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Data-Driven School Administrator Behaviors and State Report Card Results

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DATA-DRIVEN SCHOOL ADMINISTRATOR BEHAVIORS AND STATE REPORT CARD RESULTS

by

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DEDICATION

To my parents, James A. Spencer Sr. and Helen D. Spencer who taught me the most important lessons in life.

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ABSTRACT

The purpose of this study was to identify the principal behaviors that would define an instructional leader as being a data-driven school administrator and to assess current school administrators' levels of being data-driven. This research attempted to examine the relationship between the degree to which a principal was data-driven and the school's performance on standardized tests and state report card values.

The research questions are:

1. To what degree do current school principals in select districts from the Charleston area of South Carolina see themselves as data-driven leaders?

2. To what extent are the 12 specific behaviors that define a data driven principal, as self-reported, present in these principals?

3. To what extent is there a relationship between the data-driven level of the principals and:

a. Percent of students who pass their End of Course (EOC) test(s) in Grades 8-12

b. Percent of students in Math and English/Language Arts scoring Met & Exemplary on the Palmetto Assessment of State Standards (PASS) in Grades 6-8

c. Percent of students who score Proficient & Advanced on the High School Assessment Program (HSAP) Assessment in Grade 10

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CHAPTER 1

INTRODUCTION TO THE STUDY

Statement of the Problem

In the last twenty years, the role and the responsibilities of the school principal have changed. A big part of the change is a result of the increased demands of the principal to utilize data in the data-driven decision making (DDDM) process and to help principals make informed decisions. "The use of data to inform educational decisions has recently drawn increased attention, spurred largely by accountability requirements set forth at the state and federal levels. A familiar example is the 2001 No Child Left Behind (NCLB) legislation which mandates a significant increase in the gathering, aggregation, and upward reporting of student-level data" (Wayman, 2005, p. 295). There is little doubt that the (NCLB) legislation has forced school administrators to become more involved with school data, but do those leaders have the necessary skill sets to be effective data-driven leaders? Are schools with data-driven principals experiencing higher rates of student achievement than schools without data-driven leaders? These are important questions because the answers could have an effect on student achievement.

Frederick Hess addresses the former question in an article written in 2005 entitled *The Accidental Principal* where he states, "Indeed, the principal's critical role in the No Child Left Behind era may just be taken for granted. There is growing evidence to

suggest that the revolution in school organization, management, and curricular affairs may have left principals behind (p. 35). To support this position, Hess cites a 2005, four-year study by the president of Teachers College, Columbia University, Arthur Levine, who stated, "the majority of [educational administration] programs range from inadequate to appalling, even at some of the country's leading universities. In particular, the study found that the typical course of studies required of principal candidates was largely disconnected from the realities of school management" (p. 36). If Levine's assertions are correct, school leaders would do well to find a way to attain the necessary skills to gather data, analyze data, and then make appropriate data-driven decisions as (NCLB) demands.

A Personal Perspective

I have been interested in the topic of data-driven school leadership for several important reasons. First, I am a scientist by profession and more specifically a biologist. I would further describe this researcher as a logical, positivistic researcher in the field of science. In investigating any phenomenon, I have always believed that there is a direct cause and effect relationship and, further, that this closed systems approach of cause and effect can be quantitatively studied to determine correlational and causal relationships. When I made the career move from science to education, I naturally brought my conceptual frame, or lens, with me. I would describe my lens as an amalgamation of Machine Theory and Logical Positivism. After having served as a principal for the last twelve years, I still become excited each year as I gather, disaggregate, and analyze school data and ultimately make informed, data-driven decisions. This is a great passion

of mine, and in this new day of accountability, I feel blessed that I have the skills to do this effectively and to positively affect student learning in the process!

Conceptual Framework

A strong belief of advocates of DDDM is that, if it is done well, it will produce increased student achievement. For example, Creighton asserts that DDDM is a hallmark of good instructional leadership. Principals and teachers can learn to maneuver through the statistical data to help create goals and strategies for change and improvement (2001, p.52). In a paper prepared for the Annual Meeting of the National Council of Professors of Educational Administration in July of 2005, Halverson states, "The recent demand for schools to respond to external accountability measures challenges school leaders to create school instructional systems that use data to guide the practices of teaching and learning" (2005, p.2). The assertion from the work of researchers in the area of data-driven leadership including (Creighton, 2001; Halverson, 2005; Lachat, 2006) is that, in this era of accountability, increased student learning can be a reality with proper analysis of the data and ultimately making curricular and pedagogical changes based upon the data. If gaps exist in the research it is that there appears to be limited information as to the practices, knowledge, or behaviors which would define a school principal as being data-driven. Further, to what extent is there a relationship between DDDM behaviors and increased student achievement?

The conceptual framework for this research study contains elements from both the Logical Positivism Theory and Scientific Management Theory. Both theories are closed-systems theories and thus assume that the answers to questions and problems can be

found from within the organization. Towards this research study, Logical Positivism contributes the idea of cause and effect or relationship among variables, and Scientific Management Theory contributes the concept of studying the component processes in a scientific way to improve the desired outcome product.

The historical context of the epistemology and theoretical perspective of Positivism is detailed in Crotty's book (1998) entitled *The Foundations of Social Research*. "This positivist perspective encapsulates the spirit of the enlightenment, the self-proclaimed Age of Reason that began in England in the seventeenth century and flourished in France in the century that followed" (p. 18). "Like the Enlightenment which gave it birth, positivism offers assurance of unambiguous and accurate knowledge of the world" (p. 18). Crotty (1998) further explains that Positivism is directly related to science as a way of knowing about the world in an objective fashion.

> For many adherents of positive science ('positivists', therefore), what is posited or given in direct experience is what is observed, the observation in question being scientific observation carried out by way of the scientific method. This is certainly the understanding of positivism that prevails today. (p. 20)

Crotty describes the Positivism of today as Logical Positivism.

> Quite clearly the meaning of the term "positivism" has changed and grown over time. So much that, from the standpoint of the Vienna Circle and in terms of the contemporary understanding of positivism, its acknowledged founder, Auguste Comte, hardly makes the grade. In the history of ideas, the pathway trodden by positivism turns out to be long, torturous and

> complex. Logical positivism has obviously played a major role in developing the concept of positivism that obtains at present time. (p. 26)

Although the theoretical perspective of positivism may have evolved since the sixteenth century, the concept of cause and effect still forms the foundation for the theory. In the behaviors and desired outcomes associated with DDDM, school leaders are searching for the answers to increased student achievement by way of trying to understand the cause and effects or the relationships that are present in the data.

At the heart of the Scientific Management Theory is the belief that systems and processes can be improved when the parts of the systems and processes are examined scientifically and adjusted to improve the performance of the whole. Industrialist Frederick Taylor is considered the father of Scientific Management (Marion, 2002). Taylor's work covered a broad stroke with respect to industry, production, and the role of management and the worker.

> Frederick Winslow Taylor is a controversial figure in management history. His innovations in industrial engineering, particularly in time and motion studies, paid off in dramatic improvements in productivity. At the same time, he has been credited with destroying the soul of work, of dehumanizing factories, making men into automatons. (Skymark.com 2013 p.1 Retrieved from http://www.skymark.com/resources/leaders/taylor.asp)

The concepts which emerged from Taylor's work with respect to productivity and studying systems for the purpose of improvement of performance and output contribute to the conceptual framework for this study. There are certainly other parts of Taylor's

work, such as the discretion of the individual worker, which still have a profound effect on education today; however, these aspects are outside the scope and the conceptual framework of this particular study.

Purpose of Research

The purpose of this research is to consider the role that the actual behaviors and skills utilized by data-driven school principals might play in supporting student performances. Data-driven decision making (DDDM) is a phrase that seems to dominate the latest reform movements with respect to educational leadership (Marsh, Pane, & Hamilton, 2006; Messelt, 2004; Marzano, 2005). From administrative interviews to work within Professional Learning Communities in schools, the phrase is uttered with some confidence that there is some universal understanding of what data-driven leadership or (DDDM) looks like, or, more importantly, the behaviors and skills that define them. This study will seek to add clarity to the knowledge and skills associated with DDDM and assist current principals with assessing their own levels of DDDM.

Research Questions:

Drawing from select school leaders, in a small southeastern state, the research will explore the presence of and possible role of DDDM in local decision-making. Toward that understanding, the research will consider the following questions:

1. To what degree do current school principals in select districts from the Charleston area of South Carolina see themselves as data-driven leaders?

2. To what extent are the 12 specific behaviors that define a data driven principal, as self-reported, present in these principals?

3. To what extent is there a relationship between the data-driven level of the principals and:

a. Percent of students who pass their End of Course (EOC) test(s) in Grades 8-12

b. Percent of students in Math and English/Language Arts scoring Met & Exemplary on the Palmetto Assessment of State Standards (PASS) in Grades 6-8

c. Percent of students who score Proficient & Advanced on the High School Assessment Program (HSAP) Assessment in Grade 10

A point of clarification may be useful regarding Question 3. For the purposes of this study, the researcher will assign the principal respondents a data-driven level of 1, 2, or 3. This categorization will be based upon the number of data-driven critical skills the principal respondents self-reported on the on-line survey. This data-driven level will then be correlated with the respective state report card values indicated in research question 3. Chapter three will further describe the methodology and define the data-driven skills utilized for this study.

Delimitations and Assumptions of Research

The researcher narrowed this study by first studying only school principals and schools from five selected districts in the Charleston area of South Carolina which had grade levels of 3 or higher. Secondly, only public schools were utilized, because both

Palmetto Assessment of State Standards (PASS) and High School Assessment Program (HSAP) scores and state report cards were obtainable for the correlational statistical analysis. South Carolina virtual schools were not included in this research study. For the purposes of this study, the researcher must assume that the principal respondents in the survey were honest and responded to all of the survey questions with integrity.

Limitations

There are three limitations to the study:

1. Researcher Bias – The researcher considers himself to be a strong data-driven school principal. This bias might affect the interpretation of data analysis and responses.
2. Principal Survey Behavior – When principals respond to the survey, they may inflate their self-perceptions of the data skills they use due to the many pressures placed upon school principals to be viewed as data-driven leaders.
3. Sample Size – Surveys were sent to 169 principals who have grade structures of grade 3 or higher from the following school districts in South Carolina: Aiken County School District, Berkeley County School District, Charleston County School District, Dorchester District Two, and Dorchester District Four. These districts were chosen because they are convenient for the purposes of e-mail and state report card attainment; additionally, they are in close proximity to the researcher should a problem arise with data attainment. This sample size could restrict the study's findings, conclusions, and generalizations. In addition to the sample size restricting generalization to the

state, the demographic make-up of these five school districts do not perfectly mirror the state's demographic make-up which restricts the generalization.

Significance of Research

The significance of this research is first to assist school principals to assess the presence of and then better understand their own level of being data-driven and secondly to have a clearer understanding of the specific behaviors which are critical to being a data-driven school principal. "In the current context of accountability and school reform, *data-driven decision making* is increasingly seen as an essential part of the educational leader's repertoire" (Knapp, Swinnerton, Copland, and Monpas-Huber, 2006, p. 5). In addition, the study will add clarity to the present understanding of the concept of DDDM.

Definition of Key Terms

For the purposes of this research, the following definitions were utilized:

1. Data-driven decision making (DDDM)- the collection, examination, analysis, interpretation, and application of data to inform instructional, administrative policy, and other decisions and practice
2. Data-warehouse- a large store of data accumulated from a wide range of sources within the organization and used to guide management decisions
3. Disaggregation of data- to divide the data into constituent parts for analysis
4. EOC- End of Course test
5. HSAP- High School Assessment Program, a norm-referenced exam given to 10^{th} grade students in South Carolina

6. Logical Positivism – a modern philosophical view of the epistemology of Positivism
7. PASS- Palmetto Assessment of State Standards, a norm-referenced exam given in grades 3-8 in South Carolina
8. No Child Left Behind Federal Legislation (NCLB) - a federal law passed in 2001 under the George W. Bush administration. NCLB represents legislation that attempts to accomplish standards-based education reform.
9. Pearson Correlation-In statistics, the Pearson product-moment correlation coefficient is a measure of the linear correlation between two variables X and Y, giving a value between +1 and −1 inclusive, where 1 is total positive correlation, 0 is no correlation, and −1 is negative correlation.

Organization of Remaining Chapters

This study was organized in a traditional fashion. Chapter Two is an examination of the literature which already has been completed with respect to data-driven school leadership. Topics within the literature review include the historical context of data-driven management, NCLB, data-driven behaviors, and state report card student achievement indicators. Chapter Three outlines and explains the design and methodology of the research. This section includes the study design, rationale, participation explanations, data gathering methods, and data-analysis procedures. The positionality of the research, the subjectivity, ethical considerations, and the limitations of the study are also addressed in Chapter Three. Contained within Chapter Four are the data, the associated analysis of the data, and the study findings. Chapter Five is an analysis and

discussion of the findings which includes the implications of the study and thoughts about the generalizability of the research.

CHAPTER 2

LITERATURE REVIEW

This literature review first examines the historical context of DDDM beginning with a global business perspective and narrowing to explore data-driven school management. Next, the discussion shifts to explore how the NCLB Act changed data-driven school leadership. The review of literature then starts to specifically examine DDDM skills and behaviors and the barriers which limit school leaders from using DDDM. Finally, the literature review concludes by examining the academic indicators from the South Carolina State Report Card which were utilized within this study to examine the use of data-driven school principals' behaviors and the relationship to their academic student achievement.

Historical Context

The idea or concept of DDDM does not have a clearly defined inception date or even a person who can be identified as the originator of this practice. With this said, most researchers credit Frederick Taylor and his work related to the Scientific Management Movement as the quasi beginning. "Industrialist Frederick Taylor is considered the father of Scientific Management, but Taylor was hardly the only actor in its development" (Marion, R. 2002, p. 22).

> Documents from Midvale Steel Company (where Taylor did his early work) suggest that Charles Brinkley, a chemist at Midvale, developed time study and piece-rate practices before Taylor even arrived at Midvale (Midvale Steel Company of Philadelphia, 1917). Taylor and Scientific Management, then, did not emerge in a vacuum and Taylor did not single-handedly create Scientific Management. Clearly, however, his work brought this "science" to its maturity and it was Taylor who popularized its ideas; for that reason, we call him its father. (Marion, 2002, p. 23)

Marion (2002), in his book entitled *Leadership in Education*, further expounds on the contributions of Frederick Taylor. "Discovering the most efficient methods for performing a task was only half the battle, however; Taylor knew that management techniques had to be developed for ensuring that standardized procedures were implemented. He consequently developed four managerial activities" (Marion, 2002, p.24). The four activities he developed were:

1) Careful bookkeeping to track productivity and to provide ongoing data for analysis
2) Careful planning of workflow procedures
3) Functional foremanship
4) Worker motivation

Allen (1979), in the abstract to her article entitled *Taylor-Made Education: The Influence of the Efficiency Movement on the Testing of Reading Skills*, summarizes some of the changes in education as a result of what is referred to as "Cult of Efficiency" or the

effects of education based on Frederick Taylor's popular work in the early twentieth century.

> Much of what has developed in the testing of reading harkens back to the days of the "Cult of Efficiency" movement in education that can be largely attributed to Frederick Winslow Taylor… Education embraced most of Taylor's principles in the early 1900s, and journal articles of the period have documented the extensive influence of this "Cult of Efficiency" on the thinking of educational leaders. It is more than coincidental that standardized tests in subject areas first appeared around 1910, when Taylor and his educational followers were most vocal. The essay test was also replaced with objective tests that took little time to complete and less time to grade. Speed and factual recall, rather than critical comprehension, continue to represent the two most widely tested aspects of reading, although research has confirmed that speed is not an ample measure of reading ability. (p. 1)

Taylor's work with respect to data collection, analysis, and efficiency in business had a profound effect on the leadership in education. Another example of effective business practices transcending from business to education is the Total Quality Management Theory.

Total Quality Management Deming

In the business world, very little changed with respect to improvement or the use of data-driven practices until Edwards Deming's work and writings were employed.

> Deming was born in 1900 and died in 1993. Almost up to his death he was unbelievably active in promoting quality. He never established an "institute "or school like other quality gurus but, for the most part, was in the private consulting business working out of Washington, D.C. He has probably had more influence on American business than any other person except, perhaps, Fredrick Taylor. (Austenfield, 2001, p. 49)

Deming's work in the world of business and the philosophy he developed was termed Total Quality Management. In essence, the important contribution of his work was his emphasis on the need to collect and analyze data to serve as the foundation for change and continuous improvement. By profession, Deming was a statistician (No author, 2013, History The W. Edwards Deming Center for Quality, Productivity, and Competitiveness).

> He became a student of Walter Shewhart (who led the quality control effort during the war and developed Statistical Quality Control) while working at Bell Telephone Laboratories. In 1946, Dr. Deming led the formation of the American Society for Quality Control and became a professor of statistics in the Graduate School of Business Administration at New York University.
>
> (No author, 2013, History The W. Edwards Deming Center for Quality, Productivity, and Competitiveness)

Data and statistics became the heart of Deming's philosophy for improving product production efficiency and quality. "In time, Deming hit on the idea of using statistics to quantify the manufacturing process: how efficient companies were, how good

their products were, and how well companies were managed" (McInnis, 2013, p.1). Several well-known American companies hired Deming to improve their companies. The list of companies included: Ford Motor Company, Xerox Corporation, Proctor & Gamble, AT&T, and The New York Times (McInnis, 2013). As was the case in the beginning of the twentieth century where the positive effects of Frederick Taylor's work in the area of business entered the realm of public education, so, too, did the effects of Edwards Deming's work influence business and education late in the twentieth century. "In many ways, a data-driven instructional system reflects the central concepts of the organizational quality movement inspired by W. Edwards Deming. Deming's ideas inspired organizations to move beyond bottom-line results to focus on embedding quality cycles throughout the organization" (Halverson, Grigg, Prichett & Thomas, 2005, p. 8).

It is noteworthy that Deming, a clear supporter of DDDM, warns about being careful regarding the use of DDDM in our schools and avoiding a potential misuse of DDDM.

> W. Edwards Deming, a major force behind the quality movement in the United States, repeatedly warned that a heavy reliance on single goals or other narrowly defined evidence of success tends to encourage people to tweak the system rather than make the fundamental changes needed in schools and classrooms to ensure student mastery of standards. Making the right numbers appear becomes more important than improving the system. (Cawelti, 2006, p. 64)

Schools and DDDM Prior to NCLB

To some degree, schools have always been data-driven. What has changed over time is the type and amount of data utilized. Gordon and Bridglall (2003) explain that data was used in schools as early as the late 1940's to make decisions about educational practices. Marsh, Pane, and Hamilton (2006) assert that DDDM in schools is based upon the practices of Total Quality Management, Organizational Learning, and Continuous Improvement. "The concept of DDDM in education is not new and can be traced to the debates about measurement-driven instruction in the 1980's" (Marsh et al., 2006, p. 2). Schmoker (2004) provides the example of the *strategic planning movement* in education in the 1980's and 1990's as an example of DDDM in schools.

No Child Left Behind

> Schools have been collecting data for decades, but it hasn't been until recently that most school district leaders have discovered the power of data for promoting school improvement. Much of the recent focus on data has been triggered by the No Child Left Behind (NCLB) legislation that is intended to increase student achievement across all socioeconomic boundaries and improve results at "low performing" schools. (Messelt, 2004, p. 2)

As Messelt (2004) asserts in his article entitled *Data-Driven Decision Making: A Powerful Tool for School Improvement*, the act of collecting data is not a new concept for schools but a shift in the type of data collected as a result of the NCLB Act.

> In 2002, those responsibilities increased drastically with the passage of the NCLB Act. Whether or not you agree with the legislation's scope and intent, NCLB has heightened awareness and attention on student data to a new level across the country. As a result of NCLB, school administrators are now responsible for monitoring and enabling student and teacher performance improvement, broken down by important subgroups. This kind of reporting typically requires a sophisticated system for data collection and analysis. (p. 3)

As many researchers have stated, the NCLB Act increased the use of data from the classroom to the district office (Creighton, 2001; Halverson, 2005; Larocque, 2007; Messelt, 2004). In addition, the research tells us that since the initial years following NCLB the use of (DDDM) has not waned but, in fact, continues to increase. "In recent years, the education community has witnessed increased interest in data-driven decision making (DDDM) making it a mantra of educators from the central office, to the school, to the classroom" (Marsh et al., 2006, p. 1).

> New state and local test results are adding to the data on student performance that teachers regularly collect via classroom assessments, observations, and assignments. As a result, data are becoming more abundant at the state, district, and school levels—some even suggest that educators are "drowning" in too much data. (Marsh et al., 2006, p. 1)

Margaret Spellings (2005), the secretary of Education in the Bush Administration until January 2009, summarized the need for data: "…thanks to No Child Left Behind, we're no longer flying blind" (Mandinach & Jackson, 2012, p. 13).

Since the inception of NCLB, the use of DDDM has increased dramatically, and there does not seem to be any waning as with so many prior educational programs or paradigm shifts.

> Data-driven decision making has become an important topic linked to accountability, school improvement, and educational reforms. In fact, data have been pronounced to be "cool" by educational policy makers. Data use is no longer a passing fad, one to which educators can close their doors and assume it will go away until the next innovative idea appears. (Mandinach & Jackson, 2012, p. 11)

In the words of Schmoker (2009), a strong advocate of DDDM, "Data-driven decision making is here to stay. Throughout the last decade, educators have come to embrace data as an indispensable tool for school improvement" (p. 70).

Behaviors of Data-Driven School Leadership

"Accountability demands are increasingly forcing school leaders to explore much more the granular data and to do more sophisticated analyses. Data-driven decision making (DDDM) has become an emerging field of practice for school leadership" (Luo, 2008, p. 604). "Nationwide standards-based control and outcome-based funding have brought DDDM to the top of every principal's agenda" (Leithwood, Aitken, & Jantzi, 2001). Researchers in the field have asserted that school principals, as a result of NCLB, need to utilize DDDM (Creighton, 2001; Halverson, 2005; Lachat, 2006). With all of this attention on DDDM in educational research, a question still remains. What are the skills and behaviors which would be employed by a data-driven school leader?

The skills and behaviors, which are necessary for a principal's successful implementation of DDDM, are scattered within the research related to DDDM and education. This, in itself, is a gap within the educational research. DDDM is discussed within many contexts, but what is lacking is a simple, comprehensive list of skills and behaviors that administrators can refer to as they seek to become better data-driven instructional leaders. What follows is an attempt to create such a list based upon the research in the field. The DDDM behaviors, skills, and knowledge are presented in the following five general topics: Statistics and Math, Data-Literacy, Technology, Culture, and Communication.

Statistics and Math.

In order for DDDM to be affective in schools, principals must have the requisite attitudes, knowledge, and skills. More specifically, they must value data as a useful and meaningful tool for improving teaching and learning; furthermore, they must possess the knowledge to analyze, interpret, and apply data for instructional improvement as well as impart such understandings to teachers (Keeney, 1998). This amounts to the understanding that besides having a foundation in the *creation of a data-culture*, an understanding of *data-literacy*, and having the *appropriate technology*, a principal must understand the *basics of algebra* and *statistics* to not only perform data analysis but also to teach these skills to their staffs. According to Choppin (2002), principals' skills related to DDDM are directly related to their educational background and training.

According to Carroll and Carroll (2002), authors of the book *Statistics Made Simple for School Leaders*, data collection and data-mining have become easier with the

vastly improved data-warehouse software packages, but this has not eliminated the statistical paralysis with which many educational leaders struggle.

> Many educational leaders feel uncertain and uneasy about statistical procedures, statistical analysis, and the interpretation of results. Their graduate school classes in research design and statistics were mathematically difficult, were highly technical, and perhaps most importantly, lacked real application to the issues they encountered on the job. Statistics became synonymous with innumerable calculations and the memorization of formulas. (p. xi)

Data-Literacy.

Knapp et al., (2006) defines data-literacy as the process of using data to inform actions. This is a broad definition, and it encompasses additional skills from statistics to technology. Lachat (2006) offers a slightly narrower definition of data-literacy: **"**Schools today are more data rich than ever, requiring staff members to develop their data literacy— that is, their knowledge of how to use assessment data with other types of data to identify areas of effectiveness and to target instructional improvement efforts" (p. 17).

In a paper written by Mandinach, Gummer and Muller (2011) based on the discussions at a conference sponsored by the Spencer Foundation's Initiative on *Data Use and Educational Improvement* in 2011, Mandinach cites her earlier work from 2008 and outlines six essential DDDM skills: *collecting data*, *organizing data*, *analyzing information*, *summarizing information*, *synthesizing knowledge*, and *prioritizing*

knowledge. In addition, she adds another skill from her work in the field from 2010 and terms it *pedagogical data literacy* which involves taking the data and transforming them into actionable instruction using pedagogical content knowledge (Mandinach et al., 2011).

> For many leaders, becoming data literate means developing new capacities for using data effectively. While there have often been modest attempts to boost educational leaders' ability to understand data tables, interpret statistics, and present quantitative information about performance more effectively, attempts to develop a deeper level of data literacy are seldom reported in the literature. (Knapp et al., 2006, p. 23)

Technology.

Carroll and Carroll (2002) share an analogy to help us understand the current dilemma of school leaders and their lack of a basic statistical understanding.

> To some extent, the software technology and statistical packages have provided a new automobile but no course in drivers' education. Without a basic knowledge of statistics, the use of statistical software and data management technology can provide schools with misinformation that can have serious consequences. (p. xi)

"Educational leaders will need basic skills and at least a minimum level of expertise to transform their vast data warehouses into powerhouses of information delivery. To do this, they will need to use statistics correctly, judiciously, and strategically" (Carroll & Carroll, 2002, p. xii).

As cited by Luo, 2008, "Thus, it is the priority of DDDM for principals to have basic understanding of applied statistics, data analysis skills, and other necessary *computer skills*" (Thornton & Perreault, 2002). "Using data effectively at the school, program, learning community, and classroom levels requires disaggregating assessment results by multiple student characteristics" (Lachat, 2006, p. 19). One of the technological tools available today to help school administrators manage their data and disaggregate data in meaningful ways is a data-warehouse.

> In all of the schools we worked with the key technology tool used to perform this type of data disaggregation was a data warehouse application that created a fully integrated database that linked data from school information systems, state assessment files, standardized test files, and other data sources. (Lachat, 2006, p. 19)

Data warehouse software systems are not always easy to learn and require some training to be able to use the systems effectively and efficiently.

Culture.

The school culture plays a part in the success of a DDDM program (Noyce, 2000; Fullan, 1999; Massell, 2001). "Data-driven school cultures do not arise in a vacuum" (Noyce et al., 2000, p. 54). To create a data-driven school culture, schools need a strong leader who serves as a champion for DDDM in order to improve student achievement within the school. Grigsby and Vesey (2011) assert that principals should act as the lead professional developers in the school and establish a supportive learning environment for their staffs. "Leadership is needed to provide a positive, resounding insistence that all

teachers, by team, analyze their data and then set and know both their goals and the areas where teaching must be improved" (Schmoker, 2006, p. 11). Principals by the very nature of their position are able to establish the culture within their respective schools.

Communication.

"The final dimension of a DDDM principal is communication. In order for school improvement to be successful, purposeful communication cannot be underestimated" (Grigsby & Vesey, 2011, p. 20). As cited in Grigsby and Vesey (2011) "The principal, acting as leader, professional developer, and communicator is the one who ultimately provides the necessary instructional leadership, tools, and resources to ensure faculty are effective in the classroom" (George, 2002). In addition to the internal communication to the staff, the principal is also responsible to communicate externally to the school's stakeholders.

> An effective way to build public support and increase community confidence is to show key stakeholders how districts and schools are being held accountable for results. Sharing data in easy-to-read charts and short, jargon-free reports not only lets community members know that schools are making informed decisions based on data, but also can create a deeper community understanding of the issues facing public education. (Messelt, 2004, p. 10)

Messelt (2004) further makes the point that schools should not rely on the media alone to communicate the school's message. The story the media reports may not always be accurate.

ELCC Standards

The ELCC standards of 2002 serve as school leadership preparation program standards and can be used as a cornerstone for the professional development of existing school administrators (Luo, 2008). These standards support the researcher's claim that specific, defined skills are required to be a DDDM leader. "Compared to the old standards, the revised standards have more emphasis placed on school administrators' ability and knowledge in using data. DDDM is integral to the key school administrators' skills in all the area standards" (2008, p. 605). The ELCC standards, which were adopted a year after the NCLB law was put into action, give us at least a glimpse of some of the skills and behaviors necessary for DDDM. In all seven of the standards and indicators published, DDDM skills are denoted. The following are examples from the published standards:

> **Standard 1.0:** Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by facilitating the development, articulation, implementation, and stewardship of a school or district vision of learning supported by the school community.
>
> **Indicator:** b. Candidates demonstrate the ability to use *data-based research* strategies and strategic planning processes that focus on student learning to inform the development of a vision, drawing on relevant information sources such as student assessment results, student and family *demographic data*, and an *analysis of community needs.*

Standard 2.0: Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by promoting a positive school culture, providing an effective instructional program, applying best practice to student learning, and designing comprehensive professional growth plans for staff.

Indicator: c. Candidates demonstrate the ability to use and promote *technology and information systems* to enrich curriculum and instruction, to monitor instructional practices and provide staff the assistance needed for improvement.

Standard 3.0: Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by managing the organization, operations, and resources in a way that promotes a safe, efficient, and effective learning environment.

Indicator: a. Candidates demonstrate the ability to optimize the learning environment for all students by applying appropriate models and principles of organizational development and management, *including research and data-driven decision making* with attention to indicators of equity, effectiveness, and efficiency.

(National Policy Board for Educational Administration, Published January, 2002)

In all seven of the standards, DDDM behaviors and skills from statistics, data-literacy, technology, culture, and communication are referenced in the standard indicators.

Barriers to the Use of Data-Driven Decision Making

Within the research literature of DDDM, there is substantial information presented concerning the necessary components to implement DDDM (Bernhardt, 2009; Lachat et al., 2006; Marsh et al., 2006; Mandinach et al., 2011). However, there is also information in the literature regarding the barriers to the implementation of DDDM in schools (Creighton, 2001; Demboskey, Pane, Barney & Christina, 2005; Wayman, 2005). These barriers fall into three general areas: The lack of math and statistical knowledge, the lack of quality principal preparation programs, and the lack of technology.

Creighton (2001) advocates that principals should employ DDDM but explains that many do not for several reasons. The first barrier that Creighton (2001) speaks to is fear itself. "To most educators, statistics means endless calculations and formula memorization. Statistics is perceived as the formal domain of advanced mathematics and as a course taught by professors who desire to make their students' lives as painful as possible" (p. 52). The truth, as Creighton (2001) explains it, is that if you have passed a high school algebra class you have the knowledge and skills required to understand statistical analysis.

Creighton (2001) attributes educators' fear of statistics to the statistical classes themselves. Additionally, he details what he believes are the four shortcomings of statistical courses for school administrators.

- The classes do not emphasize the relevance of statistics to the day-to-day lives of principals and teachers.
- The classes do not fully integrate current technology into the teaching and learning of statistics.
- The classes are not designed for students enrolled in education leadership.
- The classes focus on inferential statistics as a toll for conducting research projects and dissertations. (p. 52-53)

"Far less time is spent on statistical strategies that might help principals improve their skills in problem analysis, program and student evaluation, data-based decision making, and report preparation" (p. 53).

"In 2003, the nonpartisan research organization, Public Agenda, reported that today's school superintendents want their principals to display prowess in everything from accountability to instructional leadership and teacher quality, but principals themselves don't think they are equipped for these duties" (Hess & Kelly, 2005, p. 35). Hess and Kelly (2005) explain that two thirds of current principals surveyed report that leadership programs in graduate schools of education are out of touch with what principals need to know. After studying the syllabi of many graduate programs, Arthur Levine, president of Teachers College at Columbia University, stated that the majority of educational administration programs ranged from inadequate to appalling. "Principals receive limited training in the use of data, research, technology, the hiring or termination of personnel, or using data to evaluate personnel in a systemic way" (p. 40).

"Based on responses from 30 universities across the United States, less than 30% of principal preparation programs are preparing candidates to be data-driven decision-makers" (Grigsby & Vesey, 2011, p. 18). This is part of the conclusion drawn from Grigsby and Vesey (2011) after studying 40 educational administrative graduate programs. The methodology of the study included studying four components of the Course Syllabi from the respective programs: course objectives, classroom sessions, resources, and activities. The study produced four recommendations for Principal Preparation Programs:

- Align professional standards with each course in the program by developing a new curriculum framework and new courses aimed at producing leaders who can collect, interpret, and analyze school data focusing on continuous school improvement (SREB, 2005).
- Provide more authentic coursework and field experiences in all courses that pertain to data analysis and informed decision making for improved student achievement. For example, in a graduate curriculum course, have students analyze performance data from their campus and make recommendations for improvements. In a graduate statistics course, teach candidates to "improve skills in problem analysis, program and student evaluation, data-based decision-making, and report preparation" (Creighton, 2001, p. 53).
- Provide leadership academies for students once they become principals. This provides continuous professional development for students in the area of data analysis and informed decision-making.

- Develop partnerships between universities and local school districts in order for candidates to experience hands-on activities in which investigation of assessment data are used, and candidates work to find solutions. (p. 27)

The end result for aspiring principals who attend a graduate principal preparation program which does not prepare them for statistical work with data is that they will lack some of the critical skills and behaviors which would enable them to utilize DDDM. "This lack of technical skills likely hinders most educators' abilities to both physically work with data and make valid interpretations of data" (Knapp et al., 2006, p. 37).

Technology itself has also been cited in the literature as a barrier to DDDM. As cited in Wayman (2005),

> State educational agencies, school districts, and other educational entities have collected and stored large amounts of student data for years. Despite this abundance, the employment of data to inform and improve educational practice has been the exception rather than the rule. In previous work, my colleagues and I have argued that one major barrier to the use of student data has been technical. (Wayman, Stringfield, & Yakimowski, 2004)

Wayman (2005) addresses this barrier when he states,

> Although schools have been "data rich" for years, they were also "information poor" because the vast amounts of available data they had were often stored in ways that were inaccessible to most practitioners. Recently emerging technology is changing these circumstances. Computer

> tools have arrived on the market that provide fast, efficient organization and delivery of data. They also offer user-friendly interfaces that allow data analysis and presentation by all users, regardless of technological experience. (p. 296)

State Report Card Achievement Indicators

Three items from the South Carolina Annual School Report Card were chosen to correlate with the principals' level of DDDM as determined by the researcher, based on the respondents' self-reported behaviors of DDDM:

a. Percent of students who pass their EOC test(s) in grades 8-12
b. Percent of students in Math and English/Language Arts scoring Met & Exemplary on the South Carolina PASS Examination in grades 6-8
c. Percent of students scoring proficient and exceptional in Math and English/Language Arts on the HSAP Assessment in grade 10

> The state's Education Accountability Act of 1998, Section 59-18-100, included as a purpose of the system "to provide an annual report card with a performance indicator system that is logical, reasonable, fair, challenging, and technically defensible which furnishes clear and specific information about school and district academic performance and other performance to parents and the public." The report card contains AYP determinations for all public schools and districts. (The state's Education Accountability Act of 1998, Section 59-18-100)

The assessments of PASS, HSAP, and EOC were utilized as indicators of student achievement. The PASS assessment is a criterion referenced test administered to students in grades 3-8 in South Carolina. The PASS test contains ELA, Math, Science, Social Studies, and Writing sections. The scoring categories are: Not Met 1, Not Met 2, Met, Exemplary 4, and Exemplary 5. The HSAP assessment is a criterion-referenced test given to students in their second year of high school in South Carolina. If the students are not successful, they will have four additional opportunities to pass the test. The testing sections include ELA and Math. The scoring categories for the HSAP assessment are:

> Achievement Level 4: The Level 4 student has demonstrated an *exceptional* command of skills and knowledge required of high school students in South Carolina.
>
> Achievement Level 3: The Level 3 student has demonstrated *proficiency* in skills and knowledge required of high school students in South Carolina.
>
> Achievement Level 2: The Level 2 student has demonstrated *competence* in skills and knowledge required of high school students in South Carolina.
>
> Achievement Level 1: The Level 1 student *has not demonstrated competence* in the skills and knowledge required of high school students in South Carolina.

The EOC assessment is a criterion-referenced test given to students at the end of selected high school courses. The courses in South Carolina which require an EOC assessment are Algebra 1, English 1, U.S. History, and Biology 1. The exam determines 20% of the students' course grade. The scoring is comprised of a numerical grade ranging from 0 to 100. (South Carolina Department of Education Retrieved from http://www.ed.sc.gov/)

The Principals' Role

> DDDM is a popular concept in education reform that can mean many things, but there is little rigorous research to test its efficacy for improving student achievement. Most of the research on DDDM in schools consists of case studies about small numbers of schools or districts or surveys that include larger numbers of participants but that provide only suggestive evidence about how DDDM affects student achievement. (Schwartz & Hamilton, 2013, p. 1)

This study is an attempt to address this gap within the academic research and will seek to examine whether a data-driven principal can positively affect student achievement. The researcher agrees with Creighton (2001) who has written several articles on data-driven leaders. "Data driven decision making is a hallmark of good instructional leadership. Principals and teachers can learn to maneuver through the statistical data to help create goals and strategies for change and improvement" (Creighton, 2001, p. 52).

At the heart of a strong, effective data-driven culture is a strong data-driven leader.

> Data-driven decision making goes well beyond simply complying with NCLB performance requirements. It can serve as a powerful process for districts to facilitate more informed decision making, boost overall school performance and improve student achievement. Key to successful implementation of data-driven decision making is an outspoken leader who understands the vision, champions the cause and helps others in the district realize the impact of data analysis. (Messelt, 2004, p. 25)

Before proceeding to the summary of this literature review, the researcher acknowledges that this literature review has been based upon the historical context and associated research and literature from a United States perspective. It is important to note that the issues of DDDM are also occurring on a world-wide stage. In 2013 three prominent international researchers of (DDDM), Kim Schildkamp, Mei Kuin Lai, and Lorna Earl, collaborated to bring together the research conducted on data use across multiple countries. In their introduction they state:

> School leaders and teachers are increasingly required to use data as the basis for their decisions. This requirement is part of a growing international focus on holding schools more and more accountable for the education they provide and on promising evidence that data-based decision making can result in improvements in student achievement. (Schildkamp et al., 2013, p. 9)

Summary

DDDM and leadership have been a part of school leadership since the inception of public schools. The level, quality, and mechanisms have changed over time as a result of major paradigm shifts in the business world and as a function of educational laws. The No Child Left Behind Act of 2001 has had the most drastic effect on (DDDM). NCLB caused school administrators to collect and analyze data in a manner and amount that had not existed prior to NCLB. The research indicates that the role of the principal has changed in the last thirty years from a manager to a real instructional leader who needs the skills necessary to be a data-driven leader. The research also sheds doubt on whether the principal preparation programs have adapted to provide these necessary data-driven decision skills and knowledge. This study examined the degree to which selected principals from the Charleston area of South Carolina assessed themselves as being data-driven. Additionally, the study examined the degree to which the principal respondents reported using critical DDDM skills and whether there exists a relationship with the use of these skills and student achievement as measured by the aforementioned specific items on the state report card.

CHAPTER 3

METHODOLOGY

This chapter examines the research design and methodology used in this study to investigate the principal respondents' self-assessed level of being data-driven, their self-reported use of identified data-driven principal behaviors, and whether there exists any significant relationships between the use of these skills and student achievement as indicated on their respective state report cards. The researcher acknowledges that there are many variables involved in student achievement, and isolating the variable of DDDM to increased student achievement is a difficult analysis. This point is well stated by Knapp (2006), a leading proponent of DDDM.

> While it is not possible from such research to isolate the effect of data-based decision making on learning outcomes, it is clearly plausible that, as part of a syndrome of learning-focused leadership activity, this facet of leadership makes a contribution to the improvement of performance. (p. 37)

This chapter includes information on the following topics: research questions, research design, quantitative research, population, procedures, instrumentation, validity and reliability, data analysis, limitations, and concludes with a summary. As stated in prior chapters, the purpose of this study was to add clarity to the concept of DDDM, define the behaviors which would identify a principal as being a data-driven principal,

and explore any relationships with the use of DDDM behaviors and student achievement variables from the respective state report card values. In addition, principals who desire to become more data-driven can incorporate the identified behaviors in this study to work toward this goal. The following questions guided this research study:

Research Questions:

1. To what degree do current school principals in select districts from the Charleston area of South Carolina see themselves as data-driven leaders?

2. To what extent are the 12 specific behaviors that define a data driven principal, as self-reported, present in these principals?

3. To what extent is there a relationship between the data-driven level of the principals and:

a. Percent of students who pass their End of Course (EOC) test(s) in Grades 8-12

b. Percent of students in Math and English/Language Arts scoring Met and Exemplary on the Palmetto Assessment of State Standards (PASS) in Grades 6-8

c. Percent of students who score Proficient and Advanced on the High School Assessment Program (HSAP) Assessment in Grade 10

Research Design

This study addressed DDDM, its associated behaviors, the degree to which current principals assessed themselves as being data-driven, and the degree to which principals self-reported their use of identified DDDM behaviors. Next, this level of the

use of DDDM behaviors was correlated against several key values on the state report card. This research was best accomplished with a quantitative research methodology.

> The quantitative researcher views human behavior as predictable and measurable while the qualitative researcher sees human behavior as dynamic, contextual, and personal. The quantitative researcher is interested in supporting general laws and collects data as evidence to describe, explain and predict based on the laws related to specific hypotheses under study. The qualitative researcher's approach is broad like that of an explorer who digs deeply into phenomena to discover, construct and describe what was encountered from the local or particular groups of people. (Johnson & Christensen, 2008, p. 34)

Johnson and Christensen (2008) continue this discussion of comparing the quantitative versus qualitative study approaches and when to utilize one or the other.

> In testing specific laws and hypotheses, the quantitative researcher uses lab-like conditions to study the subjects in controlled conditions attempting to isolate the cause and effect while eliminating unknown or unpredictable variables… For the quantitative researcher data collected is objective and variables can be identified, quantified, justified and supported by other researchers. (p. 34)

For this study, the statistical mathematical method of correlation, specifically a Pearson Correlation, within the quantitative work is important. In this study the researcher is investigating the relationship between the degree of use of DDDM behaviors and student achievement. Towards this end, the quantitative method of study is the most appropriate.

Quantitative Research

In this study, the quantitative data was generated from an on-line survey. In his book *Doing Quantitative Research in Education with SPSS,* Muijs (2011) discusses the major advantages of using an on-line survey research design. The specific advantages he expounds on are low cost, quick response time, answers can be stored in a data-base, and the on-line surveys allow simple analysis to take place. "It is also easy to guarantee the respondents' anonymity, which may lead to more candid answers than less anonymous methods such as interviews" (p. 39).

Equally important to understanding the major advantages of online surveys is to understand and plan for the potential weaknesses of this research study design. In an article written in 2005 entitled *The Value of Online Surveys,* Evans and Mathur (2005) elaborate on the weaknesses of online surveys. Potential major weaknesses discussed included "perception as junk mail," "respondent lack of online experience/expertise," "technological variations and technology problems," "unclear answering instructions," "impersonal, privacy and security issues," and "low response rate" (p. 201-202). The researcher has considered these potential weaknesses and has proactively guarded against them with the research study instrument and method of dissemination.

The survey was a cross-sectional on-line survey. The researcher utilized the on-line company SurveyMonkey to disseminate the survey. The technological aspect of being on-line made the delivery of the survey convenient for both the researcher and the respondents. The survey contained twenty-seven questions. The survey was purposefully created to be very brief in hopes that busy administrators would be more likely to respond, thus increasing the return rate. Another advantage to the on-line nature

of the survey was that the informed consent for the respondents was able to be included within the language of the invitation e-mail sent to the recipients. The researcher made clear that the identity of the respondents and their schools would not be utilized within the research paper.

Population

The sample population used for this study were 169 principals from five school districts in the Charleston, South Carolina area. The school districts were: Aiken School District, Berkeley County School District, Charleston County School District, Dorchester District 2 and Dorchester District 4. The five districts were chosen as a matter of convenience for the researcher. Principals in these districts who had students in grade three or higher were invited to participate.

Procedures

The study entitled *Data-Driven School Administrator Behaviors* was first sent to The University of South Carolina Institutional Review Board for review on November 19, 2013, and was approved on November 26, 2013.

The researcher obtained the 169 potential principal respondents names and e-mails from the respective districts' internet web-sites. In addition, school web-sites were viewed to ensure the accuracy of the principals' name as well as their respective e-mail address.

On December 2, 2013, e-mails were sent to 169 potential participants to inform them of and invite them to complete the on-line survey which would be sent to them by

way of e-mail later in the day (Appendix A). Eleven of the e-mails were returned because they were undeliverable. The researcher called the respective schools and clarified the e-mail addresses. An e-mail was then resent to those 11 potential participants. This was an important step for two reasons. 1) This forewarned the potential participants that a survey was to be expected later in the day, and since the e-mail was generated from the researcher's school e-mail account, the respondents knew the researcher was a local principal colleague and thus should have increased the response rate. 2) By sending out this e-mail, the researcher knew that the 169 identified e-mail addresses were accurate and now ready to be uploaded to the SurveyMonky software.

The survey was first sent out to the 169 potential principal respondents on December 2, 2013 (Appendix B). The e-mail contained a hyperlink to the actual survey. In addition, the message stated that the potential respondents' names and school identities would not be used in the research. And finally, there was a link in the message which the potential respondents could click on to be removed from any future SurveyMonkey mailing list. By the morning of December 4, 2013, 56 principals had completed the survey and 8 principals had opted out of the survey. Late in the day on December 4, a reminder e-mail with a link to the survey was sent to the 105 principals who had not yet responded (Appendix C). Through the next two days, 19 additional principals responded bringing the total respondent count to 83 or 49% of the invited principals. On December 6, 2013, a final request e-mail to complete the survey was sent to the 86 principals who had not yet responded to the invitations (Appendix D). This last invitation resulted in an

additional 13 completed surveys which brought the total respondent count to 96 principals and a final return rate of 56.8 %.

Instrumentation

The survey instrument used in this study was based in part upon the published survey entitled *Principal Data-Driven Decision Making Index* (P3DMI) published by Childress and Luo in 2009. Their instrument measured a principal's use of DDDM in four domains: school instruction, school organizational operation and moral perspective, school vision, and collaborative partnerships and politics. The survey developed by the researcher for this study retained at least two questions from each of the four domains from the 2009 P3DMI. The retained questions were:

Leadership in School Vision:

I use data to make decisions in aligning resources with the school vision.

I use data to define possible problems in vision implementation.

Leadership in School Instruction:

I use data to identify problems in student learning.

I use data to make recommendations regarding student learning.

Leadership in School Organizational Operation and Moral Perspective:

I use data to promote an environment for improved student achievement.

I use data to judge my performance in effective management.

Leadership in Collaborative Partnerships and Larger-Context Politics:

I use data to develop effective communications plans.

I use data to develop effective approaches for school-family partnership.

The response choices for these eight questions from the P3DMI were: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, and 5 = *strongly agree*. In addition to the questions from the P3DMI, the researcher added ten demographic questions to describe the principal respondents:

- In which district is your school located?
- What is the name of your school?
- What level is your school?
- How many students attend your school?
- What is the free and reduced lunch percentage (added together) in your school?
- What is your age bracket?
- What is your gender?
- How many years have you served as a school principal?
- How many years have you served as the principal at your current school?

Ten questions designed to understand the respondent principals and their relationship to DDDM were also included:

- What is the highest degree you have earned?
- How many statistics classes have you taken?
- Who completes the majority of statistical work in your school?
- How often do you do statistical work related to student data?
- Which form of data do you use the most often?
- Which data tasks have you completed this year?

- Which test data have you reviewed this year?
- Would you like to learn additional skills to become more data-driven?
- How data-driven do you consider yourself?
- In the future, do you believe being data-driven will become more or less necessary as an instructional leader?

The on-line survey used in this study had a total of twenty-seven questions (Appendix E). Additional questions would have generated additional data and information, but the researcher made a strong effort to reduce the overall number of questions in an effort to increase the respondent completion and return rate. In speaking with several colleagues, the time-frame to stay within for busy principals was under fifteen minutes. Many colleagues stated that they preview surveys they receive and usually only respond to those that can be completed within a fifteen minute time-frame.

Validity and Reliability

Joppe (2000), as cited by Golafshani (2003), provides the following explanation of what validity is within quantitative research:

> Validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are. In other words, does the research instrument allow you to hit "the bull's eye" of your research object? Researchers generally determine validity by asking a series of questions, and will often look for the answers in the research of others. (p. 599)

In an effort to increase validity, six principals in Berkeley County were selected to pilot the survey instrument for this study. The researcher asked for feedback with respect to survey length, clarity of directions and questions, and ease of technology. Only minor word changes were made in two of the survey questions based upon their input.

"In an effort to bolster validity, you should ensure that all relevant topics have been included in the survey (given your resources)" (Fink, 2009, p. 44). The researcher made a conscientious effort to include necessary topics on the survey, especially demographic variables, while at the same time limiting the survey to maximize the respondent return rate to the point at which it could be completed in less than fifteen minutes.

"Reliability is a statistical measure of how reproducible the survey instrument's data are" (Litwin, 1995, p. 6). "Reliability is commonly assessed in three forms: test-retest, alternate form, and internal consistency" (Litwin, 1995, p. 8). "Test-retest reliability is the most commonly used indicator of survey instrument reliability. It is measured by having the same set of respondents complete a survey at two different points of time to see how stable the responses are" (Litwin, 1995, p. 8). To test the reliability of the instrument that the researcher had developed, the researcher employed the test-retest methodology to check the reliability. The same six principals who piloted the survey retook the survey seven days later. From the six respondents who each answered all twenty-seven questions, there were only three response changes made from their original responses. Employing the test-retest reliability analysis yielded a correlation coefficient of greater than .90 which was very high. "In general, r values are considered good if they equal or exceed 0.70" (Litwin, 1995, p. 8).

Data Analysis

The survey instrument was electronically disseminated December 2 through December 6, 2013. The survey was closed on December 8, 2013. The results from the survey entitled *Data-Driven School Administrator Behaviors* were exported from SurveyMonkey and inserted into Microsoft Excel. The statistical software package entitled ANALIZE-IT was added to Microsoft Excel and was used to analyze the raw data.

The survey results were first analyzed using descriptive statistics to determine *Response Percentage* and *Frequency*. The results from this analysis were depicted in Chapter Four with the use of tables and histograms. Histograms were used when the researcher wanted to visually show the distribution or variability of the data. This data analysis methodology was used to answer research questions 1 and 2.

Research Questions 1 and 2 were:

1. To what degree do current school principals in select districts from the Charleston area of South Carolina see themselves as data-driven leaders?

2. To what extent are the 12 specific behaviors that define a data driven principal, as self-reported, present in these principals?

To answer research question number 3, the researcher used the *Pearson Correlation* statistical procedure. Again the technologies of Microsoft Excel and Analyze-It were used for the statistical analysis. The respondents' self-reported use of DDDM skills was exported from question number 23 from the survey entitled *Data-Driven School Administrator Behaviors* housed in SurveyMonkey. The respondents' academic variable

data was obtained from their respective State Report Cards which were available on-line at (http://www.ed.sc.gov). The researcher chose to compute the Pearson Correlations using a 95% Fisher confidence interval. Pearson Correlation best fit scatter plot graphs were depicted in the chapter 4 results. The Pearson Correlation r values were reported in Chapter Four with the use of a table.

Research question 3 was:

To what extent is there a relationship between the data-driven level of the principals and:

a. Percent of students who pass their End of Course (EOC) test(s) in Grades 8-12

b. Percent of students in Math and English/Language Arts scoring Met and Exemplary on the Palmetto Assessment of State Standards (PASS) in Grades 6-8

c. Percent of students who score Proficient and Advanced on the High School Assessment Program (HSAP) Assessment in Grade 10

Limitations

This study was limited to a relatively small geographic area near Charleston, South Carolina. Therefore, both the findings and the generalizations emanating from the results may be limited. In addition, the scope of the material within the survey instrument itself has had a limiting affect upon the subject under study. (DDDM) has become a vast subject since the implementation of the No Child Left Behind legislation. In order to obtain meaningful information, the scope of studies with this topic must be limited.

Summary

Chapter Three of this dissertation discussed the methodology and the associated procedures used to conduct this research of principals in the Charleston, South Carolina neighboring school districts with respect to DDDM and student achievement. This chapter included discussions of research questions, research design, quantitative research, population, procedures, instrumentation, validity and reliability, data analysis, and limitations. The study method and design chosen for this research provided an efficient and accurate methodology to add to the current understanding of the skills and behaviors associated with DDDM as well as adding to the discussion of whether DDDM has a positive effect upon student learning and achievement. Chapter Four presents the findings of this research study.

CHAPTER 4

RESULTS

The purpose of this chapter is to present and analyze the findings of this research study. The overall purpose of the research was to add to the current understanding of the behaviors which describe a school principal as being data-driven as well as to examine relationships between the principals' self-assessed use of DDDM behaviors and student achievement. This research study utilized a quantitative methodology of study to answer the following research questions:

1. To what degree do current school principals in select districts from the Charleston area of South Carolina see themselves as data-driven leaders?

2. To what extent are the 12 specific behaviors that define a data driven principal, as self-reported, present in these principals?

3. To what extent is there a relationship between the data-driven level of the principals and:

   a. Percent of students who pass their End of Course (EOC) test(s) in Grades 8-12

   b. Percent of students in Math and English/Language Arts scoring Met & Exemplary on the Palmetto Assessment of State Standards (PASS) in Grades 6-8

c. Percent of students who score Proficient & Advanced on the High School Assessment Program (HSAP) Assessment in Grade 10

The quantitative results presented in this study are based on the responses from 96 current principals who responded to a 27 question on-line survey. The principals serve in the following South Carolina School Districts: Aiken County School District, Berkeley County School District, Charleston County School District, Dorchester District Two, and Dorchester District Four. In addition, information from the respective South Carolina State School Reports Cards was utilized for quantitative analysis.

Quantitative Findings

There are currently 169 principals in the aforementioned school districts who have grade structures which include grade three or higher. All of these principals were invited to participate in the on-line survey. Ninety-six of these principals, or 56.8%, participated in the study. The on-line survey results are presented in tables and, in some cases, histograms to display the information. Both tables and histograms are accompanied by explanations to provide clarity and important findings.

Demographic Information

Table 4.1 and Figure 4.1 indicate the age ranges of the respondents. The age range was from 31 to 70. The majority of the principals were in the collective age range of 36 to 55 and accounted for 75.5% of the respondents. The response percentage

dropped sharply in ages under 36 and over 61. Figure 4.1 shows the shape of the data distribution. The National Center for Education Statistics reports that the average age for a public school principal in the United States is 49.3, and for South Carolina the average age is 49.0. Interestingly, the average age for some states is as low as 46.2 (Kentucky) and as high as 53.9 (District of Columbia).

Table 4.1

Age of Principals

Age Groups	Response Percentage	Frequency*
25-30	0.0	0
31-35	5.32	5
36-40	19.15	18
41-45	18.09	17
46-50	18.09	17
51-55	20.21	19
56-60	9.57	9
61-65	7.45	7
66-70	2.13	2

*N = 94

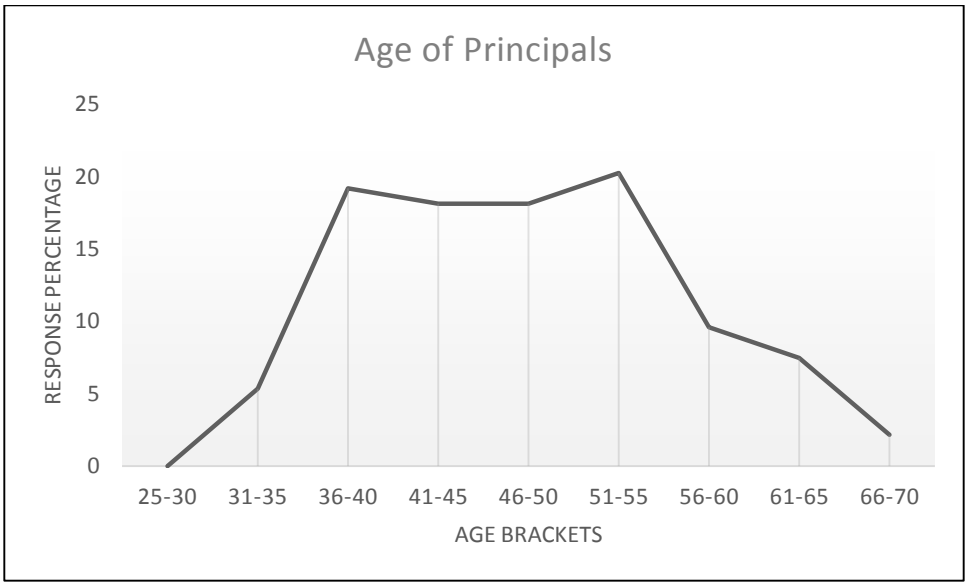

Figure 4.1 Age of Principals in the Survey

Table 4.2 and Figure 4.2 indicate the total years of experience as a principal. Table 4.2 shows that the largest bracket is 2-4 years of experience, and the second highest bracket is over 10 years of experience. Figure 4.2 depicts the shape and distribution of the data. The National Center for Education Statistics reports that the average years of experience as a public school principal in the United States is 7.5 years. It is important to note that Table 4.2 tells us that 78% of the principals in this study started their initial principalship after No Child Left Behind was enacted in 2002. Also noteworthy is that 49.5% of the principals in this study have less than 4 years of experience as a principal.

Table 4.2

Principals' Total Years of Experience as a Principal

Years as a Principal	Response Percentage	Frequency*
0-1	14.74	14
2-4	34.74	33
5-7	18.95	18
8-10	9.47	9
Over 10 years	22.11	21

*N = 95

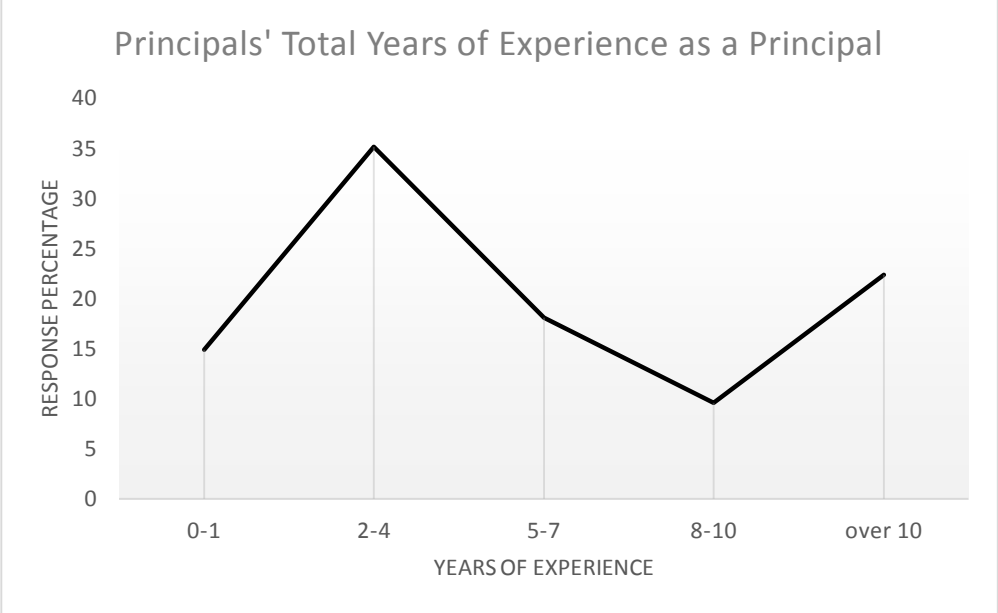

Figure 4.2 Principals' Years of Experience

Table 4.3 and Figure 4.3 depict the respondents' years of service at their present principal position. According to the data, 82% of the respondents have been in their

present position for less than seven years, and 64% of the respondents have less than four years of experience as a principal in their current position.

Table 4.3

Principals' Total Years at Current School

Years as a Principal	Response Percentage	Frequency*
0-1	21.28	20
2-4	42.55	40
5-7	18.09	17
8-10	5.32	5
Over 10 years	12.77	12

*N = 94

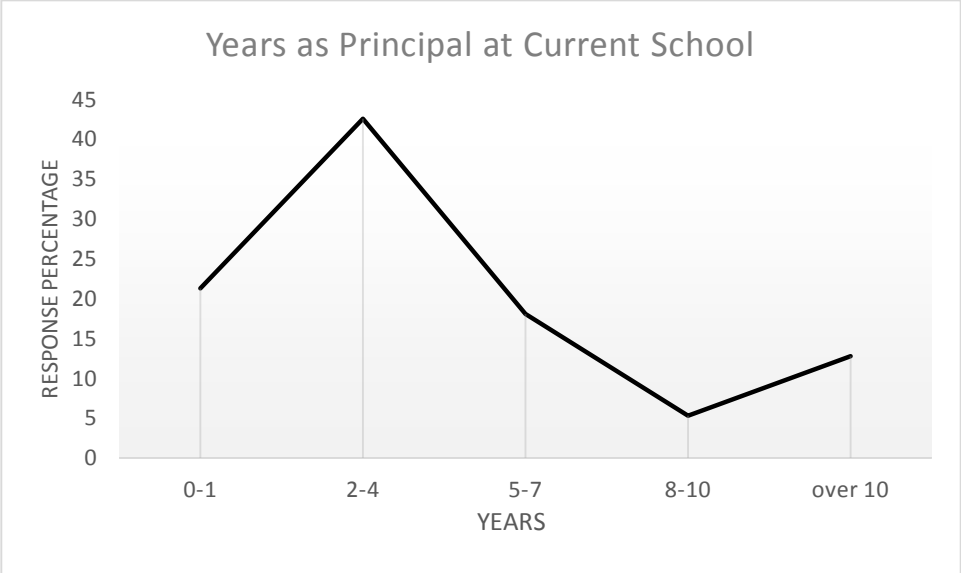

Figure 4.3 Years as Principal at Current School

Table 4.4 depicts the gender distribution of the principals in the survey group. Sixty-six percent of the respondents are female. The National Center for Education

Statistics reports that 47.6% of the public school principals in the United States are female, and 52.4% are male. Additionally, they report that in South Carolina 42.0% of the principals are male, and 58.0% are female. The fact that this respondent group is 66% female could account for the lower than expected years of experience as a principal (as depicted in Figure 4.2) because some women postpone their professional careers for a number of years to raise children.

Table 4.4

Principals' Gender

Gender	Response Percentage	Frequency*
Female	65.96	62
Male	34.04	32

*N = 94

The 96 principal respondents represent schools of varying size and socio-economic levels. Table 4.5 depicts the data with respect to school size. The response percentage and frequency with respect to school sizes within this study are contained in Table 4.5. Figure 4.4 visually shows a relatively even distribution of the size of the schools within this study. The smallest category consists of schools with less than 300 students or 14% of the respondents. The largest group was a school size of 501-750 with 25% of the respondents.

Table 4.5

Size of School

School Sizes	Response Percentage	Frequency*
Less than 300	13.83	13
301-500	20.21	19
501-750	24.47	23
751-1000	19.15	18
Over 1000	22.34	21

*N = 94

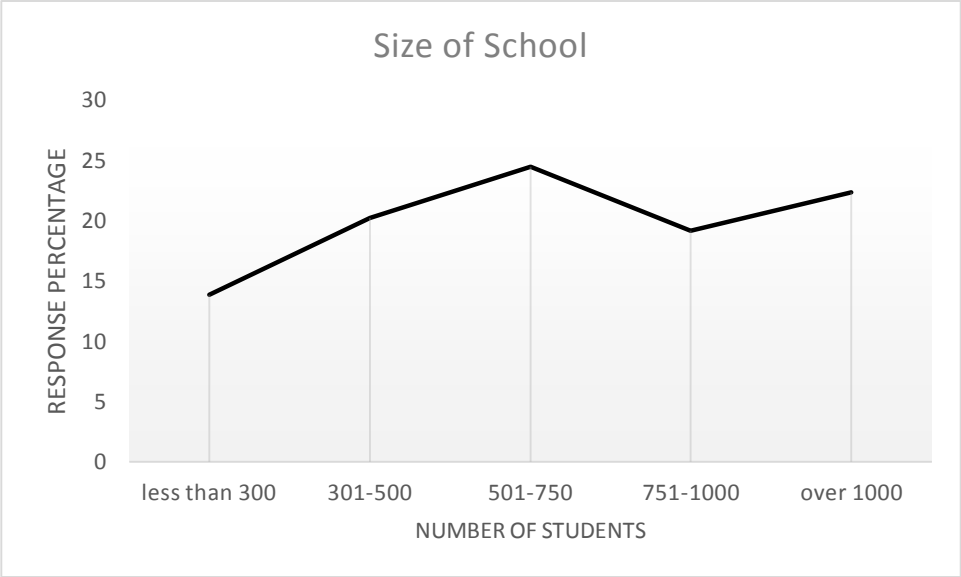

Figure 4.4 Size of School

Socio-economic levels of the schools are depicted in Table 4.6 and Figure 4.5. Figure 4.5 visually shows that the highest percent of free and reduced schools are in the 41 to 60% free and reduced range. The histogram does not show an even distribution of the data. The histogram shows a positive skew toward the higher end of the free and

reduced value. An aggregate of the ranges 61-75, 76-90, and 91-100 represents a disproportionate 52% of the respondents.

Table 4.6

Percent of Free and Reduced Students

Free & Reduced Percent	Response Percentage	Frequency*
0-10	1.08	1
11-25	10.75	10
26-40	9.68	9
41-60	26.88	25
61-75	15.05	14
76-90	23.66	22
91-100	12.90	12

*N = 93

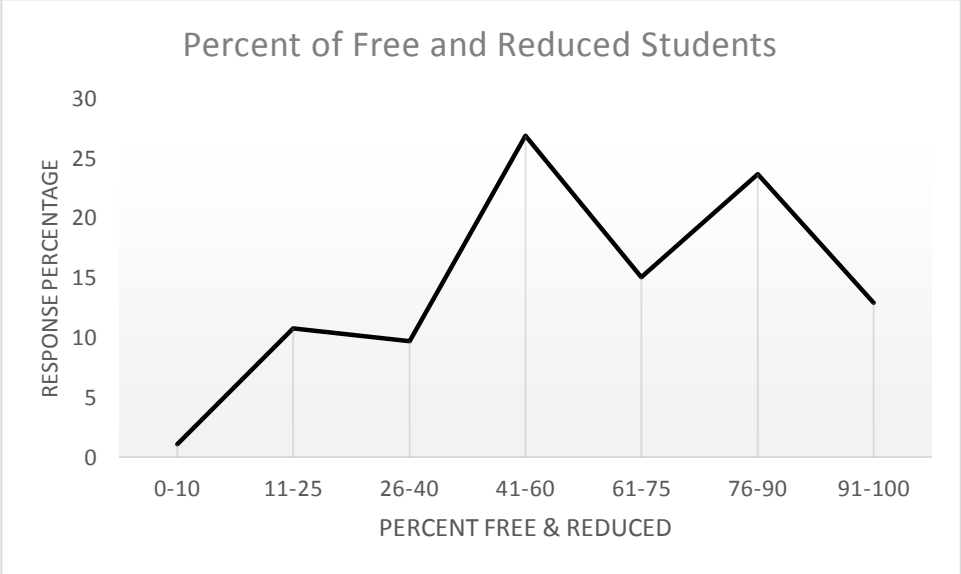

Figure 4.5 Socio-Economic Level of Students

Description of Respondents

Table 4.7 looks at the educational level of the principal respondents. Sixty-three percent of the respondents indicated that their highest degree earned was a Master's Degree. Only 14.89% of the principals had a Doctoral Degree.

Table 4.7

Educational Level of Respondents

Educational Level	Response Percentage	Frequency*
Masters	62.77	59
Ed.S.	22.34	21
Doctoral	14.89	14

*N = 94

Table 4.8 and Figure 4.6 display the data with respect to the number of statistic courses completed during the respondents' undergraduate and graduate school programs. The data indicates that 71% of the respondents have taken two or less statistics classes. Conversely, only 16% of the respondents have taken more than three statistics classes.

Table 4.8

Number of Statistics Classes Completed

Number of Classes	Response Percentage	Frequency*
None	4.26	4
1	31.91	30
2	35.11	33
3	12.77	12
More than 3	15.95	15

*N = 94

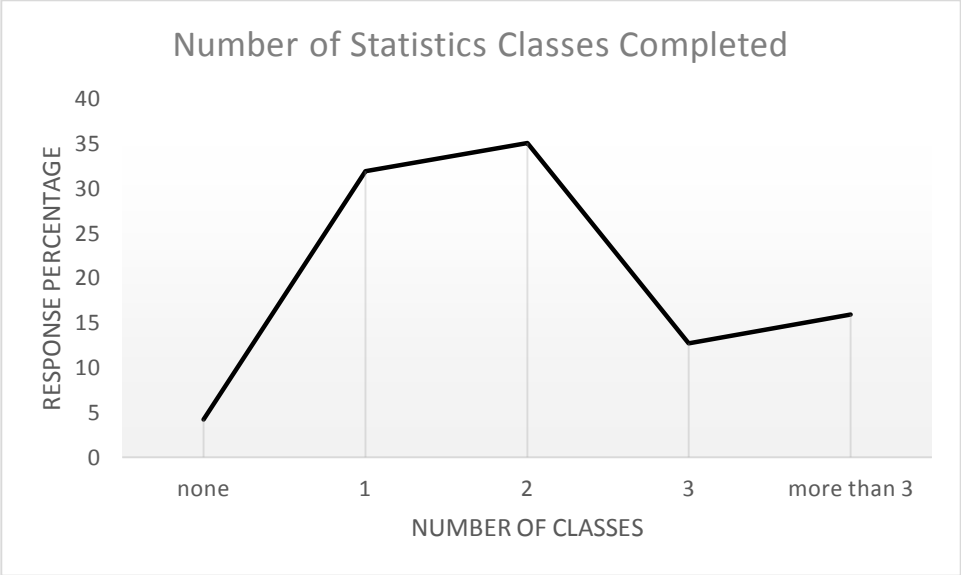

Figure 4.6 Number of Statistics Classes Completed

Survey question 12 (Appendix E) asked, *Who completes the majority of the statistical work in your school?* The respondents responded with the results shown in Table 4.9. Sixty-two percent of the principals responded that they were the ones in their schools who complete the statistical work. The second highest group was Other at 22.34% and then Assistant Principal at 11.70%.

Table 4.9

Who Completes the Statistical Work in Your School?

Employee	Response Percentage	Frequency*
Principal	61.70	57
Assistant Principal	11.70	11
Guidance Staff	2.13	2
Teachers	2.13	2
Clerical Staff	0.0	0
Other	22.34	21

*N = 93

In an effort to examine the respondents' behavior and skills associated with DDDM, the respondents were asked to report how often they were involved in statistical work. Table 4.10 depicts their responses. Figure 4.7 shows that the distribution of the data is not evenly distributed. For example, 73% of the respondents do statistical work between once a week and once a month. In contrast, only seven percent of the respondents do statistical work on a daily basis.

Table 4.10

How Often do You do Statistical Work?

Time Element	Response Percentage	Frequency*
Every Day	7.45	7
3-5 times a week	17.02	16
1-2 times a week	41.49	39
Once a month	31.91	30
Once a semester	2.13	2
Once a school year	0.0	0

*N = 94

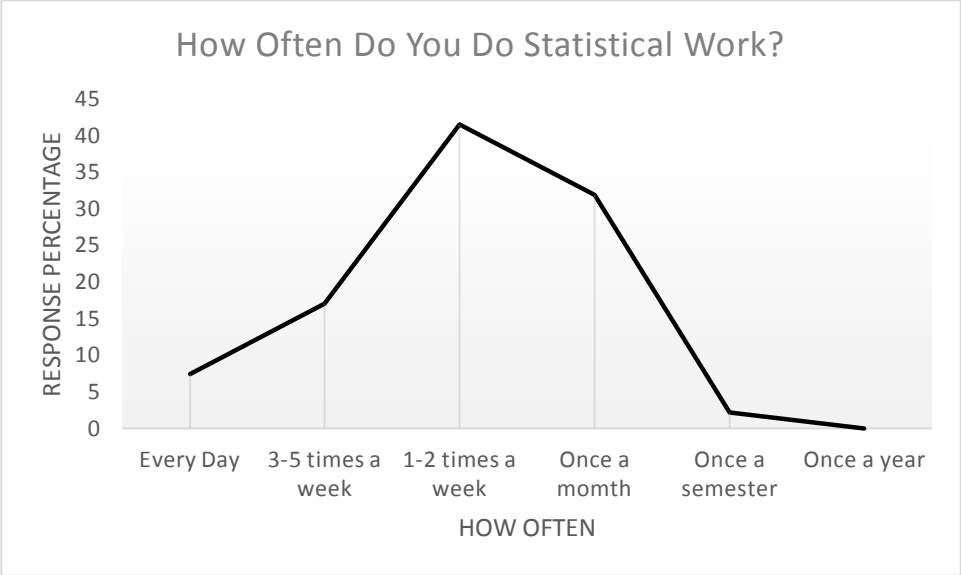

Figure 4.7 How Often Do You Do Statistical Work?

Self-Assessment of Data-Driven Level

Research question 1 asked, *To what degree do current school principals in select districts from the Charleston area of South Carolina see themselves as data-driven leaders*? Table 4.11 and Figure 4.8 depict the principals self-assessed data-driven level. Sixty-three percent of the respondents rated their level of being data-driven as an 8, 9, or 10 on a scale of 1 to 10 with 1 being the lowest. Figure 4.8 shows the tremendous positive skew as the respondents rated themselves very high on their level of being data-driven. Only 3 percent of the respondents rated themselves as a 1 to 4 on this scale.

Table 4.11

How Data-Driven Are You?

Level Range = 1-10 (1 is the lowest)	Response Percentage	Frequency*
1	0.0	0
2	1.06	1
3	0.0	0
4	2.13	2
5	6.38	6
6	9.57	9
7	18.09	17
8	38.30	36
9	17.02	16
10	7.45	7

*N = 94

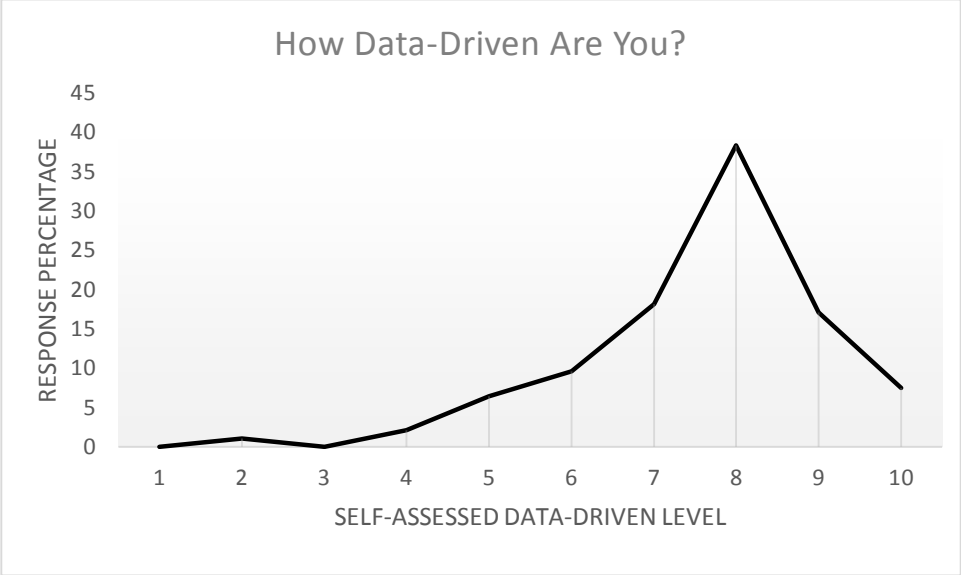

Figure 4.8 Self-Assessed Data-Driven Level

Principal Data-Driven Decision Making Index

The next eight questions from the survey were obtained from the *Principal Data-Driven Decision Making Index* (P3DMI) published by Childress and Luo in 2009. The questions were designed to measure the areas where principals showed strengths as data-driven leaders. Four domains of leadership were analyzed with these questions: Leadership in School Vision, Leadership in School Instruction, Leadership in School Organizational Operation and Moral Perspective, and Leadership in Collaborative Partnerships and Larger-Context Politics. The response choices from these questions ranged from *strongly disagree* with a value of (1), disagree (2), *neutral* (3), *agree* (4), to *strongly agree* with a value of (5). The highest domain area was Leadership in School Instruction with a mean of 4.58 *(SD=0.85),* followed by School Vision with a mean of 4.35 *(SD=0.84),* next was School Organization with a mean of 4.35 *(SD=0.87),* and finally Leadership in Collaborative Partnerships with a mean of 4.01 *(SD=0.88)*. The individual question results are depicted in Table 4.11 thru Table 4.18.

Table 4.12

I use Data to Make Decisions in Aligning Recourses with the School Vision

	Response Percentage	Frequency*
Strongly Disagree	4.21	4
Disagree	0.0	0
Neutral	2.11	2
Agree	35.79	34
Strongly Agree	57.89	55

*N = 95

Table 4.13

I use Data to Define Possible Problems in Vision Implementation

	Response Percentage	Frequency*
Strongly Disagree	2.13	2
Disagree	0.0	0
Neutral	7.45	7
Agree	50.0	47
Strongly Agree	40.43	38

*N = 94

Table 4.14

I use Data to Identify Problems in Student Learning

	Response Percentage	Frequency*
Strongly Disagree	4.26	4
Disagree	0.0	0
Neutral	1.06	1
Agree	24.47	23
Strongly Agree	70.21	66

*N = 94

Table 4.15

I use Data to Make Recommendations Regarding Student Learning

	Response Percentage	Frequency*
Strongly Disagree	3.23	3
Disagree	0.0	0
Neutral	1.08	1
Agree	24.73	23
Strongly Agree	70.97	66

*N = 93

Table 4.16

I use Data to Promote an Environment for Improved Student Achievement

	Response Percentage	Frequency*
Strongly Disagree	3.19	3
Disagree	0.0	0
Neutral	2.13	2
Agree	28.72	27
Strongly Agree	65.96	62

*N = 94

Table 4.17

I use Data to Judge my Performance in Effective Management

	Response Percentage	Frequency*
Strongly Disagree	3.16	3
Disagree	1.05	1
Neutral	9.47	9
Agree	50.53	48
Strongly Agree	35.79	34

*N = 95

Table 4.18

I use Data to Develop Effective Communication Plans

	Response Percentage	Frequency*
Strongly Disagree	2.11	2
Disagree	2.11	2
Neutral	14.74	14
Agree	49.47	47
Strongly Agree	31.58	30

*N = 95

Table 4.19

I use Data to Develop Effective Approaches for School-Family Partnership

	Response Percentage	Frequency*
Strongly Disagree	3.23	3
Disagree	2.15	2
Neutral	16.13	15
Agree	52.69	49
Strongly Agree	25.81	24

*N = 93

The next descriptive question asked, *Which Form of Data do you use the Most Often?* The answer choices were Student data other than test scores, Test scores, Teacher grades, Benchmark data, and Internally-generated student data from learning software. The results are shown in Table 4.20.

Table 4.20

Which Form of Data do You Use the Most Often?

	Response Percentage	Frequency*
Student data other than test scores	11.58	11
Test scores	42.11	40
Teacher Grades	9.47	9
Benchmark data	32.63	31
Internally generated data from software	4.21	4

*N = 95

Level of Data-Driven as Determined by Self-Reported Use of DDDM Behaviors

Survey question # 23 was designed by the researcher to determine the extent of the respondents' use of statistical behaviors (Appendix E). The question was *Which data*

tasks have you completed this year? Twelve DDDM behaviors were included in the answer choices. Some of the more common statistical behaviors utilized by school principals came from the first four of the twelve DDDM behaviors. Those choices were *reviewed test scores, made graphs of test scores, sent test score information to teachers,* and *presented test score information to teachers*. On the other end of the spectrum were four statistical behaviors which require more of a statistical background: *isolated variables to determine cause and effect, made predictions based upon new data*, *created linear regressions with data*, and *checked reliability and validity of data*. The responses from this survey question were used by the researcher to determine the data-driven level of the respondents to answer Research Question 3. The researcher determined that a respondent was a level 1 if they marked between 0 and four behaviors, a level 2 if they marked between 5 to 8 behaviors, and a data-driven level of 3 if they marked more than 8 DDDM behaviors. Figure 4.9 indicates how the 95 principals who answered this question were assigned a data-driven level. Only 5 respondents were rated as a data-driven level 1. Sixty of the respondents were determined to be a level 2 data-driven principal, and 30 were determined to be a level 3 data-driven principal.

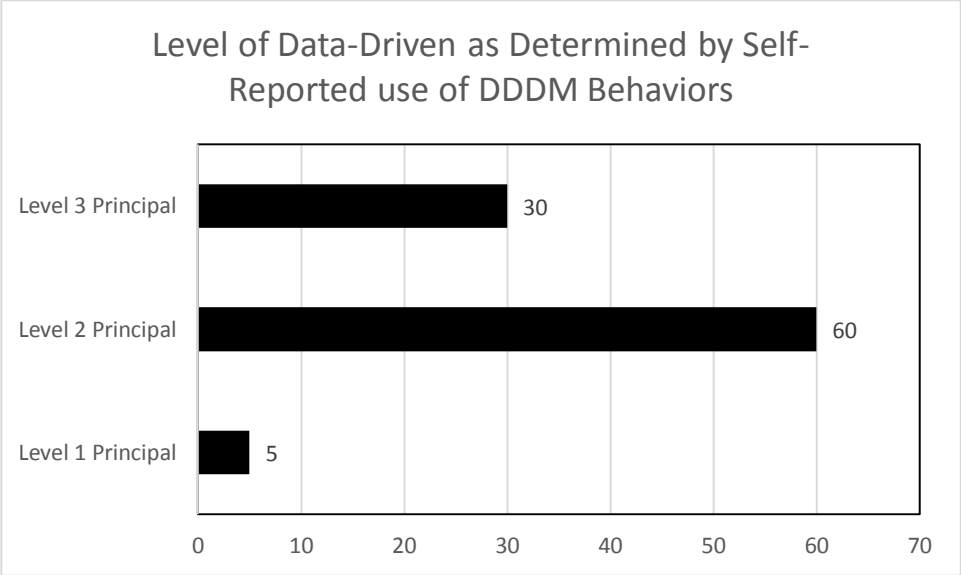

Figure 4.9 Level of Data-Driven as Determined by Self-Reported Use of DDDM Behaviors

Data-Driven Level and Student Achievement

Research question # 3 was:

To what extent is there a relationship between the data-driven level of the principals and:

a. Percent of students who pass their End of Course (EOC) test(s) in Grades 8-12

b. Percent of students in Math and English/Language Arts scoring Met and Exemplary on the Palmetto Assessment of State Standards (PASS) in Grades 6-8

c. Percent of students who score Proficient and Advanced on the High School Assessment Program (HSAP) Assessment in Grade 10

The first analysis of data-driven level and student achievement was to examine whether there was a relationship between the principals' data-driven level and their students' performance on their respective EOC Assessments. The level 1 principals had a mean of 97.9 % (SD=2.69) of their students pass their EOC Assessments. Level 2 principals had a mean passage rate of 88.79% (SD=14.38), and level 3 principals had a passage rate of 91.12% (SD=13.31). There were only two principals who had both a 1 rating and had EOC scores. This greatly reduced the validity and reliability of the reported data. When a Pearson Correlation was run between the degree of data-driven level and EOC scores, the results are shown in Table 4.21.

Table 4.21

Pearson Correlation Results of Degree of Data-Driven Level and EOC Scores

R value	-0.011
Fisher 95% CI	.0329 to 0.310
Hypothesized value	0
T approximation	-0.07
DF	36
p-value	0.9480
HO:	p=0

N=38

The r-value was -0.011, indicating there was no significant relationship between the data-driven level of the principals and their respective EOC scores.

The next analysis was to examine whether there was a relationship between the principals' degree of data-driven level and PASS results in English Language Arts and Math. The mean PASS passage rate for ELA for the level one principals was 68.25% (SD=13.22). The passage mean for level 2 principals was 79.69% (SD=10.44) and

78.23% (SD=13.98) for level 3 principals. The Pearson Correlation results for this analysis are shown in Table 4.22.

Table 4.22

Pearson Correlation Results of Degree of Data-Driven and PASS Results in English Language Arts

R value	0.007
Fisher 95% CI	-0.216 to 0.230
Hypothesized value	0
T approximation	0.06
DF	76
p-value	0.9491
HO:	p=0

N=78

The r-value was 0.007, indicating there was no significant relationship between the principals' data-driven level and their respective PASS ELA passage rates.

In the analysis of data-driven level and PASS Math, the results were: The level one principals had a PASS Math passage mean of 67.75% (SD=15.91), level 2 principals had a mean passage rate of 75.57% (SD=12.14), and level 3 principals had a PASS Math passage mean of 73.13% (SD=16.0). The Pearson Correlation results are shown in Table 4.23.

Table 4.23

Pearson Correlation Results of Degree of Data-Driven Level and PASS Math

R value	-0.043
Fisher 95% CI	-0.264 to 0.183
Hypothesized value	0
T approximation	-0.37
DF	75
p-value	0.7106
HO:	p=0

N=77

The r-value was -0.043, indicating there was no significant relationship between the principals data-driven level and their respective PASS Math passage rates.

The final relationship investigated by the researcher was between the principals' data-driven level and their respective HSAP passage rates. The level 1 principals had a mean passage rate of 100% for both math and ELA. There was only one level 1 principal with HSAP scores, and it was an academic magnet school where 100% of the students passed their HSAP Assessments. The passage rate for the level 2 principals was 64.53% (SD=16.0) for ELA and 55.59% (SD=20.0) for Math. The mean passage rates for level 3 principals were 57.9% (SD=7.64) for ELA and 48.6% (SD=7.95) for Math. The Pearson Correlations for Data-driven level and HSAP ELA passage rates are shown in Table 4.24.

Table 4.24

Pearson Correlation Results of Degree of Data-Driven Level and HSAP ELA

R value	-0.043
Fisher 95% CI	-0.784 to 0.077
Hypothesized value	0
T approximation	-1.83
DF	13
p-value	0.0897
HO:	p=0

N=15

The Pearson Correlation results for data-driven level and HSAP Math passage rates are shown in Table 4.25.

Table 4.25

Pearson Correlation Results of Degree of Data-Driven Level and HSAP Math

R value	-0.452
Fisher 95% CI	-0.783 to 0.078
Hypothesized value	0
T approximation	-1.83
DF	13
p-value	0.0904
HO:	p=0

N=15

Again, the r-value was -0.043 for Data-driven level and HSAP ELA and -0.452 for Data-driven level and HSAP Math passage rate. Both of these r-values show the lack of a relationship between the principals' data-driven level and the students' HSAP passage rates.

The last two survey questions were added to gain an insight as to how the principals felt about DDDM with respect to their need for additional DDDM skills and how they felt about the need for DDDM skills in the principalship in the future. Question twenty-six (Appendix E) asked if the respondents would like to learn additional skills to become more data-driven. Seventy-seven or 81.05% of the respondents indicated that they would like to learn additional skills to become more data-driven. This was in spite of the fact that 63% of the respondents self-rated themselves an 8, 9, or 10 on a 1(lowest) to 10 (highest) Likert scale. The last question was *In the future, do you believe being data-driven will become more or less necessary as an instructional leader?* Ninety-three or 97.89% of the respondents indicated that DDDM skills will be more important in the future.

Summary

This chapter presented the findings of this research study. The reported quantitative findings are based on the voluntary responses of 96 principals in the Charleston, South Carolina area who responded to an on-line survey. Additional information was obtained from district and school web-sites as well as the respondents' respective South Carolina School Report Cards.

As stated in prior chapters, the purpose of this study was to: add clarity to the concept of DDDM, define the behaviors which would identify a principal as being a data-driven principal, and explore any relationships with the use of DDDM behaviors and student achievement variables from the respective state report card values. A discussion of these findings follows in Chapter Five.

CHAPTER 5

STUDY SUMMARY

Chapter 5 starts with a brief summary of the study. The summary includes a discussion of the purpose of the research and a review of the methodology for the research. The chapter continues with a discussion of the findings as they relate to the literature. The chapter concludes with the implications of the research and recommendations for further study.

Summary of the Study

> DDDM is a popular concept in education reform that can mean many things, but there is little rigorous research to test its efficacy for improving student achievement. Most of the research on DDDM in schools consists of case studies about small numbers of schools or districts or surveys that include larger numbers of participants but that provide only suggestive evidence about how DDDM affects student achievement. (Schwartz & Hamilton, 2013, p. 1)

The purpose of this study was to attempt to address this gap of efficacy within the academic research and sought to examine whether a data-driven principal can positively affect student achievement. Additionally, the research attempted to add clarity to the

knowledge and skills associated with DDDM and assist current principals to assess their own levels and understanding of their DDDM behaviors. The questions which guided this research study were:

1. To what degree do current school principals in select districts from the Charleston area of South Carolina see themselves as data-driven leaders?

2. To what extent are the 12 specific behaviors that define a data driven principal, as self-reported, present in these principals?

3. To what extent is there a relationship between the data-driven level of the principals and:

a. Percent of students who pass their End of Course (EOC) test(s) in Grades 8-12

b. Percent of students in Math and English/Language Arts scoring Met and Exemplary on the Palmetto Assessment of State Standards (PASS) in Grades 6-8

c. Percent of students who score Proficient and Advanced on the High School Assessment Program (HSAP) Assessment in Grade 10

To conduct this research, a quantitative research methodology was utilized. A 27 question on-line survey was sent to 169 principals from 5 local school districts. Ninety-six principals responded and completed the on-line survey. Descriptive statistics were used to analyze the data from the surveys in three major areas: demographics, principal DDDM behaviors, and the relationship between principals' use of DDDM behaviors and student achievement.

There were two important findings in the area of demographics. The first was the ages of the respondent and also the principals' years of experience. Eighty-two percent of the respondents were under the age of 56, and only18% of the respondents were over the age of 56. The National Center for Education Statistics reports that the average age for a public school principal in the United States is 49.3, and for South Carolina the average age is 49.0. This lack of older principals in the study group seems to have depressed the values of principals' years of experience. In this study group, 49.5% of the respondents had less than 4 years of experience as a principal, and only 31.6% of the respondents had over 8 years of experience as a principal. Clark, Martorell, and Rockoff (2009) studied the New York City School system, the largest school system in the country with over 1,000 principals, and concluded that there is a direct relationship between the principals' years of experience and school and student achievement.

In the area of the description of the respondent principals as related to DDDM, there were two important findings. The first finding was in the educational level of the respondents. Only 37.2% of the principals had a degree of Ed.S. or higher, and 62.8% of the principals had a Master's Degree. In addition to the degree the respondents held, the number of statistics classes taken was also examined; 36.2% of the respondents had taken 1 or no statistic classes. Only 28.7 of the principals had taken 3 or more statistic classes. According to Mandinach, et al., (2011) the understanding of statistics is vital to successful DDDM.

Research question 1 was answered by way of the respondents rating themselves as to their data-driven level on a 1 to 10 Likert scale with 1 being the lowest. The vast majority of the respondents, 62.8%, rated themselves as an 8, 9, or 10. This seems high

when you aggregate the earlier findings of low average age, low years of experience, few advanced degrees, and few statistic classes taken. It is certainly plausible to assert that this heightened self-assessed data-driven level is due in part to the halo-effect as the respondents own biases positively affected their self perceptions. Additionally, since the phrase "data-driven" has become so prevalent in educational conversations, the respondents may have been influenced to heighten their own personal perceptions of their data-driven levels.

The important finding with regard to the survey questions from the *Principal Data-Driven Decision Making Index* (P3DMI) published by Childress and Luo in 2009, was that the principals utilized DDDM within the domain of *school instruction* more than the areas of *school vision*, *school organization*, and *collaborative partnerships*. This again may be a result of the general, limited experience of the population in the study. Data with respect to school instruction is abundant, even for the novice principal, but in the areas of vision, organization, and collaborative partnerships, the principals need to generate or find data in these areas.

Research question 2 was *To what extent are the 12 specific behaviors that define a data driven principal, as self-reported, present in these principals?* This question was answered by the respondents indicating the actual DDDM behaviors they had executed this year from a list provided in the survey. Twelve DDDM behaviors were listed as choices. The choices ranged from the more simple DDDM behaviors like reviewed test scores to the more sophisticated DDDM skills such as creating linear regressions. The researcher assigned the data-driven level as a 1, 2, or 3 based upon the number of behaviors the respondents reported. Reported behaviors of 0-4 resulted in a level of 1, 5-

8 behaviors resulted in a level 2, and 9-12 behaviors resulted in being labeled as a level 3 data-driven leader. Five or 5.3%, of the principals were labeled as a level 1. Sixty or 63.2% of the principals were a level 2, and 30 or 31.6% were identified by the researcher as a level 3. The level 3 percent of 31.6% of the respondents is low and contradicts how the respondents self-rated themselves earlier. When asked how data-driven they were, 62.8% of the respondents self-rated themselves as an 8, 9, or 10. In looking at all the aforementioned findings, the analysis of the respondents' reported use of DDDM skills may be a more accurate analysis than their own self-assessment of their ability to use DDDM.

Pearson correlations were utilized to examine the premise of research question 3 which was to examine if there were any relationships between the researcher-assigned data-driven level and student achievement. In all three of the correlations performed, there were no relationships found. The formula for student achievement certainly has many contributing variables. The difficulty with the search for a relationship in this study with the data-driven levels of the respondents and student achievement is that it was not possible to isolate the variable of principals' level of DDDM from all the other variables which effect student achievement.

Two other problems were revealed in this analysis. Only 5 of the principals were determined to be a level 1 data-driven leader. This resulted in executing correlations with too few subjects to produce a meaningful and accurate analysis for this group of principals. Additionally, there were both regular public schools and magnet schools in this correlation. The magnet schools, from a data perspective, were outliers and had an effect on the data analysis.

Findings Related to the Literature

In comparing the findings of this study with the literature in the area of DDDM, there seems to be agreement that there needs to be more research in examining the relationship of DDDM practices and student achievement. "First, more research is needed on the effects of DDDM on instruction, student achievement, and other outcomes. Research to date has examined effects on instruction to a limited extent and has yet to measure effects on outcomes" (Marsh et al., 2006 p. 11).

The findings of this study also agree with the literature and suggest that principals are entering the principalship without the necessary skills to successfully implement DDDM within their respective schools. Previously cited in the findings to this study were low years of experience, few statistic classes, low rate of advanced degrees, and the non-use of advanced DDDM behaviors. These factors all seem to have contributed to a system that produces few principals who utilize advanced statistical DDDM behaviors.

Implications

The implications of the research findings from this study are important for principals who would like to become stronger data-driven leaders. In this study, 81.1% of the respondents indicated that they would like to learn additional skills to become more data-driven. This, added to the fact that 97.9% of the respondents indicated that DDDM skills will be more important in the future, indicates that there is much work to be done in preparing our principals to be stronger, more confident data-driven school leaders.

In addition, the research findings from this study should be useful to principal preparation programs whether they are graduate school principal preparation programs or in school district professional development departments. The findings indicate that there must be improvements to these programs. The programs need to teach math, statistics, and technology while being cognizant that the content be relevant to the work of the principalship.

Recommendations for Further Research

This study examined the self perceptions of principals from five school districts near Charleston, South Carolina, with respect to their use of data-driven decision making. Additionally, the study examined the principals' use of DDDM behaviors and whether there existed any relationship between the use of DDDM behaviors and student achievement. The following are recommendations for future research:

1. Research the effects of DDDM and student achievement limited to traditional public schools.
2. Research DDDM behaviors which are used by effective data-driven leaders.
3. Additional research is needed on the attitudes and perceptions of principals for DDDM.
4. Additional research is needed on how years of experience affect the implementation and use of DDDM.
5. Examine the relationship between the principals' knowledge of technology and the use of DDDM.

6. Additional research is needed to determine if the principal preparation programs have kept pace with the skills required of present day administrators.

Conclusions

"In the current context of accountability and school reform, data-driven decision making is increasingly seen as an essential part of the educational leader's repertoire" (Knapp et al., 2006 p. 5). This study sought to shed light on the principals' self-assessed level of data-driven decision making and also on the utilization of DDDM skills in their leadership roles. Additionally, relationships between the level of data-driven behaviors and student achievement were examined. Although the researcher did not establish any relationships between the data-driven levels and student achievement, there were three important findings which add to the research in this area.

1. There was a contradiction between the participants' self-analysis of data-driven decision making level and their actual use of DDDM behaviors as determined by their survey responses. Sixty-three percent of the respondents rated their level of being data-driven as an 8, 9, or 10 on a scale of 1 to 10 with 1 being the lowest. However, only 30 or 31.6% of the participants were determined to be a level 3 data-driven level by the researcher based upon their reported use of DDDM behaviors.

2. When asked if the respondents would like to learn additional skills to become more data-driven, 77 or 81.05% of the respondents indicated that they would like to learn additional skills to become more data-driven.
3. When asked if you believe being data-driven will become more or less necessary as an instructional leader in the future, 93 or 97.89% of the respondents indicated that DDDM skills will be more important in the future.

The principals in this study seem to understand the increased need for data-driven decision making and would like to learn additional DDDM skills to meet the increased demands of the principalship.

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APPENDIX A- ORIGINAL E-MAIL TO INFORM

Dear South Carolina Colleague,

Later today you will receive an on-line survey via SurveyMonkey. Please, please complete the survey when it arrives. This survey will produce the last data I need to complete my dissertation in fulfillment of the requirements for the completion of my Ph.D. from The University of South Carolina. The survey will take less than fifteen minutes to complete. I thank you in advance for your help in completing this survey.

Jim Spencer

Principal: Marrington Middle School of the Arts

A National Blue Ribbon School

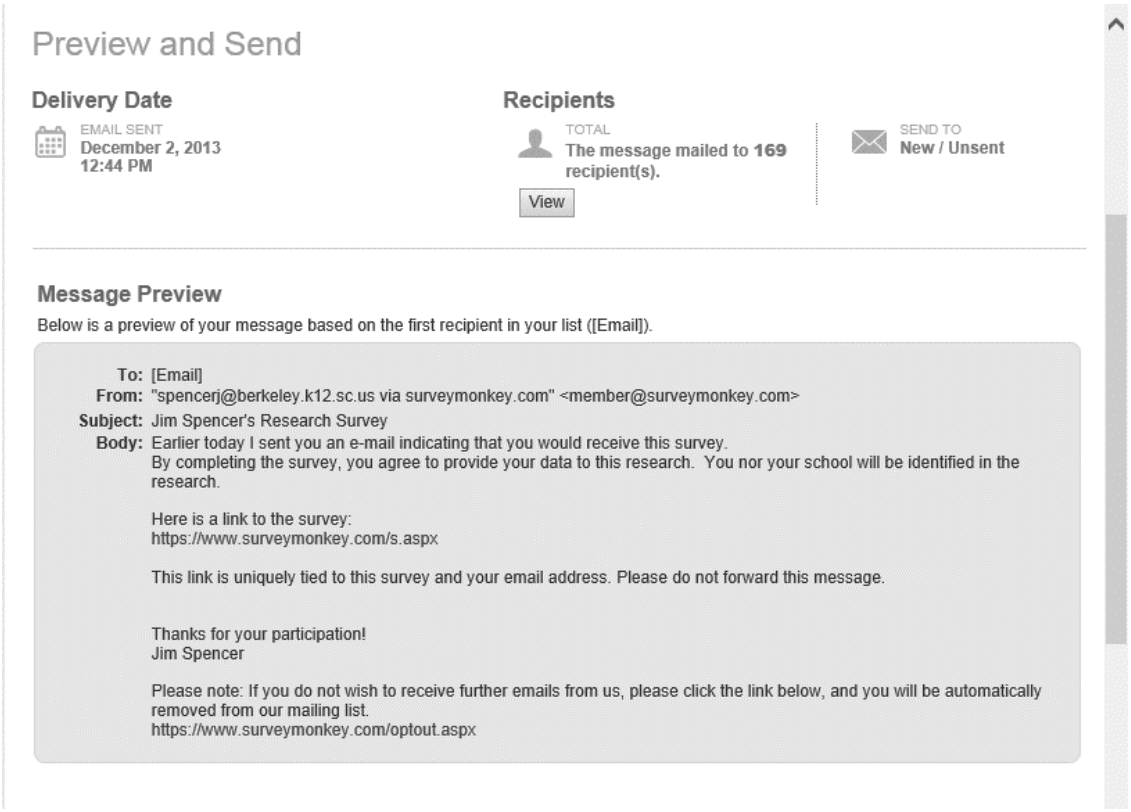
A Palmetto's Finest School

Phone 843-572-0313

Fax 843-820-4063

APPENDIX B- FIRST E-MAIL FOR PARTICIPATION

SurveyMonkey Invite: December 2, 2013 12:44 PM



Preview and Send

Delivery Date

EMAIL SENT
December 2, 2013
12:44 PM

Recipients

TOTAL
The message mailed to **169** recipient(s).

View

SEND TO
New / Unsent

Message Preview

Below is a preview of your message based on the first recipient in your list ([Email]).

To: [Email]
From: "spencerj@berkeley.k12.sc.us via surveymonkey.com" <member@surveymonkey.com>
Subject: Jim Spencer's Research Survey
Body: Earlier today I sent you an e-mail indicating that you would receive this survey.
By completing the survey, you agree to provide your data to this research. You nor your school will be identified in the research.

Here is a link to the survey:
https://www.surveymonkey.com/s.aspx

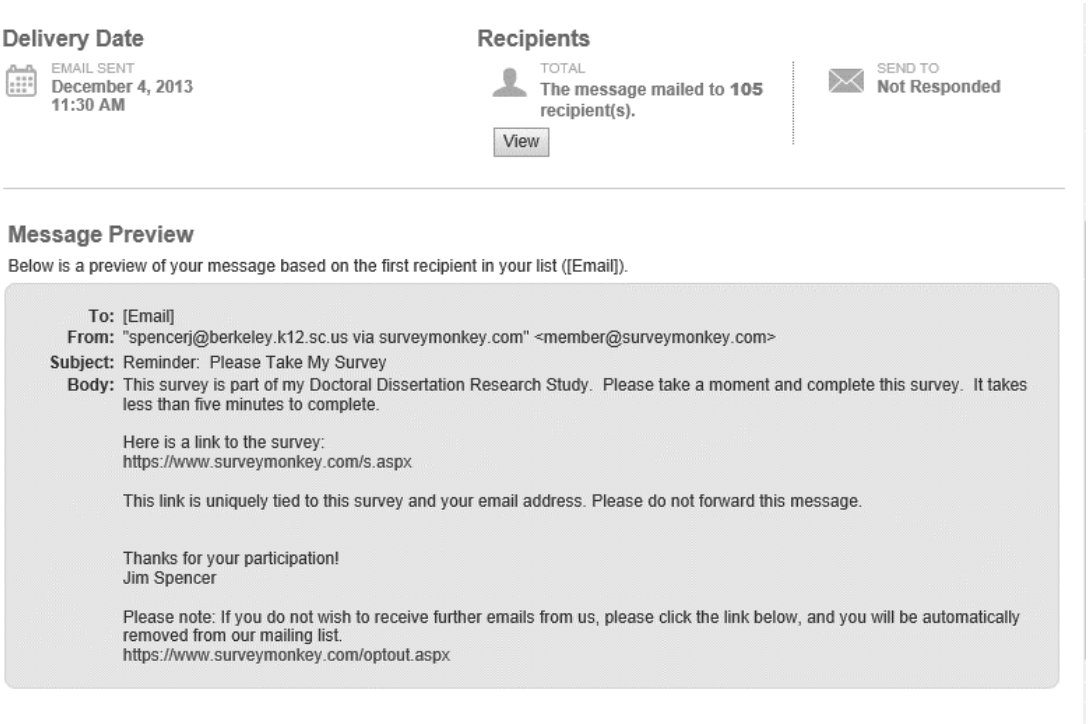
This link is uniquely tied to this survey and your email address. Please do not forward this message.

Thanks for your participation!
Jim Spencer

Please note: If you do not wish to receive further emails from us, please click the link below, and you will be automatically removed from our mailing list.
https://www.surveymonkey.com/optout.aspx

APPENDIX C- SECOND E-MAIL FOR PARTICIPATION

SurveyMonkey Invite: December 4, 2013 11:30 AM (Reminder)



Delivery Date

EMAIL SENT
December 4, 2013 11:30 AM

Recipients

TOTAL
The message mailed to 105 recipient(s).

View

SEND TO
Not Responded

Message Preview

Below is a preview of your message based on the first recipient in your list ([Email]).

To: [Email]
From: "spencerj@berkeley.k12.sc.us via surveymonkey.com" <member@surveymonkey.com>
Subject: Reminder: Please Take My Survey
Body: This survey is part of my Doctoral Dissertation Research Study. Please take a moment and complete this survey. It takes less than five minutes to complete.

Here is a link to the survey:
https://www.surveymonkey.com/s.aspx

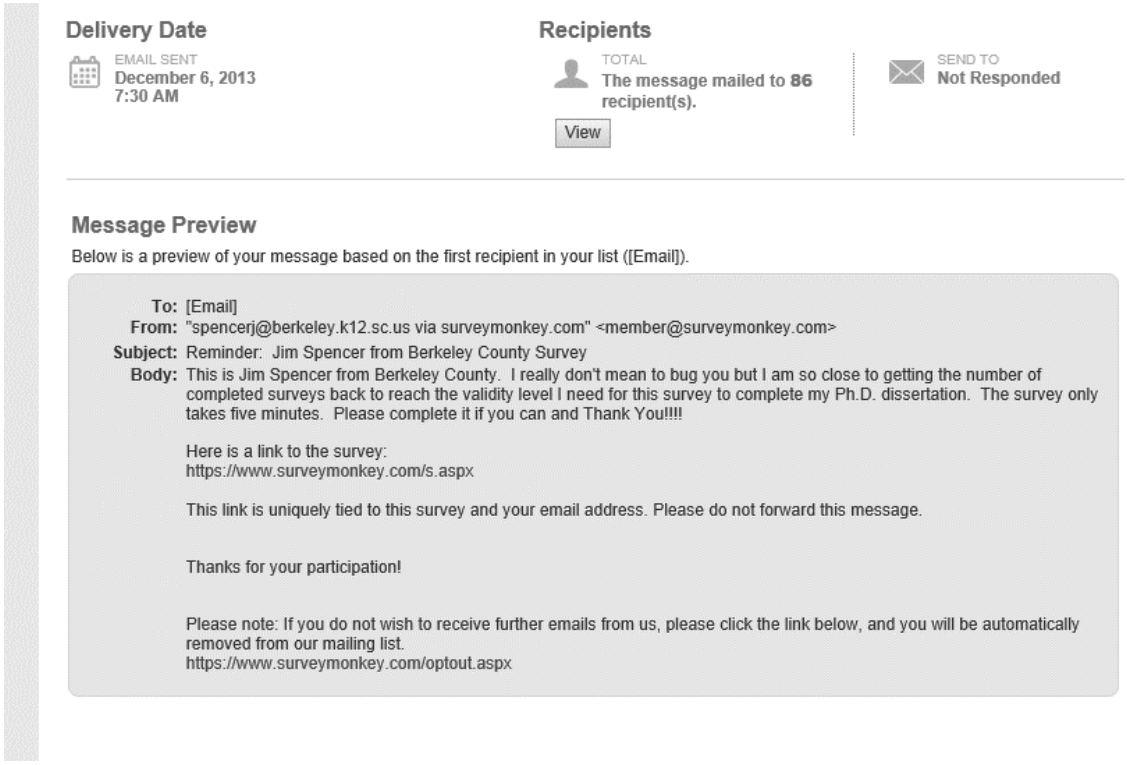
This link is uniquely tied to this survey and your email address. Please do not forward this message.

Thanks for your participation!
Jim Spencer

Please note: If you do not wish to receive further emails from us, please click the link below, and you will be automatically removed from our mailing list.
https://www.surveymonkey.com/optout.aspx

APPENDIX D- FINAL LETTER OF PARTICIPATION

SurveyMonkey Invite: December 6, 2013 7:30 AM (Reminder)



Delivery Date

EMAIL SENT
December 6, 2013
7:30 AM

Recipients

TOTAL
The message mailed to **86** recipient(s).

View

SEND TO
Not Responded

Message Preview

Below is a preview of your message based on the first recipient in your list ([Email]).

To: [Email]
From: "spencerj@berkeley.k12.sc.us via surveymonkey.com" <member@surveymonkey.com>
Subject: Reminder: Jim Spencer from Berkeley County Survey
Body: This is Jim Spencer from Berkeley County. I really don't mean to bug you but I am so close to getting the number of completed surveys back to reach the validity level I need for this survey to complete my Ph.D. dissertation. The survey only takes five minutes. Please complete it if you can and Thank You!!!!

Here is a link to the survey:
https://www.surveymonkey.com/s.aspx

This link is uniquely tied to this survey and your email address. Please do not forward this message.

Thanks for your participation!

Please note: If you do not wish to receive further emails from us, please click the link below, and you will be automatically removed from our mailing list.
https://www.surveymonkey.com/optout.aspx

APPENDIX E- ON-LINE SURVEY

Page 1

1. In which district is your school located?

2. What is the name of your school?

3. What level is your school?

4. How many students attend your school?

5. What is the free and reduced lunch percentage (added together) in your school?

Page 2

6. What is your age bracket?

7. What is your Gender?

8. How many years have you served as a school principal?

Page 3

9. How many years have you served as the principal at your current school?

10. What is the highest degree you have earned?

11. How many statistics classes have you taken?

12. Who completes the majority of statistical work in your school?

Page 4

13. How often do you do statistical work related to student data?

14. I use data to make decisions in aligning resources with the school vision.

15. I use data to define possible problems in vision implementation.

16. I use data to identify problems in student learning.

Page 5

17. I use data to make recommendations regarding student learning.

18. I use data to promote an environment for improved student achievement.

19. I use data to judge my performance in effective management.

20. I use data to develop effective communications plans.

21. I use data to develop effective approaches for school-family partnership.

Page 6

22. Which form of data do you use the most often?

23. Which data tasks have you completed this year?

24. I have reviewed the following test data this year other than test scores and achievement

25. How data-driven do you consider yourself? 1 being the lowest and 10 being the Highest?

26. Would you like to learn additional skills to become more data-driven?

27. In the future, do you believe being data-driven will become more or less necessary as an instructional leader?

APPENDIX F- EIRB USC APPROVAL LETTER

OFFICE OF RESEARCH COMPLIANCE

March 5, 2014

James Spencer

College of Education

Education Leadership & Policies

Wardlaw College

Columbia, SC 29208

Re: **Pro00015915**

Study Title: *Data-Driven School Administrator Behaviors and State Report Card Results*

Dear Mr. James Spencer:

The Office of Research Compliance, an administrative office that supports the University of South Carolina Institutional Review Board (USC IRB), reviewed the referenced study on behalf of the USC IRB, and determined that the proposed activity is exempt from the Protection of Human Subjects Regulations (45 CFR 46.102). No further oversight by the IRB is required; however, the investigator should inform this office prior to making any substantive changes to the study, as this may alter the exempt status of the study.

If you have questions, please contact Arlene McWhorter at arlenem@sc.edu or (803) 777-7095.

Sincerely,

Lisa M. Johnson

IRB Manager