


Summer August 31st, 2015

# Organizational Monitoring Systems and Student Academic Achievement

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**Organizational Monitoring Systems and Student Academic Achievement**

**Adam Swinyard**

**Seattle Pacific University**

Organizational Monitoring Systems and Student Academic Achievement

by

Adam Swinyard

A dissertation submitted in partial fulfillment

of the requirement of the degree of

Doctor of Education

Seattle Pacific University

2015

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## **Acknowledgement Page**

First and foremost, I give thanks and all honor to my Lord and Savior Jesus Christ, for the fruition of this journey rests on the provision of his blessings. To my wonderful and beautiful wife, Ashley, I owe immense gratitude for her endless support and sacrifice. Her unwavering love forged the bonds of perseverance and sustenance for our family. Thank you to my mother and father, Joe and Faye, who provided endless encouragement in the pursuit of my dreams. Their love, care, and guidance shaped the core of my foundation that made this accomplishment possible. I extend immense appreciation to my Grandfather Greg. Without his belief and expectations, I would not have had the determination needed to succeed and overcome the many challenges along the way. And last, to the Seattle Pacific University Faculty and fellow students, thank you for your invaluable partnerships in learning. This includes my deep appreciation to my committee chair, Dr. Alsbury, for his expertise, wise counsel, and encouragement, and to committee members: Dr. Bond and Dr. Prenevost for their invaluable feedback and perspectives on leadership theory and practice.

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Seattle Pacific University

Abstract

Organizational Monitoring Systems and Student Academic Achievement

By Adam Swinyard

Chairperson of the Dissertation Committee:

Dr. Thomas Alsbury

The current context of K-12 education emphasizes a strong focus on standardized test results to inform school improvement planning. Concerns about this phenomena center around the methodology used to determine actions intended to improve student achievement. Some educational experts suggest many schools rely solely on test results to develop school improvement plans (SIPs). Subsequently, solutions often address symptoms rather than foundational issues. As a result, schools fall into a cycle of selecting new initiatives that do not produce sustainable improvements. The concept of becoming a learning organization by using a monitoring system to inform systems thinking is presented as an alternative approach. Although empirical evidence exists that supports organizational learning (OL) in schools, studies on the prevalence, composition, and impact in American K-12 education is limited. This study is intended to assess the relevance of OL in the context of high stakes accountability experienced by American schools.

The findings provide evidence that organizational learning practices related to organizational monitoring is linked to student academic achievement. Multiple aspects of organizational monitoring were investigated to determine levels of statistical significance. Practices related to the collection and use of data based on school attributes were correlated with changes in the percentage of students proficient in reading and math.

Results provided evidence leading to the rejection of the null hypothesis aligned to each of the research questions. Secondary analysis indicated student demographics were not a substantial confounding variable and that the research survey demonstrated a reasonable level of validity. The study supports organizational learning theory suggesting systems thinking and organizational monitoring is linked to desired organizational outcomes. Findings provided efficacious evidence that organizational learning practices related to organizational monitoring are applicable in the context of American schools.

## **Chapter One**

### **Introduction**

The provision of a quality educational experience is a consistent theme throughout the history of American public schools. Proponents of the educational system often identify school outcomes as critical factors to economic and democratic success. Despite a shifting definition of quality, providing access to schools and fostering high levels of learning is a frequent topic of discussion and empirical research (Kyriakides & Campbell, 2004). This encompasses an ongoing conversation regarding the realities of school performance and the concept of improvement. Available evidence demonstrates wide-ranging school reform occurred throughout the 19<sup>th</sup> century. This indicates the pursuit of improvement is an enduring area of focus (Cuban, 1998). Recent years witnessed a drastic expansion of school reform, leading some experts to contend that reform initiatives are more prevalent now than ever before (Duchnowski, Kutash, & Oliveira, 2004). This period of time coincided with a range of new challenges related to increasing diversity, psychosocial barriers to learning (Adelman, 1996), and interest in developing school-linked solutions to broad problems facing communities (Sailor, 2002).

Stimulated by several significant historical educational reform initiatives, pressure to ensure students achieve high academic levels emerged as the central goal of the educational system. With the release of the report entitled *A Nation at Risk*, concern spread regarding the state of K-12 education (Guthrie, 2004; Richerme, 2012). This report contributed to the development of a policy agenda that eventually resulted in far-reaching federal legislation focused on improving academic achievement and eliminating the achievement gap. In 2001, passage and subsequent implementation of the No Child

Left Behind (NCLB) Act mandated the development of academic standards and established a framework for accountability and improvement (Dee & Jacob, 2011). Less than a decade later, the American Recovery and Reinvestment Act (ARRA) created the federal grant program Race to the Top, that encouraged states to adopt a set of national academic standards and new evaluation policies for teachers and principals (Finnigan & Daly, 2012). In the past few decades, the evaluation of individual school performance received a historic level of attention.

### **School Improvement Plans**

The relevance of enhancing the school improvement process stimulated the pursuit of alternative models (Dunaway, Kim, & Szad, 2012). As such, approaches to school improvement are garnering both theoretical discussion and empirical investigation (Fernandez, 2011). An increasing amount of attention is being allocated to the conditions necessary for the development of successful school improvement plans (SIPs) (Holmes & Maiers, 2012).

Since the passage of NCLB, most states now either require or strongly suggest schools establish a SIP (Dunaway et al., 2012). This typically involves the development of a SIP document that outlines assessment goals and specific actions (Fernandez, 2011). Plans usually include some form of evaluation on an annual basis, that informs actions implemented and success monitoring (Holmes & Maiers, 2012). In many cases, the SIP is created by a representative team of school staff members and aligned with school structures, resources, and professional development (Barnes, 2004). As a result, the plan is intended to form the basis for continuous school improvement, as well as acting as a

monitoring instrument to measure progress towards specific areas of whole-school development (Van Der Voort, 2014).

### **Test Scores to Measure School Success**

In the current context of the school improvement movement, accountability galvanized the influence of high stakes standardized tests (Shen & Cooley, 2008). Educational experts contend performance on standardized tests hold enormous implications for schools, and a reliance on improving test scores now shape how schools measure student improvement (Thornton, Peltier, & Perreault, 2004). Test results are used to shower praise or unleash condemnation on schools and in some cases, result in progressive sanctions, such as mandated reforms initiatives. The use of tests in this manner currently consumes the attention of educational stakeholders. Standardized tests are perceived to be invaluable and the focus on improving performance is widely recognized as the critical metric in school success (Murray, 2013). Schools are expected to analyze test data and engage in data-based decision making. Disaggregation of student populations and trend data are expected to illuminate the components of school effectiveness (Shen & Cooley, 2008). As a result, standardized tests are elevated as the most significant factor in school improvement planning (Coburn & Talbert, 2006). This practice created a singular focus on the output of the school process and the vigorous pursuit of initiatives that improve test scores (Wasler, 2009).

Implementation of high stakes standardized tests and proficiency mandates rapidly established the labeling of schools as “failing schools” (Dee & Jacob, 2011). The inability of schools throughout the country to meet test score benchmarks fueled public dismay with the educational system. Critics often proclaim a moral imperative exists to



close test score disparities between students of poverty and their more advantaged peers (O'Doherty & Ovando, 2009). To address this pressure as well as legislative directives, the concept of school improvement emerged as a prominent factor in public schools (Duchnowski et al., 2004). The idea of school improvement is not new, and in fact as early as 1978 schools have been advocating for funding to support school improvement processes (Edmonds, 2012). Despite the historical existence of improvement processes in some form or another for decades, the creation of a school improvement plan (SIP) more recently became an institutionalized component of the educational system (Dunaway et al., 2012).

### **School Improvement Plans Reliance on Test Scores**

The use of test results to guide school improvement touched off an explosion of school initiatives. SIPs are typically comprised of initiatives intended to raise standardized test results (Thornton et al., 2004). As a result, a culture of incessantly selecting new initiatives is now common practice across the country (Fullan, 2008). Initiatives are incorporated into SIPs only to be abandoned the next year when tests results do not increase. This introduced perpetual change as schools constantly seek the next popular idea. Stakeholders often lament that each year brings along a new set of initiatives to adopt (Van Der Voort, 2014). Not only does this inhibit the establishment of a consistent focus, but this approach to school improvement does not appear to positively impact student performance (Evans, Thornton, & Usinger, 2012). Inability to raise test scores is usually accompanied by feelings of frustration and a negative outlook on SIP processes (Minarik, Thornton, & Perreault, 2003). Individuals responsible for implementing SIPs often become more resistance to change over time. Although

compliance in implementing SIPs may represent a change in actions, underlining beliefs needed for fidelity commonly remain static (Spillane, 2000). This further exasperates the cycle of limited growth and pursuit of new initiatives (Evans et al., 2012).

### **School Improvement Plans and Organizational Learning**

SIPs are commonly based on feedback related to the current realities of the school. This information is analyzed in order to identify problem areas and specific actions for improvement. With the emergence of standardized tests and subsequent pressure to develop SIPs that improve results, many schools now focus solely on tests results. Feedback comprised entirely of tests results prompted concern SIPs do not utilize information that can effectively support the development of foundational solutions to student achievement. This concern contributed to ideas about the potential connection between schools and the concept of being a learning organization (Collinson, Cook, & Conley, 2006). Operating as a learning organization represents a vision for schools and organizational learning (OL) is a perspective on the processes for how to become a highly effective school system (Leithwood, Jantzi, & Steinbach, 1995). Proponents suggest organizational learning (OL) practices represent an alternative to relying on tests results to develop SIPs. The mechanisms of OL are described by some as the best method for addressing the complex nature of public schools. Engagement in OL is identified as a method for acquiring information essential to understanding the complex nature of school organizations. OL is conceptualized as a critical component to school improvement planning as staff members face a steady stream of novel problems and ambitious demands (Schechter & Qadach, 2012). Process information acquired through organizational learning practices offer the potential to identify solutions to foundational

issues rather than symptomatic problems. This information equips schools with high quality feedback to use in SIP development.

### **The Present Study**

The present study seeks to contribute to an understanding of how schools can effectively implement reforms that result in higher levels of academic achievement. The study proposes to determine if a significant relationship exists between improvements in reading and math proficiency rates on the Washington State's Measurement of Student Progress (MSP) in public middle schools and the school's use of an annual staff survey that collects process data related to the occurrence of school attributes. The study further proposes to determine if a significant relationship exists between improvements in reading and math proficiency rates on Washington State's Measurement of Student Progress (MSP) in public middle schools and the school's use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan. The study also purposes to determine if a significant relationship exists between improvements in reading and math proficiency rates on Washington State's Measurement of Student Progress (MSP) in public middle schools and the school's use of comprehensive organizational monitoring. The theory of Organizational Learning (Leithwood, Aitken, & Jantzi, 2006) serves as the foundational theoretical model for the study. A connection is established between the emerging pressure to improve schools and the prominent influence of standardized tests on school improvement plans. Conceptualization of the study is based on the theory that engagement in organizational learning practices provides critical information for schools seeking to improve. Specifically, use of a monitoring system designed to measure

attributes of effective schools offers information about school processes that can guide development of foundational solutions to student achievement.

### **Theoretical Framework**

The theoretical framework of this study is Organizational Learning Theory (Leithwood et al., 2006). DiBella and Nevis (1998) defined OL as the use of past experiences to make better decisions in the future. It is designed to be a model for detecting and correcting problems to improve organizational effectiveness (Finnigan & Daly, 2012). In the context of school improvement, OL is proposed as a sustainable method for change and an opportunity for continuous improvement (Thornton, Shepperson, & Canavero, 2007). Schools, often prone to reacting and adapting to demands, are less skilled at tactics proactive in nature (Collinson et al., 2006). OL is intended to be a proactive methodology that examines both process variables and outcomes when developing SIPs (Anderson, Leithwood, & Strauss, 2010). This represents an alternative to focusing solely on standardized tests and annually reacting to results by implementing new initiatives. According to proponents, schools engaged in OL become capable of examining and exploiting existing knowledge, as well as searching for new information from a range of sources (Erdem, Ilgan, & Ucar, 2014). This involves utilizing strategies and structures that strengthen the capacity to plan and execute change in dynamic environments (Schechter, 2008). Effectiveness is systematically monitored and if gaps in performance are found, modifications are made (Thornton et al., 2007). Some proponents suggest that schools engaged in OL are capable of becoming a learning organization with SIPs comprised of foundational solutions to student achievement (Schechter & Qadach, 2012).

**Systems thinking as a component of organizational learning.** Due to increasing interest, descriptions of how to engage in OL emerged. This usually involves the identification of systems thinking as one of the critical components to OL (Cheng, 2011). Senge (1990) explained that systems thinking is the ability to understand interactions and relationships in complex, dynamic environments. This involves viewing the whole organization and the interrelationships of the parts of the whole to each other. Systems thinking is described as the art of simplifying complexity and about seeing through chaos, managing interdependency, and understanding choice (Shaked & Schechter, 2013). Proponents suggest schools are highly complex organizations that require a systems thinking approach (Senge et al., 2000). According to Thornton et al. (2007), schools often fail to understand the interconnectedness of organizational components. As a result, planned changes often address symptoms, not the underlying root causes of problems, and therefore meaningful improvements do not occur.

Engaging in OL with systems thinking is linked to discussions regarding what constitutes school systems. Seeking to identify specific components leads some to consider research on effective schools (Demetriou & Kyriakides, 2012). This body of literature offers numerous variations of what attributes are evident in high performing schools. Information derived from this research is often used as a framework for those seeking to understand schools from a systems perspective (Scheerens, 1991). Viewing systems in the context of key attributes is described as a researched based approach to understanding the processes of how schools function (Kyriakides & Campbell, 2004; Thornton et al., 2007). Selecting established attributes of effective schools provides a system of processes to understand and evaluate when attempting to improve critical

outputs (Halverson, 2010; Wasler, 2009). This type of approach to OL in schools is intended to enhance the usefulness of information used in school improvement planning.

### **Using monitoring systems to assess effective organizational learning.**

Proponents of OL outline that mechanisms to collect information are essential for systems thinking and effective OL to occur (Schechter, 2008). These mechanisms are often defined in terms of monitoring systems that assess system components. Leithwood et al. (2006) suggested effective OL depends significantly on the amount and quality of systems related information available to the organization. Information acquired with the use of a monitoring system offers a foundation for new learning. Monitoring systems can serve as an effective method for developing organizational capacity to learn from prior practices and to intentionally shape practice to achieve anticipated ends (Halverson, Grigg, Prichett, & Thomas, 2007). In this context a monitoring system can be defined as a concise description of what should be and a process to determine what is actually taking place (Leithwood et al., 2006). For schools the use of a monitoring system represents a shift from relying simply on output data. Shen and Cooley (2008) reported very few schools utilize a comprehensive monitoring system and subsequently only use data from standardized tests to make decisions.

With a systems thinking framework, monitoring systems can be used to provide feedback on a set of specific processes (Scheerens, 1991). Advocates contend collecting information in this manner can illuminate the extent to which schools are successfully exhibiting key research-based attributes (Halverson, 2010; Wasler, 2009). This offers the potential for monitoring to serve as the vehicle for systems thinking that results in OL. School stakeholders become equipped to holistically evaluate a system of attributes and

identify specific areas to target for improvement (Murray, 2013). As a result, SIPs can be developed to address underlining issues rather than symptoms (Porter, 1991). Research is available that suggests monitoring systems that inform systems thinking can enable a level of OL that produces effective school improvement (Leithwood et al., 2006). The present study seeks to contribute insight on the relationship between organizational monitoring system practices and school improvement. A specific focus is allocated on the use of comprehensive organizational monitoring designed to measure school attributes and levels of student academic achievement.

### **Statement of the Problem**

The current context of K-12 education has encouraged a strong focus on standardized test results to inform school improvement planning. Concerns about this phenomena center around the methodology used to determine actions intended to improve student achievement. Some educational experts suggest many schools rely solely on test results to develop SIPs. Subsequently, solutions often address symptoms rather than foundational issues. As a result, schools fall into a cycle of selecting new initiatives that do not produce sustainable improvements. The concept of becoming a learning organization by using a monitoring system to inform systems thinking is presented as an alternative approach. A range of studies demonstrate a significant relationship exists between OL models and student achievement. Although empirical evidence exists that supports OL in schools, studies on the prevalence, composition, and impact in American K-12 education is limited. Prior research in this area primarily investigated the formal implementation of OL practices through the assistance of outside experts. This study is intended to assess the relevance of OL in the context of high stakes accountability

experienced by American schools. Research methods are designed to focus on current OL practices in the field and their effectiveness. As such, the problem this study addresses is: Does a significant relationship exist between changes in reading and math proficiency rates in public middle schools and the school's implementation and use of organizational monitoring system practices? The study findings result in conclusions on the relevancy of OL in schools.

### **Purpose of the Study**

This study seeks to investigate the relationship between the collection and use of process data and improvements in organizational effectiveness. The first purpose of the study was to examine the practice of administering an annual staff survey designed to collect process data related to school attributes, and determine if the implementation of an annual staff survey was linked to a positive impact on student test scores in reading and math. This addressed the first research question: Is there a significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's use of an annual staff survey that collects process data related to the occurrence of school attributes? The study population includes public middle schools in Washington State that at least annually administer to certificated and classified staff members a survey instrument that measures the occurrence of one or more school attributes.

The second purpose was to examine the type of data used in SIP development and student achievement levels to answer the second research question: Is there a significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and



the school's use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a SIP? The study population includes public middle schools in Washington State that develop SIPs based on data collected from a survey instrument that measures one or more school attributes.

The third purpose was to examine the use of comprehensive organizational monitoring and student achievement levels to answer the third research question: Is there a significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's implementation of comprehensive organizational monitoring? Systematic use of multiple organizational monitoring system practices was utilized to represent the term comprehensive organizational monitoring. The study population includes public middle schools in Washington State that use a range of organizational monitoring system practices.

### **Hypotheses of the Study**

Three research questions were utilized to guide the construction of the study. Investigation of the research questions involved the development of hypothesis statements. A null and alternative hypothesis statement were utilized for each research question. This resulted in the creation of the six hypothesis statements outlined below.

**Hypothesis (Null) 1.** There is no statistically significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's use of an annual staff survey that collects process data related to the occurrence of school attributes.

**Hypothesis (Alternative) 2.** There is a statistically significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's use of an annual staff survey that collects process data related to the occurrence of school attributes.

**Hypothesis (Null) 3.** There is no statistically significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan.

**Hypothesis (Alternative) 4.** There is a statistically significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan.

**Hypothesis (Null) 5.** There is no statistically significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's implementation of comprehensive organizational monitoring.

**Hypothesis (Alternative) 6.** There is a statistically significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's implementation of comprehensive organizational monitoring.

## **Research Methods**

A correlational research design was used to investigate the relationships between organizational learning practices and student academic achievement. Purposive sampling was utilized to select sample schools for the study. This involved researcher determined criteria developed to identify schools functioning in a complex organizational environment. Three predictor variables and one criterion variable served as the basis for data collection and statistical analysis. The first predictor variable was school use of an annual staff survey that collects process data related to the occurrence of school attributes. The second predictor variable was school use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan. The third predictor variable was school implementation of comprehensive organizational monitoring. Systematic use of multiple organizational monitoring system practices was utilized to represent the term comprehensive organizational monitoring. A primary analysis was used to answer each research question. In addition, a secondary analysis was used investigate levels of validity and generalizability.

A composite score comprised of changes in the percentage of students proficient in reading and math served as the criterion variable. Data collection involved the administration of a researcher developed survey to sample school principals, analysis of school surveys, analysis of demographic information, and retrieval of standardized test results. Effort was made to enhance the validity and reliability of the survey instrument through the use of a pilot process and statistical analysis. Research survey results were utilized to categorize schools and construct a survey scale score. Statistical analysis

involved evaluation of parametric assumptions and subsequent computation of bivariate correlation statistics and multivariate multiple regression statistics. A qualitative analysis was conducted on individual schools surveys to verify the validity of quantitative data.

### **Significance of Study**

The conclusions of this study may be significant at substantive and practical levels. Substantively, the study extends OL research by providing data for schools in the United States. Although the concept of monitoring processes to inform SIP development was frequently discussed by American educational experts between 1985 and 1995, empirical investigation is limited. Consequently, investigating OL in American schools provided useful information as the study allowed for evaluation of OL practices in the context of high stakes accountability. The study supports conclusions regarding the prevalence, composition, and impact of the OL practice of collecting and using process data. As a result, this study provides insight on the current state of organizational learning practices in American schools. The study also contributes to the existing body of knowledge and literature on OL theory. The inclusion of multiple data sources and analyses provided insight on the impact of collecting and using information about critical school processes. This highlighted the relevance of OL theory in the context of school improvement. Qualitative and quantitative data supported the OL theory of utilizing a systems thinking approach to develop foundational solutions that positively impact student achievement. The study offers evidence that organizational monitoring practices based on school attributes may facilitate systems thinking when developing school improvement plans. This study demonstrated the value of evaluating data quantitatively

to describe the role of process data and systems thinking in school improvement decision making.

Practically, the study shows local school leaders that OL practices may be a viable methodology for school improvement planning. The data conclusions may provide valuable information for better understanding the value of using a monitoring system to collect process data based on school attributes. Provided the immense pressure to raise test scores, the use of process data offers an alternative to focusing solely on tests results to develop SIPs. This may serve as a solution for schools seeking to deviate from a continual cycle of responding to tests scores each year with a wave of new initiatives that are not successful. In a time when schools are expected to develop highly effective SIPs, this information could be informative. Parties interested in this information could include school administrators, teachers, central office staff, college preparatory programs, the Office of the Superintendent of Public Instruction, and others.

### **Structure of Dissertation**

The framework of this dissertation has been organized into four subsequent chapters, entitled: Literature Review, Research Methods, Results, and Discussion of Results.

Chapter Two contains a detailed review of the theoretical construct of organizational learning, which is the foundational construct of this study. A summary of quantitative and qualitative research related to the organizational learning practices of monitoring organizational processes and systems thinking is presented and critiqued. This summary examines the formal implementation of organizational learning models and addresses potential gaps of knowledge in the literature. The chapter also includes a short

discussion of various ways in which a monitoring systems can be used to facilitate the development of SIPs.

Chapter Three includes a description of the methodology utilized in this study. The hypotheses based on the research questions will be presented. The research design, including participant selection and assignment, validity and reliability of the instrumentation utilized, and procedural components are reviewed in detail. In addition, the specific data analysis and statistical methods used in this study are discussed.

Chapter Four includes a comprehensive summary of the results for the study. Descriptive and inferential statistics linked to the research questions are summarized in both narrative and table format. An outline of the assumptions underlying the statistical processes are included. The primary findings and/or trends in the data results are identified for discussion in the final chapter.

Chapter Five provides a discussion of the statistical and practical significance of the research findings as well as a comparison to findings in prior empirical studies. The discussion also addresses the limitations, the threats to internal and external validity, and suggestions for improvement to the study. Finally, the chapter concludes with recommendations for further study in the area of organizational learning practices and student achievement.

## **Chapter Two**

### **Review of Literature**

Chapter Two provides a review of theoretical and empirical literature essential to the development of the study. Conceptualization of the research questions and methodologies are based on the theoretical constructs of school improvement, organizational learning (OL), systems thinking, and models of effective schools. A review of each theoretical construct is provided in order to support the rationale and conclusions of the study. The chapter also includes a summary of quantitative and qualitative empirical research related to the OL practices of monitoring organizational processes and systems thinking. This involves a focus on formal implementation of OL models. In addition, potential gaps of knowledge in the literature as well as various ways in which monitoring systems can be used to facilitate the development of school improvement plans (SIP) are discussed.

#### **Theoretical Frameworks**

**School improvement.** School improvement represents the foundational theoretical construct of the present study. The primary purpose of the study is to contribute knowledge on how to improve school organizations. Conceptualization of school improvement theory is essential to identifying appropriate improvement methodologies. School improvement is rooted in theoretical ideas about organizational effectiveness. Organizational improvement practices are commonly traced to the work of W. Edwards Deming, as he led the revitalization of the Japanese industry after World War II, and are built around a conceptual model of continuous improvement (Bird, Dunaway, Hancock, & Wang, 2014). The pursuit of improvement using standardized

methodologies is a widely accepted practice and demonstrates universal applicability. A number of projects during the 1980s and 1990s demonstrated improvement methodologies are relevant to virtually all industries, including government, education, and health (Juran & Riley, 1999). This resulted in wide ranging adoption of organizational improvement practices.

Emergence of organizational improvement theory contributed to current role of school improvement. The concept of organizational improvement in schools surfaced as early as 1978 with schools beginning to advocate for funding to support improvement processes (Edmonds, 2012). Some experts suggested recent years witnessed the most widespread, intense, public, comprehensive, and sustained effort to improve education in history (Van Der Voort, 2014). This represented growing attention focused on the performance of individual schools and contributed to the use of terms such as school restructuring, school reform, school change, and school improvement (Goldenberg, 2003). As a result, many models of school improvement now exist (Fullan, 2008). The present study seeks to contribute to an understanding of how to effectively engage in school improvement by investigating specific organizational learning practices.

Although school improvement processes were used in some form or another for decades, the creation of a SIP recently became an institutionalized component of the educational system (Dunaway et al., 2012). The passage of NCLB in 2001 prompted most states to either mandate or strongly encourage schools develop and implement a SIP. This process is typically represented by the development of a school improvement document that outlines assessment goals and specific actions (Fernandez, 2011). SIPs usually define processes that inform actions implemented and monitored for success



(Holmes & Maiers, 2012). In many cases, the SIP is created by a representative team of school staff members and aligned with school structures, resources, and professional development (Barnes, 2004). The plan is intended to form the framework for continuous school improvement and serve as a monitoring instrument to measure progress towards specific areas of whole-school development (Van Der Voort, 2014). Proponents have suggested that a school improvement model of strategic planning is critical to achieving the learning for all standard (Knoff, 2007).

Literature on school improvement models illuminates the relevancy of utilizing organizational learning practices. The articulation of specific school improvement protocols offers insight on how OL can be infused into the school improvement process. National and international review of school improvement models reflect substantial variability in processes and components (Adelman & Taylor, 2007). School improvement is described in a multitude of ways, including identification of the school improvement process as a fluid, natural process, a management tool, and even its own discipline (Education Quality and Accountability Office, 2005). Differences are often exhibited in the length of the school improvement cycle and the number steps for creating a plan. Many states provide extensive protocols for the development of a SIP in order to extend support and foster consistency (Van Der Voort, 2014). State requirements often reflect alignment with practices outlined in NCLB. Common components of SIPs include scientifically based research, policies, and practices related to core academic areas, professional development, measurable objectives, and parental involvement (Dunaway et al., 2012). Evaluation of the SIP is also frequently referenced, however, evaluation mechanisms and practices are rarely outlined in detail. Despite the provision of a

sequential development process, procedures for evaluation are often absent. This represents a void in describing the means, methods, and tools used to evaluate the impact of a SIP.

Danielson (2002) outlined a theoretical framework for school improvement that addresses the policies and programs of the school organization. Policies are defined as the school organization policies and practices that affect students, policies and practices that affect staff, and linkages beyond the school (p. 43). According to Danielson, programs represent the curriculum, assessment, team planning, learning support, and teaching (p. 77). Development of a SIP should be conducted with awareness of the distinction and interrelation between the categorization of policies and programs. Danielson explained that in order for effective planning to occur, school stakeholders must answer four essential questions. The first question is what the school desires to accomplish. A clear articulation should be developed related to the specific outcomes the school intends on producing. The second question is what school stakeholders believe philosophically about the schooling process. This includes ideas about teaching, learning, environmental conditions, and the development of children. The next question that should be answered is what is known about schools. Answering this question identifies practices supported by empirical research and establishes a standard for selecting specific strategic initiatives. The final question centers on what is currently being done. This illuminates the current realities of the school, which are essential to identifying strengths and areas in need of improvement.

Lindahl and Beach (2013) provided a sequential model for SIP development. This model intends to encompass critical factors of information collection, decision making,

implementation, and ongoing evaluation. The authors identified distinct phases, but indicated overlapping occurs and clear separation is not always discernable. Despite the provision of a sequential process, school improvement is described as recursive in nature. As evaluation data becomes available, it is often necessary to modify previous decisions and actions.

The beginning phase of school improvement is identified by Lindahl and Beach (2013) as initiating evaluation. Their inclusion of the phase is based on the rationale of originating from a strategic planning perspective, where evaluation frames the issues. Strategic planning requires assessments of the organization's health and connections to external environments. Diagnostic evaluations of this nature are often characterized as needs assessments.

According to Lindahl and Beach (2013), the initiating evaluation phase is followed by the pre-planning phase. The purpose of pre-planning is to evaluate the school's readiness to begin the school improvement process. Readiness is evaluated in relation to the specific improvement process under consideration and potential changes likely to result from the process. This requires a review of the school's climate and culture, historical improvement practices, current initiatives, and available resources. Evaluation of readiness informs the school's decision to proceed, modify readiness factors, or abandon the process.

Determination to move beyond pre-planning leads to the planning phase. Lindahl and Beach (2013) indicated planning typically involves the establishment and prioritization of goals and objectives. This planning informs the development of a specific action plan that outlines steps for implementation, responsible parties, required

resources, and criteria for success. It is widely acknowledged that a wide range of methods exists for completing tasks associated with the planning phase. Prior to engagement in the planning phase, it is recommended schools adopt a defined approach.

The implementation phase is followed by the completion of the planning phase. In this phase actions outlined in the SIP are implemented. Lindahl and Beach (2013) emphasized evaluation throughout the implementation phase. This centers on evaluation of the implementation process, evaluation of the programs or methods being implemented, effects on faculty, staff, and students, staff development associated with implementation, and effects on school climate and culture. Focus is provided to both the effect and fidelity of implementation.

Lindahl and Beach (2013) identified institutionalization as the final phase of the school improvement process. Institutionalization represents no defined beginning or end, but is characterized by evaluation of the current reality. Evaluation seeks to determine if implementation resulted in deeply ingrained changes to the school's culture and practices. The institutionalization phase requires planning, action, and evaluation to ensure high levels of sustainability. Evaluation is identified as a critical factor necessary to ensure adaptations are efficiently implemented. Multiple measures are recommended to ensure formative and summative information provide a holistic understanding of the improvement plan and overall conditions of the school.

Articulation of school improvement models offers insight on how organizational learning practices can be utilized to develop SIPs. The outline of specific protocols and practices support the relevancy and rationale for implementing the organizational

learning practice of using a monitoring system to collect feedback about current school realities.

**Organizational learning.** Emergence of school improvement resulted in a focus on conditions necessary for effective SIP development (Holmes & Maiers, 2012). With the emergence of standardized tests and subsequent pressure to develop SIPs that improve results, many schools now focus solely on test results. School feedback comprised entirely of test results prompted concern SIPs do not utilize information that can effectively support development of foundational solutions to student achievement. As a result, pursuit of alternative approaches to school improvement contributed to ideas about functioning as a learning organization (Collinson et al., 2006). Learning organization theory serves as a vision for school improvement and OL is a perspective on the processes for how to become a highly effective school system (Leithwood et al., 1995). Proponents have suggested OL practices represent an alternative to relying on tests results to develop SIPs. The mechanisms of OL are described by some as the best method for addressing the complex nature of public schools. Engagement in OL is identified as an effective method for understanding critical processes that impact school outcomes. In relation to the present study, theoretical models are subsequently reviewed to provide rationale for the investigation of specific organizational learning practices.

DiBella and Nevis (1998) defined OL as the use of past experience to make better decisions in the future. Bowen, Rose and Ware (2006) explained OL is associated with a core set of conditions and processes that support the ability of an organization to value, acquire, and use information and tacit knowledge acquired from employees and stakeholders to successfully plan, implement, and evaluate strategies to achieve

performance goals. Garvin (1993) contended OL is characterized by creating, acquiring and transferring knowledge, and at modifying behavior to reflect new knowledge and insights. It is designed to be a model for detecting and correcting problems to improve organizational effectiveness (Finnigan & Daly, 2012). OL is proposed as a sustainable method for change and opportunity for continuous school improvement (Thornton et al., 2007). Proponents have suggested schools are prone to reacting and adapting to demands and are less skilled at proactive tactics (Collinson et al., 2006). The utilization of organizational learning practices represents a proactive methodology that examines both process variables and outcomes when developing SIPs (Anderson, Leithwood, & Strauss, 2010). This represents an alternative to focusing on standardized tests and annually reacting to results by implementing new initiatives. Schools engaged in OL develop the capacity to examine and exploit existing knowledge, as well as acquire new information from a diverse sources (Erdem et al., 2014). This involves strategies and structures that enhance organizational ability to plan and execute change (Schechter, 2008). Improvement is strategically monitored and if gaps in performance are found, modifications are made (Thornton et al., 2007). Fullen (2008) contended organizational success depends on a system-wide approach to learning and that school systems should embrace and effectively promote OL. It has been suggested schools engaged in OL are capable of becoming a learning organization with SIPs comprised of foundational solutions to increasing levels of student achievement (Schechter & Qadach, 2012).

The historical context of OL can be traced back several decades. In 1978, Argyris and Schön (1978) formally introduced the theory of OL, suggesting organizations can develop the ability to learn and grow in a manner similar to individual learning (Evans et

al., 2012). Since the original introduction of OL, the theory evolved with the assistance of many theorists. According to Argyris and Schön (1996), OL and individual learning are interrelated factors, as learning is dependent on the use of strategies to systematically connect individual and collective learning into skills and knowledge that enhances organizational effectiveness.

Argyris and Schön (1978) outlined three types of OL: single-loop learning, double-loop learning, and deuteron-learning (Collinson et al., 2006). Single-loop learning is a process intended to rectify problems in an organization that do not impact beliefs, values, and policies that direct the organization (Argyris & Schön, 1996). This type of learning is characterized by routine changes and remaining in the current operating paradigm of the organization. Parameters involve determining how best to achieve existing goals and objectives, and how to keep organizational performance in the range specified by existing norms (Argyris & Schön, 1978). Alterations in practice produced by single-loop learning are limited to behavioral changes motivated by compliance.

Double-loop learning is a generative process that alters the core of an organization (Argyris & Schön, 1978). Actions include single-loop learning as well as changes to the organization's foundation. Change in this type of learning is often characterized as both behavioral and cognitive (Collinson et al., 2006). Learning involves a careful analysis of underlying assumptions, values, and beliefs that guide organizational actions (Argyris & Schön, 1996). This process requires review of incompatible norms by setting new priorities and weighting norms, or by restructuring norms with associated strategies and assumptions (Argyris & Schön, 1978). Double-loop learning requires close examination of values or assumptions that historically supported organizational goals, but demonstrate

the potential to impede future improvement efforts. When this type of learning occurs, the values, beliefs, and policies directing the organization shift. As a result, outcomes often involve transformational or radical change and innovation (Finnigan & Daly, 2012).

Argyris and Schön (1996) indicated that deuterio-learning is the third type of OL. Deuterio-learning is described as the manner in which organizations learn how to learn. This type of learning requires awareness and commitment to the learning processes that create structure for learning. Individual characteristics are considered to be critical to promoting deuterio-learning. In addition, Argyris and Schön identify communication, information systems, physical environment, inquiry procedures, and incentives as environmental factors that can encourage or inhibit OL.

Fiol and Lyles (1985) provided a framework of contextual factors that support OL: culture, strategy, structure, and environment. Culture is defined as the organization's norms, values, beliefs, and assumptions that are manifested in symbols, artifacts, rituals, ceremonies, overriding ideologies, and behaviors. Culture is often used to predict actions and levels of OL. Strategies are a function of the organization's learning capacity as well as an influence of capacity. These strategies outline the goals of the organization and the range of actions that are utilized. Fiol and Lyles indicated strategies influence learning by providing a boundary to decision making and a context for the perception and interpretation of the environment. Decision-making structures demonstrate substantial influence on the flexibility of organizational members. Centralized structures are efficient at reinforcing past behavior and ensuring the reliable performance of routines. In contrast, decentralized structures encourage learning and reflective action taking. This occurs by distributing the demand for thinking about new information to a wide range of



organizational members. External and internal environments impact OL based on levels of turbulence. Turbulence is defined as a combination of complexity and instability. OL is dependent on establishing consistency and change in a manner that maintains a healthy amount of turbulence.

Senge (1990) significantly enhanced attention on the theory of becoming a learning organization to improve effectiveness (Erdem et al., 2014). His work outlined the components of OL necessary for operating as a learning organization. This included defining organizations as learning when people continually explain their capacity to create the results they truly desire, new and expansive patterns of thinking are nurtured, collective aspiration is set free, and people are continually learning to learn together (Senge, 1990). The learning that matters is in groups, because results produced by an organization are developed collectively (Senge et al., 2000). Knowledge developed at the collective level includes diffusion, dialogue, differentiation, and deliberation among stakeholders (Senge, Roberts, Ross, Smith, & Kleimer, 1994). This represents a contrast from personal knowledge and perspectives acquired by an individual learning alone. According to Senge, learning and adaptability is dependent on demonstrating attributes that comprise the components of personal mastery, mental models, shared vision, team learning, and systems thinking.

Personal mastery is described as the ability to continually focus individual energy on understanding the reality of the organization (Senge et al., 1994). With personal mastery, individuals consistently deepen their vision of the organization and seek to understand current and future realities (Cheng, 2011). Personal development and fulfillment are key in reconciling individual visions and true characteristics of the

organization. Senge (1990) explained that personal mastery increases when a clear vision emerges. This vision translates into a roadmap to guide and motivate individuals to reach an ideal state for the organization. Organizations promote personal mastery by fostering cultures that value truth, encourage individuals to challenge the status quo and nonproductive mental models, and continuously compare the articulated vision with current reality (Evans et al., 2012).

According to Senge (1990), mental models define the beliefs and assumptions individuals use to understand the organization. Mental models are characterized by ongoing analysis of macro and micro factors in the organization that impact behavior. Senge et al. (2000) contended mental models ultimately shape perspectives in the organization and impact the capacity to envision future potential. Mental models inconsistent with reality and misaligned with organizational goals negatively impact the ability to progress. Development of effective mental models requires that individuals scrutinize personal assumptions and generalizations regarding the organization, and remain receptive to the scrutiny of others. Organizations are encouraged to enhance mental models through implementation of structures that facilitate open discussion. Senge et al. (1994) identified inquiry and reflection as critical skills necessary to understand individual and organizational mental models.

Shared vision is the third component of Senge's theoretical model and represents the collective caring of the organization. The process of vision alignment provides a positive force for navigating the change process. Senge et al. (2000) indicated shared vision involves ongoing consensus building regarding how the organization should function. This fosters commitment, ownership, and motivation necessary to achieve

recognized goals. Individuals respond to the development of a shared vision on a continuum ranging from committed to apathetic (Senge, 1990). Organizational visions may be attributed high value, however, if responses are apathetic and counter to the vision, growth stagnates. Collective involvement in vision development serves as a tool to enhance levels of commitment to the vision.

Team learning is the ongoing enhancement of collective capacities and team effectiveness (Senge, 1990). Senge explained that team learning involves the process of aligning and developing the capacity of a team to create the results organizational members desire. This requires individuals in the organization to set aside personal assumptions and work together. Most organizations attribute a high value on team decision making. Senge et al. (2000) contended productive team learning requires teams to think deeply about complex issues, coordinate effectively, and integrate with others teams in the organization. Team learning is perceived to be impactful in comparison to individual learning. Teams capable of functioning effectively together, align efforts toward the shared vision, and utilize the strengths of each member to produce positive outcomes.

The final component of systems thinking pervades all dimensions of the model. According to Senge (1990), systems thinking is the capacity to identify and understand interrelationships among parts in the organization rather than linear cause-effect relationships. Individuals are able to move beyond isolated aspects and see the organization on a holistic level. This is demonstrated by being attune to how parts are related to the whole in ever-changing conditions. As a result, systems thinking enables

various parts of the organization to work together and engage in high levels of learning (Senge et al., 1994).

**Systems thinking.** Systems thinking represents a core theoretical construct for the organizational learning practice of using a monitoring system to measure attributes of effective schools. Review of systems thinking theory informs the development of specific organizational learning methodologies. The collection of process data related to attributes of effective schools represents a systems thinking approach to school improvement. The present study seeks to understand how OL through the use of systems thinking is related to levels of student academic achievement.

Senge's (1990) theory of systems thinking is based on a system dynamics paradigm that emphasizes feedback loops, delays, and non-linear behavior or relationships. According to Senge et al. (1994), it is essential to emphasize feedback loops and account for the speed influencing factors that impact feedback loops. Feedback loops represent potential to be positive, known as reinforcing feedback loops, or negative, known as balancing feedback loops (Senge, 1990). Positive feedback loops are characterized by a change in one part of a system that causes a change in another part of the system. Utilization of positive feedback loops are effective for creating change, but result in negative outcomes if not curbed by negative feedback loops. This occurs because one element of the feedback loop eventually works back to reinforce or amplify original change, which then introduces potential for the system to run out of control. A negative feedback loop occurs when a change in one part of a system causes a change in another part of the system, which then counteracts the original change. Senge et al. (1994) indicated systems can self-regulate and avoid running out of control. Negative

feedback loops allow systems to stabilize, maintain current state, and improve moving forward, by adjusting based on feedback received from the environment.

Delay occurs when feedback loops do not produce instant feedback to the system. Senge (1990) suggested delays are often subtle, ignored, or underestimated when changes are applied. The void, or delay, of a feedback can produce high levels of influence in a system. For example, reinforcing loop delays can create unnecessary scrutiny in a process because growth does not come as quickly as expected. Balancing loop delays demonstrate the potential to drastically alter the behavior of the system. Unacknowledged delays cause individuals to respond impatiently and wonder why expected results are not taking place. Senge (1990) indicated that it is critical to identify and account for delays as they are often the source of organizational waste. The removal of delays represents a method for accelerating the cycle time for change.

Senge (1990) provided a conceptual systems thinking framework that includes knowledge and tools developed to illuminate full patterns and help individuals understand how to change effectively. The primary tool is archetypes represented by behavior patterns of common social systems. Archetypes patterns are based on experiences derived from numerous system dynamics models. Senge identified eight archetypes that can be used to engage in systems thinking.

1. Balancing process with delay is when a person, group, or organization acting toward a goal, adjusts behavior in response to delayed feedback. If they are not aware of the delay, more corrective action is used than necessary or the goal is abandoned due to perceived lack of progress.

2. Limits to growth is described as a process that feeds on itself to produce a period of accelerating growth or expansion. However, growth slows down and eventually stops, and may even reverse, beginning an accelerating collapse. Growth is produced by a reinforcing feedback process. The slowing occurs due to a balancing process initiated as a limit is approached. The limit may be a resource constraint, or an external or internal response to growth. Accelerating collapse stems from the reinforcing process operating in reverse, to generate increasing contraction.
3. Shifting the burden is a short term solution to correct a problem with seemingly positive immediate results. As reliance on the solution increases, fundamental long-term corrective measures are utilized less often. Over time, the capabilities for the fundamental solution may atrophy or become disabled, leading to greater dependence on the symptomatic solution.
4. Eroding goals is represented by shifting the burden type of structure in which the short-term solution involves letting a long-term, fundamental goal decline.
5. Escalation occurs when two entities each see their welfare as depending on a relative advantage over the other. If an entity gets ahead, the other is threatened, leading it to act with increased aggression to reestablish its advantage, which threatens the first entity, prompting it to respond with more aggression. Entities may perceive aggressive behavior as a defensive mechanism, but each aggressive action results in a buildup beyond any original intent.

6. Success to the successful is described as two activities competing for limited support or resources. The more success one achieves, the more support it acquires, thereby starving the other.
7. Tragedy of the commons is when individuals use a commonly available but limited resource based solely on individual need. They are rewarded at first for using it, but eventually diminishing returns occur, which leads to intensifying efforts. Eventually, the resource is either depleted, eroded, or completely used up.
8. Fixes that fail is a fix that is effective in the short term, but unforeseen long-term consequences requires even more of the same fix.

Pursuit of OL represents a contributing factor in the growing emphasis placed on systems thinking. Systems thinking traces back to early human history, as it emerged from thinking in the golden age of Greece during the pre-scientific stage. Renowned philosophers Plato and Aristotle contributed to the idea of systems thinking, eventually leading Hegel to proclaim the whole is more than the sum of the parts (Skyttner, 1996). Formal recognition of systems thinking applied to management theory evolved from the Industrial Revolution. In 1940, Ludwig von Bertalanffy, articulated the concept of systems thinking to manage technological complexities stemming from the fields of engineering and science (von Bertalanffy, 1968). He contended individuals and organizations must be examined in the context of their environment, as entities do not operate in isolation, but are part of a larger network.

The construct of systems thinking is represented in a variety of contemporary theoretical models. Shaked and Schechter (2013) described systems thinking as the art of

simplifying complexity and about seeing through chaos, managing interdependency, and understanding choice. Systems thinking was articulated by Sterman (2000) as the ability to see the world as a complex system, requiring an understanding that all variables are connected in some way. Richmond (1994) contended systems thinking is the art and science of making reliable inferences about behavior by developing extensive understanding of underlying structures.

Systems thinking models often include the identification of inputs and outputs. Inputs to a system include a number of variables such as political influences, regulations, social influences, raw materials, monetary resources, technologies, suppliers, employees, competitors, customers (Cusins, 1994). This demonstrates the dependency of organizations on both internal and external environments to succeed. Inputs migrate through a process that includes alignment, movement, and coordination designed to produce the goals established for the system.

System outputs are functions, attributes, or behaviors that would not exist without the operation of the system (Harrington, Carr, & Reid, 1999). Outputs are concrete outcomes produced by processes in the system, such as products or services. Transforming inputs to outputs is the process that facilitates organizational goal attainment. Removal of individual components alters the disposition of the system and impacts outputs characteristics.

Checkland (1981) outlined a systems thinking model built on a comprehensive picture of the problem situation from multiple perspectives in the organization. The model identified two streams of consciousness: logic-driven and culture-driven, which incorporate the social and political factors represented in problem situations. The logic-



stream involves identifying relevant systems, modeling systems, comparing models and the real world, and determining desired and feasible changes based on cultural analysis. Interaction of the streams facilitates understanding problems in complex organizations. Checkland's systems thinking theory avoids reductionist ideas inherent in natural sciences where analytical methodologies are dominant. This suggested organizations acknowledge multiple perspectives and accept existence of multiples realities for any specific problem. Effective systems thinking requires conceptual model development of problems that can be compared to real-world situations. According to Checkland, social systems contain ambiguous and indeterminate goals. As a result, no isolated decision can force the system to achieve a goal. Utilization of systems thinking models foster understanding and the creation of interventions that solve problems.

Mitroff and Linstone (1993) indicated systems thinking represents an effective methodology for navigating complex organizational environments. This requires systems thinking from a technical perspective, organizational perspective, and personal perspective. Each perspective contributes unique insight necessary for obtaining a comprehensive understanding of problems. Mitroff and Linstone contended singular reliance on technical perspective is problematic when facing high levels of complexity. The technical perspective addresses problems objectively and quantitatively, which ignores human and organizational factors. As a result, individuals often resist implementation of solutions developed from the technical perspective. Scientists gravitate to the technical perspective, while leaders prefer the personal perspective, and other stakeholders advocate for utilizing the organizational perspective. Developing solutions from a single perspective in a complex organizational environment is highly

problematic. Mitroff and Linstead proposed a sweeping in process that incorporates all three perspectives. Sweeping in should be conducted to acquire the broadest view of any problem in the organization. This is described as unbounded systems thinking because the whole is evaluated from every possible angle.

Advocates have suggested schools are highly complex organizations that require a systems thinking approach. According to Thornton et al. (2007), schools are often unaware of interconnectedness in the organization. As a result, OL does not occur and planned changes often target symptoms, not the underlying root causes of the problem. This dynamic leads to unsuccessful solutions and frustrations throughout the organization. Therefore, understanding the importance and attributes of systems thinking is identified as vital knowledge for organizations. The present study seeks to incorporate systems thinking theory in the investigation of the relationship between using a monitoring system designed to measure attributes of effective schools and levels of student academic achievement. Systems thinking is represented by the investigation of monitoring systems that collect systemic process data.

**Effective school systems.** Literature on effective schools provides the criteria for systems thinking in the present study. The engagement of organizational learning through the use of systems thinking requires a clear articulation of system composition. In the context of school organizations, OL with a systems thinking approach is often linked to discussions regarding what constitutes school systems. Identification of specific system components leads some to consider research on effective schools (Demetriou & Kyriakides, 2012). This body of literature offers numerous variations of what attributes are evident in high performing schools. Information derived from this research serves as a

framework for those seeking to understand school organizations from a systems thinking perspective (Scheerens, 1991). Viewing systems through the lens of key attributes is described as a research based approach to understanding critical school functions (Kyriakides & Campbell, 2004). Selecting established attributes of effective schools provides a system of processes to recognize and evaluate when attempting to improve critical outputs (Halverson, 2010; Wasler, 2009).

The effective schools movement initiated investigation of attributes high performing schools have in common (Shannon & Bylsma, 2007). Seminal studies ranging from the 1970s to the present are often used to identify processes for improving schools. This research has suggested there may be no single variable schools can rely on to ensure high levels of student academic performance. However, findings indicates high-performing schools often share the same set of attributes (Edmonds, 1979). According to Edmonds, the effective school process is a school reform framework based on evolving research from both empirical and case studies of schools across the country that have been effective in teaching the intended curriculum to all students. This body of literature identifies various attributes and informs comprehensive models for school reform.

Educational reformers and theorists outline comprehensive models comprised of attributes identified in effective schools research (Shannon & Bylsma, 2007). Development involved detailed analysis to determine which attributes were found most often among high performing schools. Measuring and defining school success represents a complicated task for researchers. Experimental variables and variability fluctuate depending on instrumentation, geography, and demographics (Bloom & Owens, 2011). Performance is typically evaluated in terms of high or dramatically improving scores on

standardized tests. High performing schools offer researchers the opportunity to uncover and identify the factors correlated with student achievement in various socioeconomic, gender, and grade levels (Bloom & Owens, 2011). Most models include five or more attributes; some with as many as eight or nine (Shannon & Bylsma, 2007).

There are numerous models outlining attributes of effective schools (DuFour & Eaker, 1998; Gray, 1990; Lezotte, 1997; Rothstein, 2000). Blankstein (2004) described six principles that are foundational to building professional learning communities capable of achieving school improvement. The principles include common mission, vision, values, and goals, ensuring achievement for all students, collaborative teaming, using data, actively engaging family and community, and building sustainable leadership capacity. Langer (2004) identified characteristics of effective schools as high expectations, challenging curriculum, enriched teaching and learning, professional development, and involvement of parents and community. In *What Works in Schools: Translating Research into Action*, Marzano (2003) outlined school-level factors impacting student learning. The factors referenced are guaranteed and viable curriculum, challenging goals and effective feedback, parent and community involvement, safe and orderly environment, and collegiality and professionalism.

Washington State school improvement specialists from the Office of Superintendent of Public Instruction (OSPI) recognized nine characteristics of high-performing schools (Shannon & Bylsma, 2007). The specialists recommended SIPs incorporate the characteristics entitled: high standards and expectations for all students, a clear and shared focus, effective school leadership, high levels of collaboration and communication, curriculum, instruction, and assessments aligned with state standards,

frequent monitoring of learning and teaching, focused professional development, a supportive learning environment, and high levels of family and community involvement. These characteristics are individually categorized as goals, processes, or supports outlined in a model demonstrating interrelationships between characteristics. In review of effective school research, Scheerens (1991) identified characteristics frequently associated with positive student achievement. This set of characteristics includes a safe and orderly school climate, high expectations of pupils' achievement, educational leadership, frequent evaluation of pupils' progress, clear objectives concerning basic skills, and a cooperative atmosphere among teaching staff.

Leithwood et al. (2006) outlined eight attributes of the school organization believed to make either a direct or indirect contribution to accomplishing outcomes. The attributes were identified as leadership and management, mission and goals, culture and community, planning and instructional services, structure and organization, data-driven decision making, policies and procedures, and community partnerships. According to Leithwood et al., a set of variables comprise each attribute and represent the processes mediating the relationship between school inputs and outcomes. Inputs are defined as the resources available to the school, characteristics of individuals served by and employed in the school, and the nature of the wider social and cultural context of the community in which the school is located. Leithwood et al. indicated outcomes are intended contributions by the school to the socio-emotional and intellectual growth of students and the intended opportunities and dispositions created for all students. The outcomes of student academic achievement typically receives the most attention by school organizations.

Identification of attributes in the Leithwood et al. model involved review of multiple types of empirical literature. This included literature investigating the nature of professional learning communities, research on effective classrooms, schools, and districts, restructuring of school and non-school organizations, and organizational responses to broad social trends. Utilization of multiple literature types serves to recognize the complex nature of school organizations. Leithwood et al. explained the comprehensive model of attributes represent the processes that seem most capable, in light of current evidence, to add sufficient value to school outputs. Enhancing the degree of each attribute in the organization is described as a method for developing a high performing school in the present as well as in the future.

Leithwood et al.'s model serves as the criteria for systems thinking in the present study. The model is intended to be utilized to identify the use of a monitoring system designed to measure attributes of effective schools.

**Monitoring systems.** The use of a monitoring system represents the primary organizational learning mechanism investigated by the present study. Advocates of OL have indicated that mechanisms to acquire information are essential for systems thinking and effective OL to occur (Schechter, 2008). These mechanisms are often characterized as monitoring systems capable of assessing system components. The use of a monitoring system is based on theoretical ideas related to OL, professional learning communities, and data-driven decision making. This theory informs the intent of the present study to investigate the specific organizational learning practice of using a monitoring system designed to measure attributes of effective schools. Leithwood et al.'s (2006) OL theory indicated effective learning is dependent on the volume and quality of systems related

information available to the organization. Information collected through the use of a monitoring system represents feedback and the basis for collective development of new learning. Monitoring systems can serve as an effective method for building organizational capacity to learn from past practice and to intentionally plan new practices to achieve desired outcomes (Halverson et al., 2007). Data driven decision making theory has suggested schools link several key organizational functions together into a cycle for collecting, reflecting on, and acting on feedback data. This involves establishment of group processes to analyze data and create goals for improvement. Implementation of a monitoring system provides a structure for collection, storage, communication, and use of relevant data.

The concept of a monitoring systems is often associated with terms such as self-evaluation, school inspection, formative feedback systems, and needs assessments. In this context a monitoring systems can be defined as a concise description of what should be and a process to determine reality (Leithwood et al., 2006). For schools the use of a monitoring system represents an alternative to relying exclusively on output data. The systematically collected type of data available to schools is often limited in its breadth to the current status of student achievement (Anderson et al., 2010). Standardized tests are perceived to be invaluable and the focus on improving performance is widely recognized as the critical function in school success (Murray, 2013). The use of tests in this manner currently consumes the attention of educational stakeholders. Schools are expected to analyze test data and engage in data-based decision making. Disaggregation of student populations and trend data are expected to illuminate the components of school effectiveness (Coburn & Talbert, 2006). Although data related to student achievement is

critical for schools, experts have suggested standardized test results provide little insight into the causes of achievement or the strategies that might be useful in moving achievement forward.

Shen and Cooley (2008) reported very few schools use a comprehensive monitoring system and as a result only use data from standardized tests to make decisions. Without intersecting student achievement data with school process data, many current data analysis procedures focused exclusively on student achievement often fail to identify the root cause of problems and challenges impacting learning. Schools functioning in this manner focus solely on the output of the school process and vigorously pursue initiatives that improve test scores (Wasler, 2009). Emergence of this practice touched off an explosion of selecting new initiatives. As a result, a culture of incessantly selecting new initiatives is common practices (Fullan, 2008). Selection of initiatives based on test results are incorporated into school improvement plans only to be abandoned the next year when tests results do not increase. This introduced perpetual change as schools constantly seek the next popular idea. Stakeholders often lament that each year brings along a new set of initiatives to adopt (Van Der Voort, 2014).

With a systems thinking perspective, monitoring systems can be used to provide feedback on a set of specific processes (Scheerens, 1991). Inclusion of process measures in a monitoring system provides direct information about the ideal and current realities of the school. Leithwood et al. (2006) contended monitoring systems should collect information on the attributes of effective schools. Proponents suggested collecting information in this manner illuminates the degree to which schools are exhibiting research-based attributes (Halverson, 2010; Wasler, 2009). This knowledge subsequently



provides a foundation for authentic change. Effective monitoring is characterized as a process mainly initiated by the school to collect systematic information about the school functioning, to analyse and judge this information regarding the quality of the school functioning, and to make decision that provides recommendations (Demetriou & Kyriakides, 2012). This introduces the potential for monitoring to serve as the vehicle for systems thinking that results in organizational learning. School stakeholders become equipped to holistically evaluate a system of attributes and identify specific areas to target for improvement (Murray, 2013). As a result, SIPs can be developed to address underlining issues rather than symptoms.

Porter (1991) articulated a monitoring system model based on three core motivations. The first is the need for descriptive information. According to Porter, schools provide educational opportunity, but do not directly produce student learning. It is important to know about the nature of educational opportunity as a direct policy output of schools. A second motivation is to have indicators of school processes that serve as an evaluation instrument in monitoring school reform. Due to the ongoing reform of K-12 education, evaluation of specific reforms is a critical function for all stakeholders. The final motivation for a monitoring system is to provide explanatory information when student output goals are not reached. Monitoring systems may point to possible causes and subsequently possible solutions for inadequacies in school outputs. Porter described a monitoring system model comprised of inputs, processes and outputs. Inputs include fiscal and other resources, teacher quality, student background, and parents and community norms. Processes encompass both organizational and instructional

characteristics of schools. Outputs are represented by achievement, participation and attitude aspirations.

Leithwood et al. (2006) outlined five reasons why schools should utilize a monitoring system measuring school processes. The first reason is processes are ends in their own right. Although schools are often evaluated in terms of final outputs, schools are also the current reality for students. Monitoring processes recognizes the day to day life of students should be exciting, engaging, compelling, and humane. The next reason is equity goals demand process measures. According to Leithwood et al., information about school processes is needed to pinpoint what it is that schools actually do or don't do to alter the predictable effects of socioeconomic status inputs. The third reason is process measures offer clues to school improvement. Although it is not fully understood how schools produce desired outcomes, process information can inform how the school organization can be improved. Leithwood et al. explained the fourth reason is process measures balance the effects of technical shortcomings. Despite the persistence by policy groups that outcomes are measured in the most technically rigorous method possible, recommendations rarely recognize systematic data. In many cases the only outcomes measured are those that can be measured well. As a result, desired outcomes are reduced and begin to shape the school curriculum. Measures of school processes symbolically announce other outcomes matter, and outcomes not directly measured, but expected to develop through measured processes also deserve attention. The final reason articulated is process measures monitor reform initiatives. Incorporating process measures in a monitoring systems provides direct information about the progress being made in implementing reform. Although highly debatably, process measures may actually be a far

more defensible basis for demonstrating a school's accountability and growth than are outcome measures.

Leithwood et al. (2006) also identified a monitoring system model comprised of inputs, processes, and outputs. Inputs are characterized as indirect, alterable direct, and unalterable direct. Some inputs are relatively fixed or hard to alter, whereas others may be altered through intentional intervention by the school. According to Leithwood et al., processes should represent attributes identified in research on effective school and non-school organizations. These attributes demonstrate either direct or indirect contributions to desired outcomes. Outcomes are defined as results produced by school processes that occur immediately or on a long-term basis. Leithwood contends the ultimate test of a monitoring system is it should help schools act more prudently, not simply provide information. This requires that school organizations make a distinction between comprehensive monitoring and strategic monitoring. The latter contends schools must take intentional steps to collect, analyze, and interpret monitoring system data to develop improvement plans.

The use of a monitoring systems represents the primary organizational learning practice intended to be investigated by the present study. Theoretical ideas about monitoring systems provide rationale and relevancy for the selection of this specific practice. For the purpose of the study, the systematic use of multiple organizational monitoring system practices was utilized to represent the term comprehensive organizational monitoring.

## **Empirical Review**

Accumulating evidence indicates higher performing schools function as learning organizations (Silins, Mulford, & Zarins, 2002). Empirical evidence suggests value-added academic outcomes for schools demonstrating characteristics of OL. These schools utilize learning processes, strategies, and structure to strengthen capacity to react effectively and manage change in uncertain and dynamic environments (Louis, 2006). Despite numerous conceptions and promising empirical evidence, OL is rarely operationalized into structures and processes in school realities (Schechter, 2008). OL may be a popular notion in educational literature, however, OL is still considered by many to be ubiquitous and excessively broad, consequently hindering the ability of schools to move from conceptual levels to action and capability. Empirical literature reflects this dynamic as the majority of studies investigate the general degree of OL in schools rather than specific organizational learning mechanisms. This is demonstrated by limited research on the specific organizational learning practice of using a monitoring system based on attributes of effective schools. The following empirical literature review includes studies providing evidence for functioning as a learning organization as well as evidence for specific practices that can be associated with the implementation of a monitoring system. This empirical review supports the theoretical constructs utilized to develop the present study.

Halverson (2010) reported formative feedback systems positively impacted school reform measures. Formative feedback is identified as a systems thinking approach to OL. According to Halverson formative feedback systems describe organizational capacity upon which innovations such as comprehensive school reform, benchmark assessment

programs, and student behavior management systems draw to improve teaching and learning in schools. A case study research design was used to evaluate the use of a formative feedback system in conjunction with a school reform initiative. The case study involved selection of four elementary schools with unique demographic populations. Results indicated use of a formative feedback system to monitor reform implementation stimulated data-driven instructional capacity in the schools. This approach facilitated analysis and linkage between signals, sensors, processors and actuators. Formative feedback provided by holistic systems data enhanced organizational capacity to develop and distribute information about reforms. As a result, sample schools were able to develop effective interventions and supports that produced high levels of fidelity. Halverson contended the findings offer rationale for a systems approach to collecting and using data. This supports the rationale of the present study to utilize multiple types of systems data in school improvement.

In a case study involving a group of schools in an unidentified school district, Collinson (2010) investigated outcomes associated with focusing on maintenance rather than OL. Maintenance is described as preserving the status quo. Collinson contended high performing schools often focus on maintenance and as a result do not develop the organizational capacity to respond flexibly to twenty-first century changes or close the gap with school systems experimenting with OL. Data collection involved observations of meetings, public forums, field notes, and interviews. The perceptions of school staff members were compared with individuals in systems demonstrating conditions supportive of OL. Collinson reported belief and behaviors of individuals in sample schools reflected narrow ideas of learning, suppression of inquiry, a culture of

dependency and distrust, and reaction instead of innovation. Maintenance of the status quo appeared to diminish the ability to create knowledge, innovate, detect and correct errors, receive feedback, or engender trust and transparency. Collinson suggested dependence on maintenance may contribute to performance discrepancy between schools with similar demographics. The findings provide relevancy and support for the theoretical foundation of the present study.

Bowen, Ware, Rose, and Powers (2007) conducted research to examine the reliability and validity of a tool for assessing schools as learning organizations. Data was collected from a population of 761 staff members from 11 middle schools in North Carolina. This involved administering a 36 item survey designed to measure 12 dimensions across two components of a learning organization: actions and sentiments. Over three quarters of the staff members surveyed had been employed at their respective schools for one year or more. Actions comprised the categories of team orientation, innovation, involvement, information flow, tolerance for error, and results orientation. Sentiments comprised the categories of common purpose, respect, cohesion, trust, mutual support, and optimism. Scores for actions and sentiments were developed for all cases complete on the survey by summing scores for appropriate items. Action and sentiment scores were correlated with school outcomes such as personal health, job satisfaction, self-efficacy, school performance and retention intention. Results indicated statistically significant positive relationships between the two learning organization dimensions and all school outcomes except personal health. Although statistically significant, Bowen et al. reported a weak correlation of .29 between school performance and actions as well as a weak correlation of .30 between school performance and sentiments. Low correlations

were partly attributed to low variability and high negative skewness in the dependent outcomes. The study provided empirical support for the theoretical construct of OL. It suggested OL can be measured and subsequently can also be developed by implementing specific tactics. This supports the methodology of the present study to identify OL practices in schools.

Mulford and Silins (2003) also utilized a correlational research design to investigate the relationship between OL and student outcomes. A four phase process was implemented to assess levels of OL and leadership characteristics in 96 secondary schools located throughout South Australia and Tasmania. The research design involved administration of a resurvey instrument to 3,500 students and 2,500 teachers. Mulford and Silins reported direct and indirect relationships between OL and a range of school variables. Teacher ratings of the school on four sequential dimensions defining OL positively correlated with student perception of teacher efforts. Positive perceptions of teacher effort directly correlated to participation in school, academic self-concept, and engagement. Pupil participation and engagement directly correlated with academic achievement. Mulford and Silins concluded student academic achievement was indirectly impacted by levels of OL. Despite efficacious findings, the report is limited by an absence of all direct correlation statistics. The findings supported the rationale for conducting additional studies seeking to further understanding of the relationship between OL and levels of student achievement.

Hofman, Dijkstra, Hofman (2009) provided insight regarding the relationship between school self-evaluation and student achievement. The study sample encompassed 939 Dutch primary schools demonstrating generalizability to the national population in

terms of academic achievement, student demographics, school enrollment, and degree of urbanization. School leaders in each sample school completed a questionnaire designed to evaluate dimensions of school self-evaluation. According to Hofman et al., self-evaluation is a practice rooted in OL theory and involves continuous internal assessment of school process. This requires analysis of school context, inputs, processes, and outputs. Data collection resulted in categorization of sample schools into four types of self-evaluation: hardly, moderate, advanced, and mixed. Hofman et al. indicated analysis of variance between the four types detected a statistically significant difference in levels of student math achievement. Statistical analysis revealed schools that implemented hardly any school self-evaluation practices produced math scores significantly lower than the other categories. This supports the intent of the present study to investigate OL practices that provide feedback on current school realities.

In a mix methods study on organizational conditions and practices, Anderson et al. (2010) reported on the relationship between systemic data use and student achievement in mathematics. This involved the use of a stratified random sample of approximately 180 elementary, middle, and high schools nested in 43 districts and nine states. Data collection involved surveys, interviews, and achievement data from state accountability tests. Initial data analysis supported identification of schools demonstrating characteristics of systemic data practices. According to Anderson et al., systemic data based decision making represents an interconnected framework comprised of process data, conditions influencing use of evidence, tactics for interpreting evidence, decisions and actions, and student learning. Data available to schools is often limited in breadth to the current status of student achievement and inhibits a comprehensive



understanding of school performance. Based on a regression analysis, systemic data use demonstrated a significant relationship with academic achievement, explaining 19% of the variance. Anderson et al. described the findings as weak statistical evidence of a positive relationship between student achievement and systemic data use. Qualitative results were combined with qualitative data to conclude there may be both a lower and an upper threshold beyond which increased systemic data use does not predict student achievement. Results provided additional support for a systems thinking approach to school improvement.

Demetriou and Kyriakides (2012) investigated the impact of three different approaches to school self-evaluation mechanisms on student achievement. Group randomization was used to create four groups from a sample of 60 primary schools in Cyprus. The groups demonstrated no statistically significant differences in terms of demographics and prior achievement levels in mathematics. In the first group, school stakeholders developed their own evaluation mechanisms and improvement strategies. The second group followed the identical process, however, initial training was provided on school self-evaluation. The third group was asked to develop mechanisms and decisions based on educational effectiveness research, with the final group serving as the control receiving no interventions. Data collection for correlational research design involved survey administration and standardized test results. All three experimental groups produced higher levels of mathematics achievement than the control group. Findings indicated the third group was the highest performing of all groups. According to Demetriou and Kyriakides, the essential difference of the approach employed with the third group was the use of a specific theoretical framework to guide mechanism

development. Schools in this group were required to consider not only priorities for improvement, but also evidence from educational effectiveness research. This supports the rationale of the present study to utilize research on effective schools to develop a systems perspective on acquiring school feedback.

### **Summary**

Conceptualization of the present study is based on the theoretical constructs of school improvement, OL, systems thinking, and models of effective schools. Each theoretical construct contributes rationale for organizational monitoring systems that measure attributes of effective schools. Interrelationships between theoretical constructs provides relevancy to the specific context of school organizations. A review of quantitative and qualitative empirical research related to OL offers additional insight to the development of the research questions and methodologies utilized for the present study. This involves a focus on implementation of organizational learning models and mechanisms. Associations are recognized between organizational monitoring systems and terms such as self-evaluation, self-assessment, and needs assessment. Despite numerous conceptions and promising empirical evidence, OL is rarely operationalized into structures and processes in school realities. OL is often considered ubiquitous and excessively broad, subsequently hindering the ability of schools to move from conceptual levels to actions and capability. Empirical literature is primarily comprised of studies investigating the general degree of OL rather than the efficacy of specific organizational learning mechanisms. This is demonstrated by limited research on the specific OL practice of using a monitoring system based on attributes of effective schools.

## **Chapter Three**

### **Research Methods**

The present study was intended to contribute knowledge on organizational learning (OL) practices in schools. Although empirical evidence on OL exists, few studies focus on monitoring systems in American public schools. This study specifically investigated the relationship between the use of organizational monitoring system practices and levels of student academic achievement.

Chapter Three details the methods, procedures, and components of statistical analysis utilized for the study. The specific procedures used in this study were conceptualized from prior studies that investigated organizational learning practices. The research design is outlined in the first section of the chapter. This includes a description of the setting where the study was conducted as well as participant schools, and the assignment methodologies for selection. In addition, predictor and criterion variables and the procedures for the study are explained. The second section of the chapter focuses on statistical analysis of data obtained from participant schools. This section outlines the instrument, data collection procedures, and data analysis that were based on participant responses and academic achievement results. The provision of information contained in this chapter is intended to provide context for the results delineated in Chapter Four.

### **Hypotheses of the Study**

Three research questions were utilized to guide the construction of the study. Investigation of the research questions involved the development of hypothesis statements. A null and alternative hypothesis statement were utilized for each research question. This resulted in the creation of the six hypothesis statements outlined below.

**Hypothesis (Null) 1.** There is no statistically significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's use of an annual staff survey that collects process data related to the occurrence of school attributes.

**Hypothesis (Alternative) 2.** There is a statistically significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's use of an annual staff survey that collects process data related to the occurrence of school attributes.

**Hypothesis (Null) 3.** There is no statistically significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan.

**Hypothesis (Alternative) 4.** There is a statistically significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan.

**Hypothesis (Null) 5.** There is no statistically significant relationship between improvements in reading and math proficiency rates on the Washington State

Measurement of Student Progress (MSP) in public middle schools and the school's implementation of comprehensive organizational monitoring.

**Hypothesis (Alternative) 6.** There is a statistically significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's implementation of comprehensive organizational monitoring.

### **Research Design**

This study utilized a correlational research design to investigate relationships between the use of organizational learning practices and student academic achievement. For the purpose of the study, the systematic use of multiple organizational monitoring system practices were utilized to represent the term comprehensive organizational monitoring. Provided the study does not seek to involve manipulation, use of a correlational design represents the most appropriate approach. With a focus on events that already occurred, the researcher selected relevant variables for an analysis of their relationship. This involved the identification of predictor and criterion variables. Although this type of research does not allow for causal claims, it offered the potential to understand the strength of relationships. This level of understanding informed the development of predictive statements about the variables.

**Setting.** The study was conducted in the State of Washington, which is located in the northwest corner of the United States. Washington serves 1,055,517 million students in 295 districts comprised of 2,305 schools (Office of Superintendent of Public Instruction, 2014). Student demographics are represented by a racial/ethnic population that is 58% White, 21.1% Hispanic, 8.1% Asian/Pacific Islander, 7.2% Asian, 6.8% two

or more races, 4.5% Black/African American, 1.6% American Indian/Alaskan Native, and 1.0% Native Hawaiian/Other Pacific Islander. Special program data indicates the population is identified as 45.9% free or reduced price meals, 13.2% special education, 9.7% transitional bilingual, 1.9% migrant, 2.4% section 504, and .7% foster care.

Educational services are provided by the employment of 51,676 classroom teachers funded by a \$9,694 per pupil expenditure ratio. This expenditure amount ranks Washington in the bottom 15% nationally. Primary funding is provided by state apportionments, along with supplemental revenue from local taxes and federal assistance. On average, state funds account for 64.6% of total revenue, local tax collection provide an additional 21.8%, and 12.8% comes from the federal government. State spending on the recent biennium budget totaled \$13.65 billion.

Academic achievement measured by Washington's standardized test in the 2013-2014 school year resulted in all assessment categories, but Grade 7 and Grade 8 math, exceeding a 60% threshold of students reaching a proficient score. The state's graduation rate for the 2013-2014 school year was 76% for adjusted four year completion. The Office of Superintendent of Public Instruction (OSPI) is the agency responsible for overseeing K-12 public education in the state. OSPI partners with nine educational service districts as well as local district school boards to implement policy, programs, and education reform.

**Sample.** Purposive sampling methodology was used to acquire a sample for the study. Provided the intent of the study to investigate relationships between organizational monitoring system practices and student academic achievement, selection criteria was constructed to incorporate complex school organizations. Rationale for selecting complex

school organizations was based on organizational learning theory suggesting the relevancy of organizational learning practices increase with levels of organizational complexity (Senge, 1990; Senge et al., 2000). School grade configuration was used as the first criteria for selection of complex school organizations. To address this criteria, middle schools configured with Grade 6, Grade 7, and Grade 8 were identified. This school grade configuration was recognized for complexity due to variables such as student developmental characteristics, grade configuration, curriculum, schedule structure, feeder patterns, instructional practices, and level transitions (ACT, 2009). The second criteria used to determine complexity for the study was school student enrollment. Selection for this criteria involved schools who met the first criteria, and reported 300 or more students enrolled during the 2013-2014 school year. Enrollment was used as a criteria for complexity due to the characteristics often associated with the number of individuals in the school community. School enrollment reflects the size of the student body as well as the number of staff assigned to the school and size of the parent community. This criteria aligns with assumptions about organizational size impacting levels of complexity (Senge, 1990).

Sampling methodology was projected to result in the selection of 200 middle schools. Through the use of the selection criteria all sample schools were structured with a Grade 6, Grade 7, and Grade 8 configuration and reported enrollment above 300 students. The sample was projected to represent a median school size of 650 students and a median free and reduced priced meals rate of 65 percent. Sample schools were projected to demonstrate a mean of 60 certificated staff members and 1.5 administrators. Projected demographic means of student racial/ethnic identification were 58% White,

21.1% Hispanic, 8.1% Asian/Pacific Islander, 7.2% Asian, 6.8% two or more races, 4.5% Black/African American, 1.6% American Indian/Alaskan Native, and 1.0% Native Hawaiian/Other Pacific Islander. The projected median for the sample on the 2013-2014 state assessment was 60% of students meeting standard in math and 70% of students meeting standard in reading. Sample demographics were projected to demonstrate generalizability to the study population. Comparison of sample and population demographics were projected to reveal all data points within a 3% differential range.

**Variables.** Three predictor variables and one criterion variable were used for this study. The first predictor variable was school use of an annual staff survey that collects process data related to the occurrence of school attributes. For this variable, Leithwood et al.'s (2006) model of effective schools served as the criteria for supporting attribute identification. The second predictor variable was school use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan. The third predictor variable was school implementation of comprehensive organizational monitoring. The criterion variable was a composite score comprised of changes in the percentage of students who met standard in reading and math on the state standardized test between the 2012-2013 and 2013-2014 school year. The study also incorporated a confounding variable in the form of school free and reduced priced meals rate.

**Definitions of key terminology.** A number of terms were consistently utilized to articulate the theoretical foundations and methodologies of the study. Terms essential to the comprehension of the research procedures are outlined below.



1. *Comprehensive Organizational Monitoring* – the systematic use of multiple organizational monitoring practices
2. *Process Data* – data indicating the degree to which a specific attribute of the organization exists.
3. *Staff Perceptual Survey* – a survey instrument administered to certificated and classified staff members designed to measure perceptions of school attributes.
4. *Survey Administration* – the delivery and subsequent completion of a survey instrument by certificated and classified staff members.
5. *Effective Schools Research* – the body of literature outlining school-based factors empirically identified as value-added contributors to student academic achievement.
6. *Attribute of Effective Schools* – a school-based factor empirically identified as a value-added contributor to student academic achievement.

**Procedures.** To investigate the research questions four phases of data collection were utilized. The first phase was administration of a research survey instrument to all sample school principals (Appendix A). Principals were selected to complete the survey based on the assumption individuals in this role are most likely to have the information required to answer the survey questions with validity. As a result, electronic mail addresses of school principals were acquired and used to deliver the survey instrument. The survey instrument was developed on a web-based platform made accessible in the text of the electronic mail sent to principals. An electronic format was used to enhance efficiency in delivery and data collection. Principals were provided an introduction to the study and solicited for participation. This included explanation of confidentiality parameters and researcher contact information. Directions established a four week

window for participants to complete the survey. At the mid-point of the window all participants received a reminder regarding the survey deadline.

The second phase of data collection was retrieval of school survey instruments and historical survey data retained by the school. Based on the research survey instrument administered to principals, schools indicating the use of a survey to monitor one or more school attributes were solicited for the instrument and data from the 2012-2013 to 2013-2014 school year. Two weeks after the conclusion of phase one, principals were contacted by the researcher. Information was provided regarding confidentiality parameters and how data collected from phase two was intended to be incorporated into the findings of the study. Principals were offered the option of providing the survey instrument and historical data in electronic or hard copy format.

The third phase of data collection was retrieval of standardized test results in reading and math for all sample schools from the 2012-2013 to 2013-2014 school year. This involved the identification of the Measurement of Student Progress (MSP) as the mandated standardized assessment in Washington State. Middle schools in Washington State administer the MSP in reading and math to Grade 6, Grade 7, and Grade 8 students each spring. Schools submit the assessment to the Office of Superintendent of Public Instruction (OSPI) for scoring and reporting purposes. To collect data for phase three, performance results were downloaded from the OSPI website. Official data reports contained frequency distributions of performance levels and proficiency percentages disaggregated by content area and grade level.

The fourth phase of data collection was the retrieval of free and reduced priced meals rate. This involved recording the percentage of students at each school in the free

and reduced priced meals program. To collect data for phase four, demographic information was downloaded from the OSPI website.

**Measures.** The research survey instrument intended utilized in phase one of data collection was developed by the researcher and incorporated a total of 15 items (Appendix A). Survey items were designed to collect demographic information and perceptual data related to the research questions. Demographic items include: school name, principal name, tenure of principal, and number of staff members. Perceptual survey items were based on Leithwood et al.'s (2006) model for comprehensive organizational monitoring. Items were designed to assess school use of specific organizational monitoring practices as well as the overall fidelity of comprehensive organizational monitoring. Respondents were requested to indicate school use of an annual staff survey, school use of an annual staff survey that collects process data related to the occurrence of school attributes, and school use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan. This included follow-up questions regarding administration, tracking, and analysis of collected data. Respondents indicating the use of a staff survey were also prompted to identify which attributes(s) the survey was intended to measure, how many years it was administered, and if data from staff surveys were retained by the school. Items were constructed in multiple choice format. The survey included a set of directions for respondents and key definitions of item terminology. Directions outlined the survey format, question types, and response requirements. A list of example attributes and related attributes were provided in the directions section to provide context for respondents. To develop validity and reliability of the instrument a pilot process was

completed. The pilot process involved administering the research survey to a group of principals in a large urban school district. Pilot participants were solicited for feedback on item format and clarity. A statistical analysis of the pilot process is described in the subsequent section of the chapter.

Research survey data was used to categorize sample schools and assign an overall scale score to each school indicating levels of comprehensive organizational monitoring. Categorization involved identifying schools who administer an annual staff survey that collects process data related to the occurrence of school attributes and schools who use data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan. Schools who responded yes on all survey items intended to verify the administration of a staff survey were categorized as using a staff survey. Schools who do not meet the categorization criteria were categorized as not using a staff survey. Schools who respond yes on all survey items intended to verify the use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan were categorized as using process data in school improvement planning. Schools who did not meet the categorization criteria were categorized as not using process data in school improvement planning.

In addition to sample school categorization, research survey data was utilized to develop a survey scale score indicating levels of comprehensive organizational monitoring. Perceptual survey items were each assigned a point value in order to construct an overall scale score. Survey items constructed with two response options were allocated a one point value. Items were assigned one point for a yes response and

zero points for a no response. The survey item constructed to measure the number of years a school had administered an annual staff survey that collects process data related to the occurrence of school attributes was allocated one point value for each year indicated. A maximum of four points was assigned to this survey item. The survey item constructed to measure which attributes school surveys were designed to collect data on was allocated one point value for each attributed identified. A maximum of eight points was assigned to this survey item.

Measurement for phase two of data collection was intended to represent a mix qualitative and quantitative process. Survey instruments from schools who indicated the use of an annual staff survey that collects process data related to the occurrence of school attributes were solicited to provide school surveys and historical data. Survey items were categorized into one of Leithwood et al.'s (2006) eight attributes to determine if schools accurately indicated on the researcher developed survey the attributes measured on the school survey. Verification of an attribute on a school survey required attribute alignment with at least one survey item. The qualitative process used to review school surveys involved quantitatively calculating the percentage of attributes schools accurately identified on the research survey. This involved assigning a mean accuracy percentage to the sample group. Implementation of a qualitative process to review school surveys was intended to validate respondent identification of survey use in phase one of data collection and provide further insight on the composition of school survey instruments. Historical data was intended to be evaluated to determine if schools who use organizational monitoring system practices improve the occurrence of desired school attributes.

Measurement for phase three data collection was ex post facto retrieval of MSP results in reading and math. Starting in the 2009-2010 school year, Washington State utilized the MSP to fulfill federal and state assessment mandates. The MSP was replaced at the end of the 2013-2014 school year with the Smarter Balanced Assessment in order to offer an assessment aligned to the Common Core Standards. During the implementation period, MSP administration served as the primary measure of student performance on Washington State Learning Standards in reading, math, writing, and science. The MSP items included multiple-choice and short-answer questions. Schools utilized a paper-pencil or online format and were required to submit assessments to OSPI in the parameters of a spring testing window. Student performance was reported using a scale score. Scale scores were three digit values used to categorize students into one of four levels of performance: Advanced, Proficient, Basic, Below Basic. A one-point value was assigned to multiple choice items and a two-point value was assigned to short answer items. A scale score of 400 was needed to meet standard on the assessment, requiring students to answer approximately 60 percent to 65 percent of the test items correctly. Students achieving the advanced or proficient level were identified as meeting standard. The number of students meeting standard was used to calculate a percent meeting standard statistic for each school in reading, math, writing, and science. For the purpose of the study, the percent meeting standard statistic in reading and math was used to develop a composite score representing the criterion variable (Linn, 2003).

Measurement for phase four data collection was ex post facto retrieval of free and reduced priced meals percentage. The provision of free and reduced priced meals is a product of The National School Lunch Program (Office of Superintendent of Public

Instruction, 2014). Students are determined eligible for free or reduced priced meals based on demographic factors such as income level and household size. The Food and Nutrition Service administers the program at the federal level. On the state level, the National School Lunch Program is usually administered by state education agencies, which operates the program through agreements with local school districts. The percentage of students participating in the free and reduced priced meals program represents a conventional method for assessing school poverty rates. This percentage was used to represent a confounding variable for the study.

### **Statistical Analysis**

Data was collected in the spring of 2015 and entered into SPSS version 22.0. As the goal of the present study was to determine the relationship between predictor and criterion variables, an analysis to conduct such an investigation was employed. Due to the utilization of a researcher-constructed instrument to obtain data, an analysis of the instrument's validity and reliability was also conducted.

**Instrumentation.** The instrument used in this study was a researcher designed survey. Survey items were designed to measure three phenomena. The first phenomena, which aligns with the first research question, was school use of an annual staff survey that collects process data related to the occurrence of school attributes. The second phenomena, which aligns with the second research question, was school use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan. The third phenomena, which aligns with the third research questions, was school implementation of comprehensive organizational monitoring. Instrument items consisted of 15 multiple choice items collecting

demographic and perception data. Item construction involved four demographic items and 11 respondent perception items. Multiple choice items ranged from two to eight response options.

The content of survey items were aligned with the research questions of the study and Leithwood et al.'s (2006) model for comprehensive organizational monitoring. In order to ensure content and face validity, the final instrument was created in consultation with a team of middle school principals and an outside expert in organizational learning. Consultation included input on item terminology, item clarity, survey format, and research question alignment. A specific emphasis of input solicitation focused on alignment between survey terminology and terminology used in the field. Input on the definition of key terminology contributed to the development of survey directions. After initial development, the survey instrument was piloted with a group of middle school principals. Pilot participants were solicited to complete the survey items and provide qualitative feedback. The pilot phase was projected to result in modification to several survey item due to potential concerns regarding item clarity.

Due to the researcher developed nature of the instrument, reliability was calculated on multiple choice items in order to enhance the creditability of the study results. Specifically, reliability of multiple choice items designed to collect perception data was calculated. Split-half reliability was utilized to ensure surveys items demonstrated reliability in measuring organizational learning practices. The internal consistency estimates of reliability was analyzed using the split-half coefficient, which was computed using SPSS 22.0. Split-half scores above .70 suggest identified survey



items measured the same concept (Field, 2009). The researcher developed instrument was projected to produce a split-half coefficient of .90, indicating satisfactory reliability.

**Data analysis.** Initial statistical analysis started with categorization of sample schools. This categorization process was utilized to differentiate schools for the two dichotomous predictor variables of the study. Analysis of demographic and perception data was used to categorize schools based on criteria designed to identify school use of an annual staff survey that collects process data related to the occurrence of school attributes and school use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan. Sample schools who responded yes to both survey items intended to verify school use of an annual staff survey that collects process data related to the occurrence of school attributes were categorized as using a staff survey. Sample schools who did not meet the category criteria were categorized as not using a staff survey. Sample schools who responded yes to both survey items intended to verify school use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan were categorized as using process data in school improvement development. Sample schools who did not meet the category criteria were categorized as not using process data in school improvement development. The categorization process and criteria enabled multiple variations as schools were identified as administering a staff survey, but were not using the data in school improvement plan development. Categorization based on the research question regarding school use of an annual staff survey that collects process data related to the occurrence of school attributes was projected to result in 50 sample schools assigned to the using a staff survey category, and 50 sample schools assigned to the not

using a staff survey category. Categorization based on the research question regarding school use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan was projected to result in 50 sample schools assigned to the using process data in school improvement development category, and 50 schools assigned to the not using process data in school improvement plan development category.

Initial statistical analysis also involved the development of a survey scale score indicating levels of comprehensive organizational monitoring. Point values were assigned to each perceptual survey item in order to construct an overall scale score. Survey items constructed with two response options were allocated a one point value. The survey item constructed to measure the number of years a school has administered an annual staff survey that collects process data related to the occurrence of school attributes was allocated one point value for each year indicated. The survey item constructed to measure which attributes school surveys were designed to collect data on was allocated one point value for each attributed identified. The total of all survey item scores was utilized to represent the survey scale score for each school. This statistical process resulted in scale scores ranging from 1 to 21 points.

To prepare for inferential statistical analysis, criterion variable data consisting of reading and math MSP scores were transformed into composite scores (Linn, 2003). Each sample school's MSP data was utilized to create a composite score to represent the school in the criterion variable data set. The composite score was comprised of the change in the percentage of students proficient in reading and math between the 2012-2013 and 2013-2014 school years. Scores were examined to determine the change in percentage of

proficient students from Grade 6 to Grade 7 and from Grade 7 to Grade 8. This resulted in the development of a two digit composite score for each school signifying the total numerical change in the percentage of proficient students in reading and math for two groups of students. For the purpose of inferential statistical analysis, the criterion variable was represented by each sample school's singular composite score.

The final component of initial statistical analysis involved descriptive statistics related to the research survey item soliciting respondents to indicate which attributes of effective schools were measured by staff surveys. Frequency counts were generated to identify the most commonly measured attributes. This analysis served to reinforce the qualitative analysis conducted on school survey instruments.

The present study utilized a correlational design, which warranted computation of descriptive and inferential statistics to address the research questions. Descriptive statistics included means, standard deviations, and skewness and kurtosis statistics for the variables. Preliminary analysis of descriptive statistics were used to evaluate the assumptions of parametric statistics. Inferential statistics were conducted to determine the relationship between the predictor variables and criterion variable. This involved identification of test significance at the  $p < .05$  level, as educational conventions were followed to evaluate degrees of practical significance (Field, 2009).

Each research hypothesis were tested using a bivariate correlational analysis. Each predictor variable data set was correlated with the criterion variable data set, resulting in the use of correlational coefficients to evaluate the relationship between variables (Gall, Gall, & Borg, 2003). A point-serial  $r$  statistic was used to investigate dichotomous predictor variable data sets and pearson  $r$  statistic for the continuous

predicator variable set (Vogt & Johnson, 2011). Educational convention were used to establish an alpha level of .05 to determine statistical significance (Field, 2009). Practical significance of correlational coefficients involved computation of the  $r^2$  effect size statistic. The effect size statistic was utilized to determine the amount of variance accounted for by each predictor variable in criterion variable scores.

In addition to bivariate correlational analysis between individual predictor variables and the criterion variable, the final stage of statistical analysis involved a multivariate correlation. Predictor variables were collectively evaluated with the criterion variable using a multiple regression analysis (Gall et al., 2003). The predictor variable of implementing an annual staff survey and predictor variable of implementing process data in school improvement plan development were correlated collectively with the criterion variable to determine unique variance levels. A multiple regression analysis was also used to evaluate the predictor variable of comprehensive organizational monitoring and predictor variable of school free and reduced meals rate collectively with the criterion variable to determine unique variance levels. The multiple regressions were conducted with a hierarchical method to accommodate the characteristics of the predictor variables (Field, 2009). This resulted in the use of the regression R statistic to determine statistical significance of the relationships between the variables. The establishment of an alpha level of .05 was used for this analysis. Practical significant was evaluated with the use of the  $R^2$  and  $R^2$  Change statistic computed during the process of entering predictor variables into the regression model.

**Qualitative analysis.** A qualitative analysis was used to support the validity of the study findings, provide further insight on the composition of school research

instruments, and investigate changes in survey data over time. This involved soliciting schools from the original sample group who indicated the use of a staff survey for the survey instrument and historical data. School surveys were compared to Leithwood et al.'s (2006) effective schools model that was used to list attributes on the researcher developed survey instrument. Survey items were categorized into one of Leithwood et al.'s eight attributes to determine if schools accurately indicated on the researcher survey the attributes measured on the school survey. Verification of an attribute on a school survey required attribute alignment with at least one survey item. The qualitative process used to review school surveys involved quantitatively calculating the percentage of attributes schools accurately identified on the research survey. In addition, school surveys were reviewed to provide insight on survey composition and attribute identification tendencies of respondents. School surveys were also intended to be evaluated to assess changes in results over time. The research design incorporated analysis of individual school survey results for each implementation year were compared to determine if respondent scores increased. These qualitative analyses were utilized to enhance the validity of identifying school use of an annual staff survey that collects process data related to the occurrence of school attributes.

### **Summary**

The present study was intended to offer insight regarding the impact of OL practices in schools. A correlational research design was utilized to investigate the relationship between the use of organizational monitoring system practices and student academic achievement. Purposive sampling was projected to result in the selection of 200 sample schools for the study. This involved researcher determined criteria developed to

identify schools functioning in a complex organizational environment. Three predictor variables and one criterion variable served as the basis for data collection and statistical analysis. The first predictor variable was school use of an annual staff survey that collects process data related to the occurrence of school attributes. The second predictor variable was school use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan. The third predictor variable was school implementation of comprehensive organizational monitoring. A composite score comprised of changes in the percentage of students who met standard in reading and math on the state standardized test between the 2012-2013 and 2013-2014 school year served as the criterion variable. Data collection involved the administration of a researcher developed survey to sample school principals, analysis of school surveys, and retrieval of standardized test results and demographic information. Effort was made to enhance the validity and reliability of the survey instrument through the use of a pilot process and statistical analysis. Research survey results were utilized to categorize sample schools and to develop a scale score indicating levels of comprehensive organizational monitoring. Statistical analysis involved evaluation of parametric assumptions and subsequent computation of bivariate correlation statistics and multivariate multiple regression statistics. A qualitative analysis was also conducted on individual school surveys to verify the validity of quantitative data. Chapter Four presents the results of this study.

## Chapter Four

### Results

This study examined organizational learning practices and levels of student academic achievement. A correlational research design investigated the relationship between the collection and use of process data related to school attributes and a composite score comprised of changes in the percentage of students proficient in reading and math.

Three predictor variables and one criterion variable were used for this study. The first predictor variable was school use of an annual staff survey that collects process data related to the occurrence of school attributes. For this variable, Leithwood et al.'s (2006) model of effective schools served as the criteria for supporting attribute identification. The second predictor variable was school use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan (SIP). The third predictor variable was school implementation of comprehensive organizational monitoring. The criterion variable was a composite score comprised of changes in the percentage of students who met standard in reading and math on the state standardized test between the 2012-2013 and 2013-2014 school year. A confounding variable in the form of school free and reduced priced meals rate was also utilized.

The study results encompass both quantitative and qualitative analysis. Data collection involved the administration of a researcher designed survey to sample schools, retrieval of school surveys and historical data, and collection of standardized tests scores. This chapter provides a description of sample schools and outlines the quantitative statistical analysis and interpretation of data generated by the data collection process. The

results of the study are evaluated to address each research question and subsequent hypothesis statements. This chapter concludes with the reporting of results from the qualitative analysis that was conducted to support quantitative findings.

### **Sample Information**

Chapter Three presented a review of the school population from which the sample for this study was obtained. The following information serves to provide a description of the sample in order to outline context for interpreting the study results. Purposive sampling methodology based on researcher determined criteria produced a list of 180 middle schools. Due to a number of schools field testing the new state assessment system, 84 schools were excluded because standardized achievement scores were not reported for the 2013-2014 school year. Survey administration to the principals of the remaining 96 schools concluded with 57 respondents completing all survey items, which represented a 59% survey return rate. Preliminary review of respondent schools revealed 10 schools with suppressed standardized achievement scores and as a result these schools were removed from the sample group. In addition, initial data analysis revealed the presence of several school outliers in the criterion variable data set. To enhance normality four outlier schools were excluded from the study. The 43 remaining respondents provided the final group of sample schools used for quantitative and qualitative analysis. This produced a sample group school enrollment mean of 775 students. School racial/ethnic demographic means of the sample group were .9% American Indian/Alaskan Native, 8.7% Asian, 1.5% Native Hawaiian/Other Pacific Islander, 10% Asian/Pacific Islander, 5.3% Black/African American, 24.2 Hispanic, 53.2 White, 6.3 Two or More Races. Special program demographic means included 48.1% free or reduced price meals, 12.5 special



education, 7.5% transitional bilingual, 2% migrant, 2.5% section 504, .5% foster care. Independent *T* Tests were conducted to evaluate demographic differences between the sample group and population of middle schools with Grade 6, Grade 7, and Grade 8 configurations in the State of Washington. This analysis detected a statistically significance difference,  $t(295) = 2.07, p < .05$ , in the demographic category of Asian/Pacific Islander. The detection of a singular category of statistically significance difference offers insight on the high generalizability of the sample group. Generalizability is used to evaluate the relevance of the study findings discussed in Chapter Five. Table 1 outlines a review of the demographic means for the sample group and population.

Table 1

*Demographic Category Means*

	Sample	Population
American Indian/Alaskan Native	.9	2.0
Asian	8.7	6.1
Native Hawaiian/Other Pacific Islander	1.5	.8
Asian/Pacific Islander	10.0	6.9
Black/African American	5.3	3.6
Hispanic	24.2	19.9
White	53.2	54.3
Two or More Races	6.3	5.3
Free or Reduced Priced Meals	48.1	44.2
Special Education	12.5	11.6
Transitional Bilingual	7.5	6.0

Migrant	2.0	2.3
Section 504	2.5	2.6
Foster Care	.5	.5

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### **Quantitative Analysis**

**Survey instrument.** The quantitative analysis of the study involved data from a researcher developed survey instrument and composite scores comprised of changes in the percentage of students proficient in reading and math. A pilot process was conducted with the researcher developed survey to enhance levels of content validity. Participants of the pilot included a group of middle school principals from urban, suburban, and rural school districts. Initial pilot participant feedback identified the necessity to modify the word usage for several of the survey items. These items were described as unclear or excessively broad in nature. Follow-up communication verified acceptable content validity in the survey measurement of practices related to the collection and use of process data based on school attributes. Survey items were reviewed with pilot participants to ensure item content construction accurately measured school practices. In addition to content validity, perceptual survey items were evaluated for reliability. The internal consistency estimates of reliability were analyzed using the split-half coefficient Cronbach's alpha. Split-half scores above .70 suggest identified survey items measured the same construct (Field, 2009). The reliability analysis conducted on the researcher developed survey instrument revealed perceptual survey items demonstrated a Cronbach's  $\alpha = .75$ , indicating satisfactory reliability.

**Predictor variable coding.** Research survey results were used to categorize schools for two of the predictor variables. Analysis of perceptual survey response data served to identify school use of an annual staff survey that collects process data related to the occurrence of school attributes and school use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan. Sample schools who responded yes to both survey items intended to verify the administration of a staff survey were categorized as implementing a staff survey. This resulted in 37 schools assigned to the implementing staff survey category and six schools assigned to the not implementing staff survey category. Samples schools who responded yes to both survey items intended to verify the use of process data related to school attributes in school improvement plan developed were categorized as implementing process data in school improvement plan development. This resulted in 29 schools assigned to the implementing process data in school improvement plan development category and 14 schools assigned to the not implementing process data in school improvement plan development category. Table 2 outlines the frequency statistics for each category. This coding process produced two dichotomous predictor variables to utilize for correlational analysis with the criterion variable.

Table 2

*Category Frequencies*

	Implementing	Not Implementing
Staff survey administration	37	6
Process data in SIP Development	29	14

**Survey scale score construction.** A survey scale score indicating levels of comprehensive organizational monitoring was calculated from responses on perceptual survey items. A point value was assigned to each survey item in order to construct an overall scale score. Survey items constructed with two response options were allocated a one point value. Items were assigned one point for a yes response and zero points for a no response. The survey item constructed to measure the number of years a school had administered an annual staff survey that collects process data related to the occurrence of school attributes was allocated one point value for each year indicated. A maximum of four points was assigned to this survey item. The survey item constructed to measure which attributes school surveys were designed to collect data on was allocated one point value for each attributed identified. A maximum of eight points was assigned to this survey item. This computation process produced a continuous predictor variable to utilize for correlational analysis with the criterion variable. Table 3 displays the mean and standard deviation for the survey scale score data set.

Table 3

*Survey Scale Score*

	Mean	<i>SD</i>
Survey Scale Score	14.4	5.8

**Descriptive statistics.** Evaluation of parametric assumptions for inferential statistics were supported by the analysis of descriptive statistics for levels of normality. Due to the dichotomous nature created by coding schools into two categories for the predictor variable of implementing an annual staff survey and the predictor variable of

implementing process data in school improvement plan development, levels of normality were not assessed. Constructing predictor variables in this manner represents an exception to the common reliance on normality needed to conduct correlational analysis. As a result, the two dichotomous predictor variables were investigated using a biserial correlation, which permits the correlation between a dichotomous predictor variable and continuous criterion variable. The predictor variable of comprehensive organizational monitoring measured by the research survey scale score was investigated for normality. Descriptive statistics indicated a mean of 14.4 and standard deviation of 5.8 for this continuous data set. Normality levels were represented by a -1.1 skewness statistic and .3 kurtosis statistic, which were both determined to be in adequate proximity to the  $\pm 1$  recommended range. Acceptable normality was further verified by visual interpretation of the data set on a histogram graph. The predictor variable represented by school free and reduced priced meals rate demonstrated acceptable normality. Descriptive statistics indicated a mean of 48.1 and standard deviation of 25.0 for data set. Normality levels were both within the recommended  $\pm 1$  range with a .1 skewness statistics and -.9 kurtosis statistic. Visual interpretation of the data on a histogram graph verified the determination of normality. The criterion variable comprised of composite scores based on changes in the percentage of students proficient in reading and math was also investigated for normality. Descriptive statistics indicated a mean of -5.3 and standard deviation of 12.3 for this continuous data set. Normality levels were represented by a -.5 skewness statistic and 2.0 kurtosis statistic. Although the kurtosis statistics was outside of the  $\pm 1$  recommended range, the overall level of normality was determined to be adequate. Visual interpretation of the data on a histogram graph was used to accept the normality level

despite concern with the kurtosis statistic. This decision was impacted by the exclusion of five school outliers during the initial data review process.

Descriptive statistics were also calculated in the form of frequency counts to assess the research survey item soliciting respondents to indicate which school attributes were measured by staff surveys. Frequency counts were generated to identify the most commonly measured attributes. This analysis served to reinforce the qualitative analysis conducted on school survey instruments. Tables 4 provides a review of the frequency counts for each attribute identified on the survey.

Table 4

*Attribute Frequency Counts*

Attribute	Frequency
Leadership and Management	38
Mission and Goals	29
Culture and Community	40
Planning and Instructional Services	31
Structure and Organization	23
Data Driven	27
Policies and Procedures	18
Community Partnerships	21

**Correlational analysis.** The two dichotomous predictor variables and criterion variable were investigated using a biserial correlation analysis. A statistically significant moderate positive relationship was detected between the predictor variable of

implementing an annual staff survey and the criterion variable,  $r_b = .52$ ,  $p < .05$ . Practical significance was demonstrated by  $r^2 = .27$ , indicating an effect size of 27% of the variance in the criterion variable accounted for by the predictor variable. Visual display of the relationship on a scatterplot confirmed acceptable homoscedasticity and linearity levels. This outcome addressed the first research question: Is there a significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's use of an annual staff survey that collects process data related to the occurrence of school attributes? The detection of a statistically significant relationship supports the rejection of the null hypothesis based on the first research question.

A statistically significant weak positive relationship was also detected between the predictor variable of implementing process data in school improvement plan development and the criterion variable,  $r_b = .37$ ,  $p < .05$ . Practical significance was demonstrated by  $r^2 = .14$ , indicating an effect size of 14% of the variance in the criterion variable accounted for by the predictor variable. Visual display of the relationship on a scatterplot confirmed acceptable homoscedasticity and linearity levels. This outcome addressed the second research question: Is there a significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan? The detection of a statistically significant relationship supports the rejection of the null hypothesis based on the second research question. Table 5 provides an outline of the relationships between the variables. .

Table 5

*Biserial Correlational Analysis*

Variable	1	2	3
1. Survey	-		
2. Process Data SIP	.58	-	
3. Composite Score	.52	.37	-

The predictor variable of comprehensive organizational monitoring and the criterion variable were investigated using a Pearson correlation analysis due to the continuous nature of both data sets. This resulted in the detection of a statistically significant moderate positive relationship between the predictor and criterion variable,  $r = .55$ ,  $p < .05$ . Practical significance was demonstrated by  $r^2 = .30$ , indicating an effect size of 30% of the variance in the criterion variable accounted for by the predictor variable. Visual display of the relationship on a scatterplot confirmed acceptable homoscedasticity and linearity levels. This outcome addressed the third research question: Is there a significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's implementation of comprehensive organizational monitoring? The detection of a statistically significant relationship supports the rejection of the null hypothesis based on the third research question.

**Multiple regression analysis.** The predictor variable of implementing an annual staff survey and predictor variable of implementing process data in school improvement plan development were correlated collectively with the criterion variable to determine



unique variance levels. A multiple regression analysis utilizing a hierarchical model was used to enter the implementing an annual staff survey variable followed by the implementing process data in school improvement plan development variable. The initial model entry detected a statistically significant moderate positive relationship between implementing an annual staff survey and the criterion variable,  $R = .52$ ,  $p < .05$ , indicating the predictor variable accounts for 27% of the variance,  $R^2 = .27$ . Entry of the implementing process data in school improvement development variable into the model also resulted in a statistically significant moderate positive relationship,  $R = .52$ ,  $p < .05$ , however, the  $R$  square change value was not found to be statistically significant,  $\Delta R^2 = .00$ . The addition of the implementing process data in school improvement develop variable did not account for a statistically significant amount of unique variance in the criterion variable,  $\beta = .11$ ,  $t(40) = .67$ ,  $p > .05$ , when examined collectively with the implementing an annual staff survey variable. Table 6 demonstrates the multiple regression analysis for each hierarchical model entry. These findings inform the practical significance of statistically significant findings regarding the relationship between the predictor variable of implementing an annual staff survey and criterion variable, and the relationship between the predictor variable of implementing process data in school improvement plan development and criterion variable.

Table 6

*Multiple Regression: Predicting Criterion Variable From Staff Survey Implementation and Process Data In School Improvement Plan Development*

Predictor	$R$	$\Delta R^2$	$\beta$
Step 1	.52	.27	

Staff Survey Implementation			.52
Step 2	.52	.0	
Staff Survey Implementation			.45
Process Data School Improvement			.11

A multiple regression analysis was also used to evaluate the predictor variable of comprehensive organizational monitoring and predictor variable of school free and reduced priced meals rate collectively with the criterion variable to determine unique variance levels. To conduct the analysis a hierarchical model was used to enter the free and reduced priced meals rate variable followed by the implementing comprehensive organizational monitoring variable. The initial model entry did not detect a statistically significant relationship between school free and reduced price meals rate and the criterion variable,  $R = .06$ ,  $p > .05$ , indicating the predictor variable accounted for an extremely small amount of variance. Entry of the comprehensive organizational monitoring variable into the model produced a statistically significant moderate positive relationship,  $R = .58$ ,  $p < .05$ , as evidence by the detection of a statistically significance  $R$  square change value,  $\Delta R^2 = .33$ . The addition of the comprehensive organizational monitoring variable accounted for a statistically significant amount of unique variance in the criterion variable,  $\beta = .59$ ,  $t(40) = 4.5$ ,  $p < .05$ , when examined collectively with the free and reduced priced meals rate variable. These findings inform the practical significance and generalizability of comprehensive organizational monitoring in the context of school free and reduced priced meals rate. Table 7 outlines the multiple regression analysis for each hierarchical model entry.

Table 7

*Multiple Regression: Predicting Criterion Variable From Free Reduced Priced Meals Rate and Comprehensive Organizational Monitoring*

Predictor	<i>R</i>	$\Delta R^2$	$\beta$
Step 1	.06	.0	
Free and Reduced Priced Meals Rate			-.06
Step 2	.58	.33	
Free and Reduced Priced Meals Rate			-.19
Comprehensive Organizational Monitoring			.59

### **Qualitative Analysis**

A qualitative analysis was used to support the validity of the study findings and provide further insight on the composition of school research instruments. This involved soliciting schools from the original sample group who indicated the use of a staff survey for their survey instrument and historical data. School surveys were compared to Leithwood et al.'s (2006) effective schools model that was used to list attributes on the researcher developed survey instrument. Survey items were categorized into one of Leithwood et al.'s eight attributes to determine if schools accurately indicated on the researcher survey the attributes measured on the school survey. Verification of an attribute on a school survey required attribute alignment with at least one survey item. The qualitative process used to review school surveys involved quantitatively calculating the percentage of attributes schools accurately identified on the research survey. School surveys were returned by 14 respondent schools for analysis. Analysis indicated a 70%

mean accuracy rate in the identification of attributes measured by school surveys. The evaluation of historical school survey data to determine changes in results over time was not conducted due to the inability to acquire desired data. Respondents articulated confidentiality concerns and district policy as rationale for declining the data request.

The low number of responses to the school survey request and inability to evaluate historical data represented inhibiting factors to the qualitative phase of the study. Despite these limitations, review of school surveys provided insight into survey composition and attribute identification tendencies of respondents. The majority of school surveys utilized survey items constructed in multiple choice format. This typically involved the use of a Likert scale to indicate levels of agreement with survey item statements. Several school surveys provided a list of broad statements and requested comments in a narrative format. These school indicated on the research survey that eight attributes were measured by the items, however, qualitative review revealed the provision of broad statements likely does not reflect intentional monitoring of specific attributes. Comparison of school surveys and indication of measured attributes on the research survey also revealed respondent identification error was due to under identification of attributes rather than over identification. This finding suggests a tendency may exist to inaccurately perceive the capability of school surveys to measure specific attributes.

### **Summary**

This chapter provided a description of the analysis and interpretation of quantitative and qualitative data collected during the study. Sample group information was outlined and compared to the study population to provide context and inform generalizability of study results. The research survey pilot process was described as well

as the outcome of data coding for dichotomous predictor variables. Descriptive statistics were then reviewed to confirm the assumptions of parametric assumptions for each variable data set. Quantitative statistical analysis indicted the existence of individual statistically significant relationships between all predictor variables and the criterion variable. A weak statistically significant relationship was detected between the predictor variable of implementing a staff survey and the criterion variable, and between the predictor of implementing process data in school improvement plan development and the criterion variable. A moderate statistically significant relationship was detected between the predictor variable of implementing comprehensive organizational monitoring and the criterion variable. These findings resulted in the rejection of the null hypothesis for each of three research questions.

Multiple regression analysis was also utilized to inform practical significant and levels of generalizability. Findings indicated that when examined collectively with the predictor variable of implementing a staff survey, the predictor variable of implementing process data in school improvement plan development does not account for a statistically significant level of unique variance. Findings of a multiple regression analysis also indicated that free and reduced priced meals rate did not account for a statistically significant level of unique variance when evaluated collectively with the predictor variable of comprehensive organizational monitoring.

Qualitative analysis involved soliciting original respondent schools for their school surveys and historical data. Despite a low return rate of school surveys and inability to acquire historical data, qualitative analysis indicated a 70% mean accuracy rate in the identification of attributes measured by school surveys. Qualitative analysis

also revealed insight into the composition of school surveys and that tendencies may exist to inaccurately perceive the capability of school surveys to measure specific attributes. Chapter Five focuses on the discussion of these findings, their relevance, and the practical significance of the results to practitioners in the field.

## **Chapter Five**

### **Discussion of Results**

The educational system is currently structured to focus on standardized tests result to inform school improvement plan (SIP) development. This phenomena generates concerns regarding the methodology utilized to determine actions intended to improve levels of student achievement. Some educational experts suggest many schools rely solely on tests results to develop SIPs. Subsequently, reforms often address symptomatic issues rather than foundational problems. As a result, schools fall into a cycle of adopting new initiatives year after year that do not produce sustainable improvements. The concept of becoming a learning organization by using a monitoring system to inform systems thinking represents as an alternative approach to school reform. Empirical evidence exists that supports organizational learning (OL) in schools, however, studies on the prevalence, composition, and impact in American K-12 education is limited. Previous research in this area primarily investigated the formal implementation of OL with the assistance of outside experts.

This study was intended to assess the relevance of OL in the context of high stakes accountability experienced by American schools. Research methods were designed to examine current OL practices in the field and their effectiveness. Specifically, the study focused on relationships between organizational monitoring system practices and levels of student academic achievement. The first purpose of the study was to examine the practice of administering an annual staff survey designed to collect process data related to school attributes, and determine if the implementation of an annual staff survey was linked to a positive impact on student test scores in reading and math. This addressed

the first research question: Is there a significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's use of an annual staff survey that collects process data related to the occurrence of school attributes? The second purpose was to examine the type of data used in SIP development and student achievement levels to answer the second research question: Is there a significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan? The third purpose was to examine the use of comprehensive organizational monitoring practices and student achievement levels to answer the third research question: Is there a significant relationship between improvements in reading and math proficiency rates on the Washington State Measurement of Student Progress (MSP) in public middle schools and the school's implementation of comprehensive organizational monitoring?

Quantitative and qualitative analysis were utilized to answer the research questions as well as support claims regarding levels of validity and generalizability. Three predictor variables and one criterion variable were derived from the research questions. The first predictor variable was school use of an annual staff survey that collects process data related to the occurrence of school attributes. For this variable, Leithwood et al.'s (2006) model of effective schools served as the criteria for supporting attribute identification. The second predictor variable was school use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a



school improvement plan. The third predictor variable was school implementation of comprehensive organizational monitoring. The criterion variable was a composite score comprised of changes in the percentage of students who met standard in reading and math on the state standardized test between the 2012-2013 and 2013-2014 school year. The study also incorporated a confounding variable in the form of school free and reduced priced meals rate.

Sample schools used for statistical analysis were selected from a population of middle schools in Washington State based on school configuration and student enrollment. The primary goal of this study was to contribute to the developing body of literature concerning the relationship between organizational learning and school improvement by adding new substantive and practical knowledge.

### **Overview and Discussion of Findings**

This section provides a discussion of the study results in relation to each of the research questions. In addition, secondary analysis used to further inform the study results as well as determine levels of validity and generalizability are reviewed.

**Research question 1: Staff survey.** The statistical analysis conducted to determine if a relationship exists between the implementation of an annual staff survey that collects process data related to the occurrence of school attributes and standardized achievement scores was statistically significant. Detection of a statistically significant relationship leads to the rejection of the null hypothesis derived from the first research question. Findings of the correlational analysis demonstrated that administration of a staff survey is predictive of changes in the percentage of students proficient in reading and math. This was evidenced by the detection of a moderate positive relationship. The

implementation of a staff survey accounted for 27% of variance in student proficiency rates, indicating a reasonable level of practical significance. Provided the level of variance it is reasonable to suggest administering a survey on an annual basis that provides data on school attributes is related to student achievement. This finding supports organizational learning theory contending the monitoring of organizational attributes is positively linked to levels of effectiveness. Implementation of an annual staff survey appears to represent a practical method for engaging in organizational monitoring. It is reasonable to suggest systematic collection of data based on school attributes provides information that in some way informs practice.

**Research question 2: Process data in SIP development.** The statistical analysis conducted to determine if a relationship exists between school use of data collected from an annual staff survey that measures the occurrence of school attributes to develop a school improvement plan and standardized achievement scores was statistically significant. A small positive relationship was detected, demonstrating that implementation of process data in school improvement plan development is predictive of changes in the percentage of students proficient in reading and math. This leads to the rejection of the null hypothesis derived from the second research question. Despite the rejection of the null hypothesis, the implementation of process data in school improvement plan development accounted for 14% of variance in student proficiency rates. Although the relationship was statistically significant it does not appear using process data in the context of school improvement plan development is a substantial predictor of student achievement. This finding suggests the general concept of using process data related to school attributes in isolation to develop a school improvement

plan is not practically significant. The use of process data in this manner represents a relationship that may serve as one factor in the effective utilization of a comprehensive organizational monitoring system.

**Research question 3: Comprehensive organizational monitoring.** The statistical analysis conducted to determine if a relationship exists between the implementation comprehensive organizational monitoring and standardized achievement scores was statistically significant. This finding was evidenced by the detection of a moderate positive relationship. Results of the correlational analysis demonstrated that comprehensive organizational monitoring is predictive of changes in the percentage of students proficient in reading and math. The discovery of a statistically significant relationship leads to the rejection of the null hypothesis derived from the third research question. The implementation of comprehensive organizational monitoring accounted for 30% of the variance in student proficiency rates, indicating a moderate level of practical significance. It appears the development of a survey that measures individual monitoring practices effectively provided an indication of comprehensive organizational monitoring. The use of a scale score provided the basis for determining the level that schools were implementing comprehensive organizational monitoring with fidelity. Elements such as collecting data related to school attributes, the number of attributes monitored, number of years monitoring occurred, data analysis tactics, and attribute specific goal setting seemed to drive a positive relationship with student achievement. This supports organizational learning theory suggesting effective monitoring is a multifaceted process that is impacted by a number of practices related to collecting and using data about organizational attributes.

The culminating impact of individual practices demonstrated by the statistical analysis provides validation for the term comprehensive organizational monitoring. Utilization of a survey scale score offered a holistic assessment that appeared to inform levels of comprehensive organizational monitoring. Measuring the phenomena in this manner provided the information necessary to affirm the connection between comprehensive organizational monitoring and school effectiveness. Results demonstrated that the number of attributes schools indicated were monitored on school surveys was a strong driver of total survey scale scores. Provided the positive correlation between comprehensive organizational monitoring and standardized achievement scores, it is reasonable to suggest monitoring multiple attributes is a primary factor of impactful organizational monitoring. The use of Leithwood et al.'s (2006) model of effective schools to outline attributes for survey respondents to identify offers rationale for utilizing specific attributes to monitor. It appears the use of attributes based on effective schools research may be directly linked to the impact of comprehensive organizational monitoring. Further insight related to this conclusion is discernable in the frequency counts of the most commonly identified attributes on the research survey. The frequency counts demonstrate that certain attributes are more likely to be monitor than others. It is reasonable to speculate the variation in frequency counts can be linked to the value schools place on specific attributes. This suggests enhancement of comprehensive organizational monitoring is contingent on fostering an understanding of the range of attributes identified in effective schools research that schools should consider monitoring.

## Secondary Analysis

**Multiple regression #1.** The statistical analysis conducted to collectively correlate implementation of an annual staff survey and implementation of process data in school improvement plan development with standardized achievement scores was statistically significant. The initial model entry detected a statistically significant relationship between implementing an annual staff survey and student achievement scores. This was evidenced by the detection of a moderate positive relationship. Entry of implementing process data in school improvement plan development into the model also resulted in a statistically significant relationship, however, it did not account for a statistically significant amount of unique variance. This provides insight regarding the predictive nature of implementing a staff survey and using process data in school improvement plan development on standardized achievement scores. The nominal unique variance accounted for by using process data in school improvement plan development suggests is it not predictive of standardized achievement scores when also considering the role of implementing a staff survey. Results appear to indicate that acquiring the data represents more relevance than specifically using the data to develop a school improvement plan. This may demonstrate that data collected on school attributes is used in a number of ways to improve school organizations, and that effective utilization is not dependent on one type of use. The findings of this analysis also offers rationale for investigating organizational monitoring from a comprehensive perspective and that use of a survey to develop a scale score based on multiple monitoring practice is a necessary approach.

**Multiple regression #2.** The statistical analysis conducted to collectively correlate free and reduced priced meals rate and implementation of comprehensive organizational monitoring with standardized achievement scores was statistically significant. The initial model entry did not detect a statistically significant relationship between free and reduced priced meals rate and student achievement scores. However, the addition of comprehensive organizational monitoring to the model resulted in a statistically significant relationship. This was evidence by a moderate positive relationship. Analysis of the results revealed free and reduced priced meals rate did not account for a statistically significant amount of unique variance in the model. This provides insight regarding the predictive nature of comprehensive organizational monitoring and the potential generalizability of the study results. The absence of unique variance accounted for by free and reduced priced meals rate suggests comprehensive organizational monitoring is predictive of student achievement regardless of school demographics. Initial entry of free and reduced priced meals rate into the model demonstrated student poverty levels were not a confounding variable. This hierarchical entry order contributed to the validity of the conclusion regarding free and reduced priced meals rate. Findings also supported the use of a composite score based on changes in proficiency levels in reading and math as an indicator of school effectiveness. The lack of a statistically significant relationship from the first entry indicated the measure for effectiveness was not a confounding variable in the study.

**Staff survey item analysis.** A qualitative analysis was conducted to support the validity of the study findings and provide further insight on the composition of school survey instruments. Respondent schools who indicated the use of a staff survey were

solicited to provide their survey instrument and historical data. School surveys were returned by 14 respondent schools for analysis and the collection of historical data was unsuccessful due to the inability to acquire desired data. Respondents articulated confidentiality concerns and district policy as rationale for declining the data request. Surveys items were compared to Leithwood et al.'s (2006) effective schools model to verify respondents accurately indicated on the research survey the attributes measured on the school survey. This qualitative review resulted in quantitatively reporting the percentage of attributes schools accurately identified on the research survey. Analysis indicated a 70% mean accuracy rate in identifying the capacity of school surveys to measure specific attributes. The discovery of this accuracy level suggests schools maintain an adequate understanding of what surveys are actually measuring and are aware of specific attributes. In addition, findings support the validity of the research survey instrument used in the study to effectively measure organizational monitoring practices. It is pertinent to report comparison of school surveys and indication of measured attributes on the research survey revealed respondent accuracy error was due to under identification of attributes rather than over identification. This appears to indicate a tendency may exist to underestimate the capabilities of school surveys.

Qualitative review of staff surveys also provided insight on survey composition. The majority of school surveys utilized a multiple choice format to construct survey items. Likert scales used to indicate levels of agreement were the most common method for assessing the perceptions of respondents. Several school surveys provided a list of broad statements and requested comments in a narrative format. These schools indicated on the research survey that eight attributes were measured by the items, however,

qualitative review revealed the provision of broad statement likely does not reflect intentional monitoring of specific attributes.

The low number of respondent schools to the survey collection request and inability to evaluate historical data represent inhibiting factors to the qualitative phase of the study. Provided the limited number of surveys available for review, levels of generalizability were substantially reduced. Despite these factors, qualitative analysis of school surveys provided some insight into school understanding of monitoring attributes, validity of the research survey, attribute identification tendencies of respondents, and survey composition.

### **Summary of Results**

The outcomes of this study support the assertion that organizational learning is linked to student academic achievement. Statistical analysis demonstrated organizational monitoring practices that involve the collection and use of process data based on school attributes were linked to student academic achievement. Results suggest both substantive and practical significance to the body of knowledge concerning organizational learning. The specific practice of implementing a staff survey and using process data in school improvement plan development were found to be positively related to changes in the percentage of students proficient in reading and math. Analysis of implementing a staff survey produced a compelling moderate relationship. Construction of a research survey scale score designed to measure the culminating impact of multiple monitoring practices and subsequent analysis also produced evidence of a statistically significance relationship. This was characterized by a moderate positive relationship that demonstrated practical significance of implementing comprehensive organizational



monitoring. Secondary analysis provided further insight into the phenomena of organization monitoring and supported claims related to the validity and generalizability of the study. These findings affirmed the rejection of the null hypotheses aligned to each of the three research questions serving as the foundation for the study. This leads to the conclusion that organizational monitoring is a relevant methodology for schools seeking to improve. The use of a composite score comprised of changes in the percentage of students proficient in reading and math provided a measure of school effectiveness based on growth. Basis of the composite score on increases or decreases in the percentage of students proficient served as an indication of how the school was improving achievement. This type of measure seemed to control for demographic factors that typically influence the total percentage of proficient students. Rather than simply examining the overall percentage proficient in isolation, factoring the change over time demonstrated improvement even if a school recorded low overall proficiency levels. The validity of this methodology appeared to be validated by analysis indicating the relationship between free and reduced priced meals rate and the composite score was not statistically significant.

Provided the demographic similarities between the sample and the population as well as the nominal relationship between free and reduced priced meals rate and the study variables, it is reasonable to suggest the results can be generalized to middle schools with a similar configuration and level of student enrollment. Comprehensive organizational monitoring appears to warrant the most attention due to statistical findings. The concept of implementing a range of monitoring practices intended to collect and use data related to school attributes seems to generate a culminate predictive impact on student

achievement. This provides substantive significant in that it supports an articulation of critical monitoring practices outlined by organizational learning theorists. Empirical evidence suggesting these monitoring practices are related to desired school outcomes represents useful information. It appears comprehensive organizational monitoring in schools may inform systems thinking that results in organizational learning. The opportunity to acquire a holistic understanding of how the school organization is functioning may represent a tool for increasing organizational effectiveness. Practical significance can also be derived from the study findings as it offers educators a methodology for engaging in school improvement. This provides an alternative approach to relying solely on standardized tests scores to select reform initiatives.

**Limitations.**

*Internal validity.* The use of a researcher developed survey introduced several inhibiting factors to internal validity. Despite constructing survey items specifically intended to investigate the research questions of the study, content validity to measure organizational monitoring system practices was not verified by the use of the survey in multiple contexts. This represents a clear disadvantage to developing a survey rather than utilizing an existing tool available in the literature on this topic. It was determined constructing a survey was the most appropriate approach considering the availability of survey instruments aligned to the intent of the study. Although methods were utilized to verify content validity, it is necessary to recognize survey validity as a potential concern.

A limitation of internal validity is also represented by the interaction between research methods and respondent capacity. Data collection was reliant on school principals describing school practices related to organizational monitoring system

practices. The research survey instrument provided directions on the concept of monitoring school attributes and provided a list of attributes with sample elements, however, it is reasonable to suggest some principal respondents did not fully understand survey items. A pilot process designed to evaluate the clarity of survey items was conducted to mitigate this concern. In addition, qualitative research methods were implemented to validate the accuracy of respondents regarding identification of attributes on school surveys. Without follow-up interviews, it is difficult to assess respondent understanding of survey items. As a result, the potential negative impact of respondent understanding on internal validity must be recognized.

*External validity.* Several factors negatively impacted levels of external validity. The use of purposive sampling methodology represented intentional delimitation of generalizability. Criteria used to select sample schools among the population of middle schools in Washington State, confines the extrapolation of the results. Considering the sample exclusively included schools with enrollment above 300 students and a 6-8 grade configuration, caution should be made generalizing the conclusions to other types of schools. External validity was also likely impacted by the size of the sample group. The research survey response rate combined with the exclusion of sample schools due to data availability and outlier concerns resulted in a sample group of 42 schools. Although this represents an adequate number for the use of inferential statistics (Field, 2009), the inclusion of a larger number of schools would represent stronger external validity.

*Measurement.* The measurement methodology used to create a scale score designed to represent levels of comprehensive organizational monitoring was researcher developed, which may introduce issues regarding validity and reliability. Determining the

composition of survey items and the point-value system used to assign an overall score to each sample school was based on organizational learning theory (Leithwood et al., 2006). Despite a theoretical foundation, the scale score would be enhanced with further tactics to verify the score accurately indicates the level of comprehensive organizational monitoring taking place. It is not unusual for researcher developed instruments to have some degree of difficulty in providing accurate measurement. Therefore, it must be identified as a potential limitation to the study's results.

*Statistical analysis.* Problems related to normality were identified during the review of descriptive statistics. This was indicated by a kurtosis level outside of the recommended range for one of the data sets. Although the kurtosis indicated issues with the distribution of data, visual interpretation on a histogram graph and appropriate skewness levels supported the determination that adequate normality existed. This presents as a minor issue, however, it is appropriate to report such decisions as a possible limitation.

**Suggestions for further research.** The concept of becoming a learning organization by using a monitoring system to inform systems thinking represents an alternative approach to school improvement. Research is available that suggests a significant relationship exists between OL models and student achievement. Although empirical evidence provides support for OL in schools, studies on the prevalence, composition, and impact in American K-12 education is limited. The present study assessed the relevance of OL in the context of high stakes accountability experienced by American schools. Findings indicated that the organizational learning mechanism of utilizing organizational monitoring system practices are linked to student academic

achievement. This provided substantive and practical significance to the body of knowledge devoted to organizational learning. Future research should continue to investigate comprehensive organizational monitoring in American schools. The contribution of additional evidence offers the potential to further support the collection and use of process related to school attributes as an alternative approach to school improvement. It would be advantageous to include various grade configurations to study the phenomena in order to determine applicability to a broad range of school environments.

Methodologies to research comprehensive organizational monitoring should also include qualitative analysis to provide an extensive understanding of how monitoring practices are conducted in schools. Acquiring specific information regarding monitoring practices offers the potential to articulate a level of detail that could support replication. Several models for engaging in comprehensive monitoring system are available for practitioners to reference when seeking implementation. Advancing this body of literature in the context of K-12 American education may hold a high level of relevance. The provision of a detailed model for comprehensive organizational monitoring that is feasible in American schools could be a valuable outcome of future research. This could provide consistent models to investigate in order to further validate the efficacy of comprehensive organizational monitoring.

**Implications for school practice.** The current context of K-12 education revolves around how students perform on standardized tests. Schools are encouraged to evaluate results each year to inform school improvement planning. Some educational experts contend schools often rely solely on tests results to develop school improvement plans,

and as a result reform initiatives address symptoms rather than foundational issues. This leads to a cycle of incessantly selecting new initiatives each year that do not produce sustainable results. It also often represents an absence of organizational learning through the use of systems thinking. The efficacious findings derived from the present study supports an alternative approach to school improvement. Empirical conclusions provide valuable insight for better understanding the value of using a comprehensive monitoring system. This may serve as a solution for schools seeking to deviate from a continual cycle of responding to tests scores each year with a wave of new initiatives that are not successful. Considering schools are expected to develop highly effective school improvement plans, this information could be informative to a wide range of practitioners.

### **Conclusion**

Organizational learning represents a relevant concept for schools seeking to improve. The findings of the present study provides evidence that organizational learning practices related to organizational monitoring is linked to student academic achievement. Multiple aspects of organizational monitoring were investigated to determine levels of statistical significance. Practices related to the collection and use of data based on school attributes were correlated with changes in the percentage of students proficient in reading and math. Results provided evidence leading to the rejection of the null hypothesis aligned to each of the research questions. Secondary analysis indicated student demographics were not a substantial confounding variable and that the research survey demonstrated a reasonable level of validity. The study supported organizational learning theory suggesting organizational monitoring is linked to desired organizational outcomes.

Findings provided efficacious evidence that organizational learning practices related to organizational monitoring are applicable in the context of American schools. This methodology may represent an effective alternative approach to developing a school improvement plan. The continued research of comprehensive organizational monitoring could hold the potential to encourage a shift from relying on standardized achievement scores to determine how to improve school organizations. This may provide an avenue for schools to effectively identify and implement reform.

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## Appendix A

### Research Survey Instrument

**Directions:** This survey is intended to investigate school data practices in terms of the type of data collected and how the data is used. Specifically, the survey seeks to provide insight on the collection and use of data indicating the occurrence of school attributes. For the purpose of the study, the term attribute is used to represent school characteristics, practices, and processes. Prior to completing the survey, please review the list below of example school attributes and specific attribute elements that may be measured by a school.

Example Attributes:

- *Leadership and management:* includes elements such as identifying and articulating vision, fostering group goals, creating collaborative cultures, and monitoring school progress.
- *Mission and goals:* includes elements such as clarity, meaningfulness, awareness, immediate focus, and long-term focus.
- *Culture and community:* includes elements such as safe and orderly, positive, student centered, fosters learning for students, and professional work environment for student.
- *Planning and instructional services:* includes elements such as incorporates school goals, encourages support and understanding, monitoring of goal achievement, evaluation of planning, strategy use, and process outcomes.
- *Structure and organization:* includes elements such as instructional time, working conditions, facilitation of professional growth, maximizing student learning, and student groupings.
- *Data-driven:* includes element such as systematic collection, decentralized decision making, openness to external sources, school improvement decisions, and student assessment practices.
- *Policies and procedures:* includes elements such as coherence, student orientation, student awareness, resource allocation, staff development, and student service strategies.

- Community partnerships: includes elements such as community partnerships, postsecondary partnerships, parent/guardian participation, parent-school collaboration, community support services.
1. What is the name of your school?
    - Open Response
  2. What is your name?
    - Open Response
  3. How many years have you been in the role of principal at your current school?
    - 1 Year
    - 2 Years
    - 3 Years
    - 4 years or more
  4. What is the total number of certificated and classified staff members assigned to your school?
    - 1 – 25
    - 26 – 50
    - 51 – 75
    - More than 75
  5. Does your school collect any information on the attributes of your school?
    - Yes
    - No
  6. Does your school administer a survey to staff in order to measure any attributes of your school?
    - Yes
    - No
  7. If you administer an annual survey to staff, how many years has the survey been administered?
    - 1 Year
    - 2 Years
    - 3 Years
    - 4 year or more

8. If your school administers an annual survey to staff, are results evaluated to assess changes in the data over time?
  - Yes
  - No
  - N/A
  
9. If your school administers an annual survey to staff, are the results used to address areas of concern?
  - Yes
  - No
  - N/A
  
10. If you administer an annual survey to staff, which of the attributes outlined below does your school attempt to measure?
  - Leadership and management
  - Mission and goals
  - Culture and community
  - Planning and instructional services
  - Structure and organization
  - Data-driven
  - Policies and procedures
  - Community partnerships
  - Not Listed
  
11. If your school administers an annual survey to staff, does the school retain the results from previous years?
  - Yes
  - No
  
12. Does your school use information on attributes of your school to develop a school improvement plan?
  - Yes
  - No
  
13. Does your school use data from a staff survey designed to measure the occurrence of school attributes to develop a school improvement plan?
  - Yes
  - No
  
14. If your school uses data from an annual staff survey to assist development of a school improvement plan, are goals established to improve survey results over time?

- Yes
- No
- N/A

15. If your school uses data from an annual staff survey to assist development of a school improvement plan, are action steps included to improve specific school attributes over time?

- Yes
- No
- N/A

**Appendix B**  
**Statistical Analysis Tables**

**Correlation: Staff Survey and Composite Score**

		SurveyYes	CompositeScore
SurveyYes	Pearson Correlation	1	.521**
	Sig. (2-tailed)		.000
	N	43	43
CompositeScore	Pearson Correlation	.521**	1
	Sig. (2-tailed)	.000	
	N	43	43

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Correlations: SIP and Composite Score**

		SIPYes	CompositeScore
SIPYes	Pearson Correlation	1	.376*
	Sig. (2-tailed)		.013
	N	43	43
CompositeScore	Pearson Correlation	.376*	1
	Sig. (2-tailed)	.013	
	N	43	43

\* . Correlation is significant at the 0.05 level (2-tailed).

**Correlations: Survey Scale Score and Composite Score**

		SurveyScore	CompositeScore
SurveyScore	Pearson Correlation	1	.553**
	Sig. (2-tailed)		.000
	N	43	43
CompositeScore	Pearson Correlation	.553**	1

Sig. (2-tailed)	.000	
N	43	43

\*\* . Correlation is significant at the 0.01 level (2-tailed).

#### Regression: Staff Survey/SIP and Composite Score

		CompositeScore	SurveyYes	SIPYes
Pearson Correlation	CompositeScore	1.000	.521	.376
	SurveyYes	.521	1.000	.580
	SIPYes	.376	.580	1.000
Sig. (1-tailed)	CompositeScore	.	.000	.006
	SurveyYes	.000	.	.000
	SIPYes	.006	.000	.
N	CompositeScore	43	43	43
	SurveyYes	43	43	43
	SIPYes	43	43	43

#### Regression: Staff Survey/SIP and Composite Score - Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.521 <sup>a</sup>	.272	.254	10.66000	.272	15.291	1	41	.000
2	.529 <sup>b</sup>	.280	.244	10.73108	.008	.459	1	40	.502

a. Predictors: (Constant), SurveyYes

b. Predictors: (Constant), SurveyYes, SIPYes

#### Regression: Staff Survey/SIP and Composite Score - Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

1	(Constant)	-39.529	8.879		-4.452	.000
	SurveyYes	18.345	4.692	.521	3.910	.000
2	(Constant)	-40.156	8.986		-4.469	.000
	SurveyYes	16.071	5.795	.457	2.773	.008
	SIPYes	2.902	4.285	.111	.677	.502

a. Dependent Variable: CompositeScore

**Regression: Free and Reduced Lunch Rate/Survey Scale Score and Composite Score**

		CompositeScore	FreeReduced	SurveyScore
Pearson Correlation	CompositeScore	1.000	-.060	.553
	FreeReduced	-.060	1.000	.226
	SurveyScore	.553	.226	1.000
Sig. (1-tailed)	CompositeScore	.	.352	.000
	FreeReduced	.352	.	.072
	SurveyScore	.000	.072	.
N	CompositeScore	43	43	43
	FreeReduced	43	43	43
	SurveyScore	43	43	43

**Regression: Free and Reduced Lunch Rate/Survey Scale Score and Composite Score - Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.060 <sup>a</sup>	.004	-.021	12.46834	.004	.147	1	41	.704
2	.585 <sup>b</sup>	.342	.309	10.25807	.338	20.572	1	40	.000

a. Predictors: (Constant), FreeReduced

b. Predictors: (Constant), FreeReduced, SurveyScore

**Regression: Free and Reduced Lunch Rate/Survey Scale Score and Composite Score - Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-3.984	4.153		-.959	.343
	FreeReduced	-.029	.077	-.060	-.383	.704
2	(Constant)	-18.804	4.728		-3.978	.000
	FreeReduced	-.096	.065	-.195	-1.479	.147
	SurveyScore	1.266	.279	.597	4.536	.000

a. Dependent Variable: CompositeScore