers, which was not statistically significant, $\tau_b = -0.145$, $p = .254$.

10. There was a weak association between amount of implementation experience and level of influence of students, which was not statistically significant, $\tau_b = -0.161$, $p = .195$.

11. There was a weak association between amount of implementation experience and level of influence of principals, which was not statistically significant, $\tau_b = -0.081$, $p = .511$.

12. There was a weak association between amount of implementation experience and level of influence of the superintendent, which was not statistically significant, τ_b = - 0.056, p = .654.

13. There was a weak association between amount of implementation experience and level of influence of school board members, which was not statistically significant, τ_b = - 0.230, p = .059.

14. There was a weak association between amount of implementation experience and whether most stakeholders are represented proportionally on decision-making teams, which was not statistically significant, τ_b = 0.046, p = .716.

15. There was a weak association between amount of implementation experience and rating on the effectiveness of the district in communicating goals and plans for the future with stakeholders, which was not statistically significant, τ_b = 0.063, p = .619.

16. There was a weak association between amount of implementation experience and how well most stakeholders support the decision-making process, which was not statistically significant, τ_b = - 0.045, p = .723.

17. There was a weak association between amount of implementation experience and effectiveness of staff development in directly supporting the RAMP math program, which was not statistically significant, τ_b = - 0.024, p = .848.

18. There was a weak association between amount of implementation experience and the amount of new innovations introduced in the district, which was not statistically significant, τ_b = - 0.137, p = .283.

19. There was a weak association between amount of implementation experience and the level of receptiveness/supportiveness of the faculty to innovations or new programs, which was not statistically significant, $\tau_b = 0.114$, $p = .367$.

20. There was a weak association between amount of implementation experience and how often staff assess strengths and weakness of the RAMP math program that lead to necessary changes, which was not statistically significant, $\tau_b = 0.038$, $p = .759$.

21. There was a weak association between amount of implementation experience and collaborative development of a vision and goals with staff parents and students, which was not statistically significant, $\tau_b = 0.051$, $p = .682$.

22. There was a weak association between amount of implementation experience and whether the district solicits and is responsive to feedback from stakeholders, which was not statistically significant, $\tau_b = -0.055$, $p = .656$.

23. There was a weak association between amount of implementation experience and whether the district encourages open discussion of problems and issues among staff, which was not statistically significant, $\tau_b = -0.100$, $p = .424$.

24. There was a weak association between amount of implementation experience and whether the district encourages collaborative problem solving and inquiry into the effectiveness of its operations (programs, policies, processes), which was not statistically significant, $\tau_b = -0.006$, $p = .964$.

25. There was a weak association between amount of implementation experience and whether the district provides a structure (common time and place) to

support teacher collaborations aimed at improving student learning, which

was not statistically significant, $\tau_b = 0.191$, $p = .138$.

26. There was a weak association between amount of implementation experience

    and whether the district provides guidance (processes, modeling, coaching,

    resource materials, expert advice, or supervision) to support meaningful

    teacher collaboration about student learning, which was not statistically

    significant, $\tau_b = 0.159$, $p = .212$.

27. There was a weak association between amount of implementation experience

    and whether district activities, analyses, and decision-making are aligned to

    vision goals, which was not statistically significant, $\tau_b = - 0.132$, $p = .295$.

28. There was a weak association between amount of implementation experience

    and whether the district engages faculty and staff in decision making, which

    was not statistically significant, $\tau_b = - 0.148$, $p = .238$.

29. There was a weak association between amount of implementation experience

    and whether the district promotes change through dialogue and collaboration,

    which was not statistically significant, $\tau_b = - 0.038$, $p = .763$.

30. There was a weak association between amount of implementation experience

    and whether district leaders are knowledgeable of school improvement issues

    and initiatives, which was not statistically significant, $\tau_b = 0.161$, $p = .202$.

31. There was a weak association between amount of implementation experience

    and whether administration and faculty in the district usually maintain high

    expectations for student academic achievement, which was not statistically

    significant, $\tau_b = 0.130$, $p = .335$.

32. There was a weak association between amount of implementation experience and whether student success, not just test scores, is the top priority in the district, which was not statistically significant, $\tau_b = 0.114$, $p = .368$.

33. There was a weak association between amount of implementation experience and whether the district shares individual student achievement data (broken down by sub-group, school, district, and state results) with all teachers, which was not statistically significant, $\tau_b = 0.210$, $p = .105$.

34. There was a weak association between amount of implementation experience and whether the district uses reward, consequences, and recognition systems to encourage high levels of staff and student achievement, which was not statistically significant, $\tau_b = 0.201$, $p = .105$.

35. There was a weak association between amount of implementation experience and whether the district requires periodic monitoring and reporting of program effectiveness data, which was not statistically significant, $\tau_b = - 0.040$, $p = .748$.

36. There was a weak association between amount of implementation experience and whether the district requires programs to have measureable goals based on identified data sources, which was not statistically significant, $\tau_b = 0.009$, $p = .946$.

37. There was a weak association between amount of implementation experience and whether the district often compares student achievement results to other similar districts as a measure of success, which was not statistically significant, $\tau_b = 0.042$, $p = .748$.

38. There was a weak association between amount of implementation experience and whether the district identifies and addresses priority needs based on data analysis, which was not statistically significant, $\tau_b = 0.008$, $p = .950$.

39. There was a weak association between amount of implementation experience and whether the district encourages the use of data to identify needs throughout the system, which was not statistically significant, $\tau_b = - 0.058$, $p = .663$.

40. There was a weak association between amount of implementation experience and whether diversity is valued in the district, which was not statistically significant, $\tau_b = 0.183$, $p = .160$.

41. There was a weak association between amount of implementation experience and whether the leadership and faculty are culturally representative of the community, which was not statistically significant, $\tau_b = 0.185$, $p = .163$.

42. There was a weak association between amount of implementation experience and whether district leaders establish and maintain strong relationships with staff, which was not statistically significant, $\tau_b = 0.172$, $p = .177$.

43. There was a weak association between amount of implementation experience and whether the district regularly assesses the district/school climate, which was not statistically significant, $\tau_b = 0.032$, $p = .800$.

44. There was a weak association between amount of implementation experience and whether the district nurtures leadership capabilities across the organization, which was not statistically significant, $\tau_b = 0.192$, $p = .132$.

45. There was a weak association between amount of implementation experience and whether the district encourages problem-solving that involves risk-taking, which was not statistically significant, $\tau_b = 0.112$, $p = .377$.

46. There was a weak association between amount of implementation experience and whether the district promotes change through dialogue and collaboration rather than through district directives, which was not statistically significant, $\tau_b = 0.082$, $p = .514$.

47. There was a weak association between amount of implementation experience and whether the district offers effective and relevant professional development, which was not statistically significant, $\tau_b = 0.213$, $p = .106$.

48. There was a weak association between amount of implementation experience and whether district leaders make decisions that shift problems from one part of the system to another, which was not statistically significant, $\tau_b = 0.194$, $p = .127$.

49. There was a weak association between amount of implementation experience and whether district leaders engage concerned parties in meaningful dialogue to address issues, rather than settling on quick-fixes for individual problems, which was not statistically significant, $\tau_b = 0.221$, $p = .083$.

50. There was a weak association between amount of implementation experience and whether the district analyzes issues for their impact on other parts of the system, which was not statistically significant, $\tau_b = 0.043$, $p = .742$.

51. There was a weak association between amount of implementation experience and whether the district organizes opportunities for faculty to interact with

educators outside of the district, which was not statistically significant, $\tau_b = -0.081$, $p = .517$.

52. There was a weak association between amount of implementation experience and whether the district allows teachers to create time and opportunities for their own creative thinking, which was not statistically significant, $\tau_b = 0.027$, $p = .830$.

53. There was a weak association between amount of implementation experience and whether the district solicits feedback from stakeholders concerning real and perceived barriers to creativity and innovation and then acts on this input to remove those barriers, which was not statistically significant, $\tau_b = -0.067$, $p = .595$.

54. There was a weak association between amount of implementation experience and whether district leaders set meeting agendas that provide opportunities for meaningful discussion of important emergent issues, which was not statistically significant, $\tau_b = 0.170$, $p = .187$.

55. There was a weak association between amount of implementation experience and whether district plans are flexible enough to allow leaders to move in unforeseen directions in response to unexpected events, which was not statistically significant, $\tau_b = 0.157$, $p = .221$.

56. There was a weak association between amount of implementation experience and whether district communication patterns keep stakeholders informed in advance of issues and events allowing time to plan creative solutions, which was not statistically significant, $\tau_b = -0.052$, $p = .687$.

57. There was a weak association between amount of implementation experience and whether district leaders, policies, and processes encourage faculty and administrators to try new ideas without fear of repercussion, which was not statistically significant, $\tau_b = 0.069$, $p = .587$.

58. There was a weak association between amount of implementation experience and whether the district supports creative and innovative practices at all levels, which was not statistically significant, $\tau_b = 0.102$, $p = .424$.