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Pepperdine University

Graduate School of Education and Psychology

THE EXTENT OF THE USE OF DATA-DRIVEN INSTRUCTION TECHNIQUES IN MIDDLE SCHOOL INSTRUCTION

A dissertation submitted in partial satisfaction

of the requirements for the degree of

Doctor of Education in Educational Leadership, Administration, and Policy

by

Scheherazade Dedman

November, 2014

Robert Barner, Ph.D. – Dissertation Chairperson

This dissertation, written by

Scheherazade Dedman

under the guidance of a Faculty Committee and approved by its members, has been submitted to and accepted by the Graduate Faculty in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

Doctoral Committee:

Robert Barner, Ph.D. – Chairperson

John White, Ed.D.

Jay Jackson, Ed.D.

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DEDICATION

This dissertation is dedicated to my loving daughter Niyah De La Luz. The love and support she showed me through this process helped me to finish. Thank you! Mommy loves you with all her heart.

ACKNOWLEDGEMENTS

Many people have made this dissertation possible. I would like to acknowledge their contributions and express my gratitude.

I would first like to thank Jesus for giving me the faith and strength to work on my dissertation.

In addition, I would like to thank my daughter and family who have always loved and supported me unconditionally; without their love and support, I would not have been able to complete this dissertation.

I would also like to thank my committee chair, Dr. Robert Barner, for his patience, encouragement, and support throughout this whole process, the late Dr. John Fitzpatrick, who made learning fun at Pepperdine, and Dr. Granoff for all his guidance.

I thank the rest of my committee members, Dr. John White, who was also my principal at Mulholland, and Dr. Jay Jackson. I also thank my editor Rebekka Helford because I could not have completed this dissertation without her. Finally, I wish to express appreciation for all the teachers who participated in my survey.

VITA

EDUCATION

Pepperdine University - Graduate School of Education and Psychology
Ed.D. Administration in progress

Pepperdine University - Graduate School of Education and Psychology
M.S. Administration with Tier I credential 2005

California State University, Northridge
Professional Credential May 2001

Pepperdine University - Seaver College
B.A. Liberal Arts, concentration in History
Activities: PepReach mentor
Amnesty International member, V.P. of Optimist International
New Student Orientation Counselor.

EXPERIENCE

Vena Gifted/High Ability Magnet, Arleta, CA 2011-present
Teacher
Fifth grade

Mulholland Middle School, Lake Balboa, CA 2005-2011
Teacher
Sixth grade: math, science, and English
Seventh/eighth grade: math intervention

VAUGHN LEARNING CENTER, San Fernando, CA 1999-2005
Teacher
Fifth grade, Fourth grade, Third grade

ACTIVITIES I serve as **Grade Level Chair** to organize meetings, create agendas, and communicate between grade levels and faculty. I served on the **School Site Council Committee** Mulholland Middle School. I have taught and am recently teaching Gifted/Talented students. I am adept at using Mydata in order to guide my instruction and plan for intervention. I served as **Science Cadre** to demonstrate science lessons, answer inquiries and bridge communication between the district and Mulholland Middle School. I served as the **Chair of the Bureau of Student Affairs Committee** to organize monthly student activities, budgeting, and supervising teachers in completion of projects. I created and organized the **Coordinated School Health Program Committee**, which monitored school health and nutrition, created and implemented professional developments, and implemented school activities and clubs based on school health and nutrition. I have also served numerous times as a **Demonstration Teacher**, modeling lessons, classroom management and discussing areas of improvement and strengths. At Vaughn, I served as **Fifth Grade Clan Leader** to

organize meetings and bridge communication between clans. I also served on the **Business Committee** and the **Budget Sub-committee** as Co-Chair to organize Vaughn's pecuniary matters. Furthermore, I served on the **Spelling Committee** that organized the spelling bee.

LANGUAGE Basic knowledge of Spanish and active in further development of this skill.

COMPUTER PC and Macintosh proficient. Thorough knowledge of Microsoft applications such as Power Point, Word, and Excel. Adept in use of Internet.

Professional Development

Common Core - LAUSD
Thinking Maps – LAUSD
LAVA Training - LAUSD
ACSA Conference – Santa Clara
CLMS Conference – San Diego
AASA Conference – New Orleans
Worksheets Don't Grow Dendrites
Hands-on-Equation Training
Diversity/Tolerance Training – Museum of Tolerance
LACOE Math Training
Foss Science Training
BTSA Workshops
Time Management Training – Scott Purdy
SDAIE Training

ABSTRACT

This study investigated whether data-driven instruction affects or informs strategies that middle school teachers use in their planning, teaching strategies, and assessments, and explored whether teachers use these data in order to make changes in their classroom and instruction. In addition, this study examined the types of data middle school teachers use in order to inform their instruction, whether the number of years taught had an effect on how they used data-driven instruction, and whether they found it effective. To this effect, teachers at a middle school in Southern California were asked to complete an online survey.

This study provided understanding into teachers' opinions of data-driven instruction. This study was conducted with teachers at a Southern California Middle School; out of the 51 teachers, only 30 responded to the survey, comprising 62% of the teachers. Therefore, the results may not be representative of all middle school teachers.

The majority of the teachers felt that data-driven instruction was important, but not necessarily effective. However, most of the teachers used various data in order to modify their instruction to meet students' needs. Also, years

taught and subject taught affected what type of data teachers used and how they used the data to drive their instruction.

Future research should be conducted at multiple school sites at the middle school level and should include more participants. Future research should also explore the effectiveness of technology when analyzing data and include questions that include non-core academic subjects.

Based on the findings of this study, it is possible that data-driven instruction can be an integral part of creating success at the middle school level and closing the achievement gap.

Chapter One: Introduction

Background of the Problem

Many educators and administrators across the U.S. have begun to focus on the success of middle school students. According to the Edna McConnell Clark Foundation (2000), only a small number of middle schools in America provide a challenging academic atmosphere for their students, whether they are populated with middle class Caucasian students or high poverty students. Even though the scores are higher at majority Caucasian schools, it seems clear that most middle schools are not maximizing students' capabilities.

Students who are unsuccessful in multiple subjects in middle school tend to perform poorly in high school, are more likely to drop out before their senior year, and are less likely to go to college (National Middle School Association [NMSA], 2003). According to the National Assessment of Educational Progress (NAEP), in 2009 and 2011, less than one-third of eighth grade students scored proficient in science, and only 36% scored proficient or advanced in reading and math (Hawaii 24/7, 2011).

As shown in Figures 1, 2 and 3, less than 30% of U.S. eighth grade students scored proficient in science and only 36% scored proficient in math and reading.

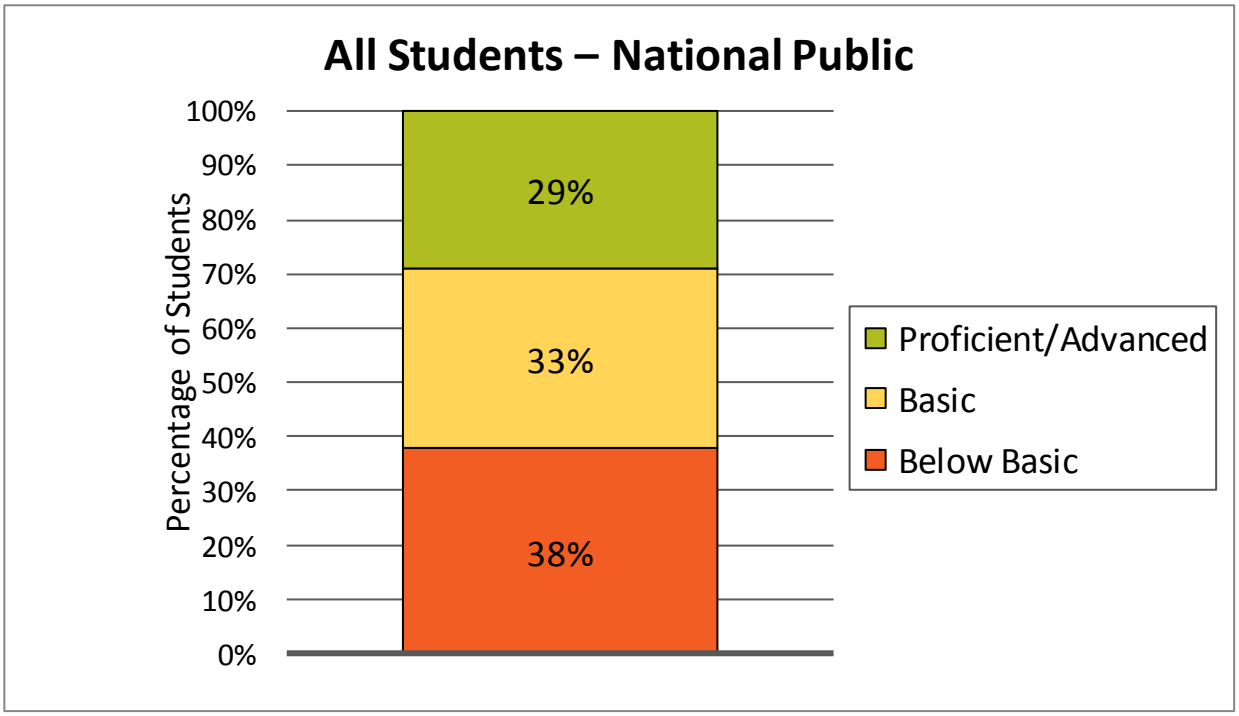

Figure 1. Achievement-level results in eighth-grade NAEP science: 2009. From *The Nation's Report Card: Science 2011: National Assessment of Educational Progress at Grade 8*, by National Center for Education Statistics. Retrieved from http://nces.ed.gov/nationsreportcard/pdf/main2011/2012465.pdf. Copyright 2012 by National Center for Education Statistics. Adapted with permission.

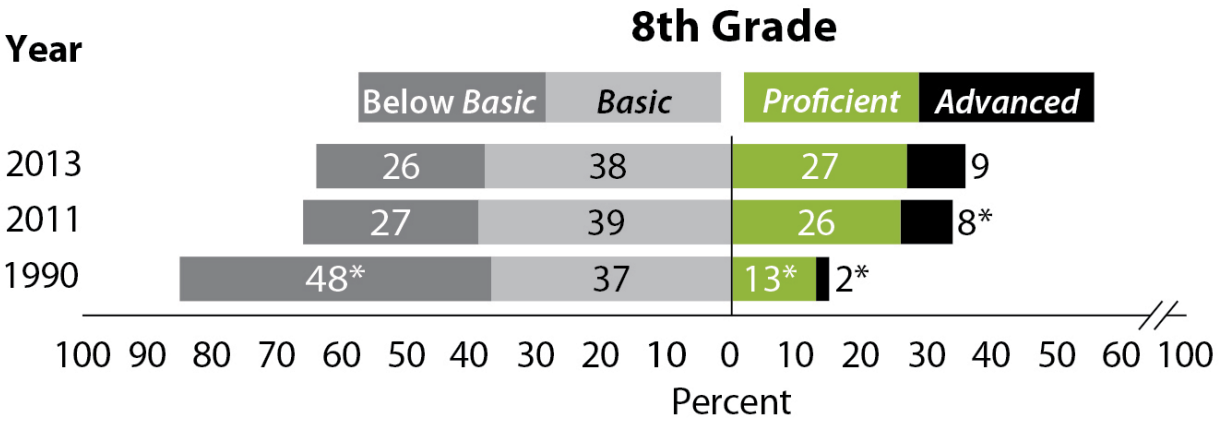

Figure 2. Achievement-level results in eighth-grade NAEP mathematics: 1990, 2011, and 2013. From *The Nation's Report Card: A First Look: 2013 Mathematics and Reading*, p. 7, by National Center for Education Statistics. Retrieved from http://nces.ed.gov/nationsreportcard/subject/publications/main20

13/pdf/2014451.pdf. Copyright 2013 by National Center for Education Statistics. Reprinted with permission.

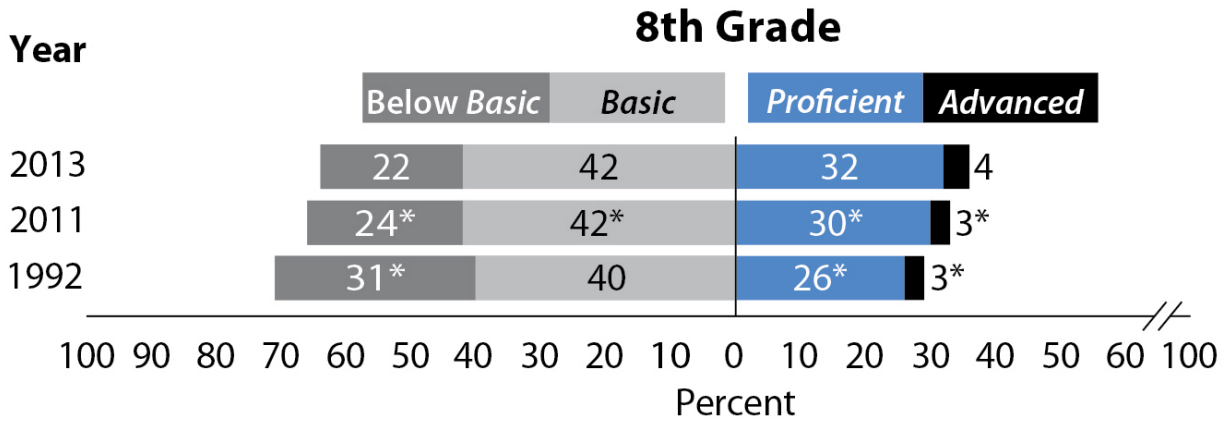

Figure 3. Achievement-level results in eighth-grade NAEP reading: 1990, 2011, and 2013. From *The Nation's Report Card: A First Look: 2013 Mathematics and Reading*, p. 7, by National Center for Education Statistics. Retrieved from http://nces.ed.gov/nationsreportcard/subject/publications/main2013/pdf/2014451.pdf. Copyright 2013 by National Center for Education Statistics. Reprinted with permission.

Students at the middle school level are having difficulty earning high grades and performing well on state tests. From the time the students culminate from elementary school until they enter middle school, there appears to be a disparity in achievement level, especially for Hispanics, African-Americans, and high-poverty students. According to Balfanz, McPartland, and Shaw (2002), "Nearly all high-poverty students enter kindergarten with the most basic knowledge at hand; however, many students end middle school ill prepared to succeed in a rigorous sequence of college-preparatory courses in high school" (p. 144).

According to Balfanz et al. (2002), academic achievement levels of U.S. students fall far behind those of other developed nations. It is especially disheartening to see the achievement gap between high-poverty students, Hispanics, and African-Americans and their Caucasian and Asian American counterparts in academic achievement at the middle school level. "For many high-poverty students, the middle grades are a period in which achievement gaps in mathematics become achievement chasms" (p. 144). Closing the achievement gap is important in order for all students to be successful in middle school.

> Middle school student success is so important that new legislation was introduced in 2009 hoping to provide billions of dollars just for the middle grades. The Success in the Middle Act was first introduced in 2007, by then-Senator Obama, and again in 2009 by Senator Reed. The Success in the Middle Act is designed to help middle schools across the nation, specifically high poverty middle schools, provide a high-quality education for all students. However, the Success in the Middle Act was never enacted and was re-introduced in 2013 by Rep. Raúl Grijalva (D-AZ) and Sen. Sheldon Whitehouse. (D-RI; Hawaii 24/7, 2011)

If the Success in the Middle Act is passed, school districts, administrators, and teachers are hoping to increase student achievement at the middle school level. They are also

hoping to close the achievement gap that exists in middle school subjects such as mathematics and science between Hispanic and African-American students and their White and Asian American counterparts. Closing the achievement gap in middle school will help African-American and Hispanics to be academically successful in high school and college.

In an effort to close the achievement gap for African-American and Hispanic students, administrators and teachers have begun to analyze student performance data. Using data as a tool has the potential to provide educators with the opportunity for meaningful collaboration and the ability to reflect on successful teaching and learning environments for all students (Courneene, 2008).

According to the National Middle School Association (NMSA, 2003), in order to promote quality education among adolescents, it is imperative for students to be introduced to data as a guide for academic achievement. Students can be introduced to data by having them look at their state test scores, review their classroom assessments, and or create portfolios of their work by subject area. By introducing data to students, they will have a better understanding of their strengths and weaknesses that will, in turn, help them to be successful academically. Indeed, states, school districts, and schools are beginning to implement data-driven instruction as a process for increasing

student achievement and closing the achievement gap for Hispanic and African-American students (Johnson, 2002).

A report from the National Commission on Teaching and America's Future (NCTAF, 2007) stated that in order for students to be successful in school, educators must be willing to leave behind their old ways of teaching and embrace the changes that are occurring both demographically and technologically. "Students do not have the ability to achieve higher standards of learning unless teachers are prepared to teach in new ways and schools are prepared to support high-quality teaching" (NCTAF, 1996, p. 68). Students need teachers who understand how to design a lesson that promotes student achievement based on data analysis. Teachers must be willing to modify their instruction when analyzing data for students' strengths and weaknesses. According to Darling-Hammond (1998),

> Teachers need to be able to analyze and reflect on their practices, to assess the effects of their teaching, and to refine and improve their instruction. They must continuously evaluate what students are thinking and understanding and reshape their plans to take account of what they've discovered. (p. 2)

Educators have given ample consideration to integrating standards into curriculum frameworks and assessments that offer information about student performance, allowing teachers to

understand what students can do and how to support their ongoing learning (NCTAF, 2007). With assessments that measure students' strengths and weaknesses, teachers can teach more purposefully and guide their instruction continually so students can better understand and demonstrate what they have learned.

The NCTAF (1996) describes assessing how students are learning, evaluating students' academic performance levels, and making modifications in what students are expected to learn as key practices that "connect standards to learning to the building of shared standards for teaching" (p. 66). In their 1996 report, the NCTAF stated that the use of data already existed in environments where school faculty were working together to: implement standards into guided lessons for students, implement standards into learning tasks, and ensure assessments were standards-based. When faculty members were working to become experts and collaborating in their practices, these norms would result in higher student achievement.

However, many schools and districts believe that data from state assessments are neither sufficient nor timely enough to allow them to make informed school decisions and guide instruction (Bernhardt, 2004). Several schools and districts have learned to use data successfully by analyzing not only state level assessments, but also school level data, such as periodic assessments, and classroom level data, such as

homework, tests, and quizzes. In fact, many of the schools and districts that have reportedly been making strides in their efforts to increase student achievement have been engaging in data-driven decision-making (Education Commission of the States, n.d.).

Northwest Middle School in Salt Lake City, Utah is an example of a middle school that has implemented data-driven instruction successfully and is also seeing results. The school's population includes 87% minority students and 90% of their student body qualifies for free and reduced lunch.

> The school has made an effort to inform parents about the student achievement data available to them. That data sharing extends to students as well, with a push for teachers to track the progress of each student and regularly communicate what can and needs to be done to improve. (Wood, 2013, p. 6)

Seventy-nine percent of their students scored proficient in math in 2013, up from 37% in 2010, 58% of their students scored proficient in science, up from 38% in 2010, and their reading levels have improved from fourth grade to seventh grade (Wood, 2013).

Lashway (2002) described data-driven instruction as the consistent use of objective information (i.e., data) to enhance human judgment. This process involves collecting, analyzing,

reporting, communicating, and using data from a variety of sources for school improvement purposes (American Association of School Administrators [AASA], n.d.). Some schools are using student performance and other assessment data to: identify achievement gaps, specific students for remediation/intervention, or students for gifted and talented programs; align curriculum and instruction; and plan professional development activities. In order for data to be useful in school-level reform, it is critical that assessment data are used to provide guidance, informing educators that they are moving in the correct direction (Supovitz & Klein, 2003).

In order for schools to have access to student data, the No Child Left Behind Act (NCLB) has required that technology be implemented in schools. Today, nearly every public school has access to the Internet (U.S Department of Education, Office of Educational Technology, 2004). Schools and districts have been given the ability to become more advanced technologically, and have become progressively more enhanced in their ability to compile, store, and study data. Bernhardt (2004) stated that a school's success depends on the degree to which principals make or lead decisions based on pertinent data. With technology and data-driven instruction, teachers and administrators have the ability to analyze student assessments at a faster pace in order to guide instruction (Streifer, 2002).

Teachers use many forms of assessments that fall under the category of either formative or summative assessment. Formative assessments are continuous assessments, observations, and evaluations that classroom teachers complete in order to improve and differentiate their instruction. Similarly, students can also keep track of their progress on formative assessments, which in turns empowers them to work harder (Johnson, 2002). Teachers tend to use formative assessments more regularly than summative assessments. Teachers commonly use formative assessments because they find formative assessments easier to analyze when using data-driven instruction to improve student achievement. Examples of formative assessments include quizzes, tests, essays, and student portfolios (Garrison & Ehringhaus, 2007).

In contrast, teachers generally use summative assessments as placement guides in order to place students in particular programs such as intervention or gifted/talented programs. Summative assessments can also be used as tools to help evaluate the usefulness of particular instructional programs and services in order to increase student achievement at any point during the school year. The main goal of summative assessments, however, is to evaluate student success when the academic school year is complete. Summative assessments measure success based on standards and identify students' strengths and weaknesses.

Examples of summative assessments include the California Standards Test (CST), final exams, and periodic assessments (Garrison & Ehringhaus, 2007).

According to Henke (2004), "As school district officials invest in systems to do the necessary data collection and reporting to state agencies, they are also discovering that the information they gather, test scores, attendance, and demographics can become assets in surprising ways" (para. 1). Schools use data not only for instructional purposes, but also to keep administrators and teachers informed about student attendance, which in turn helps them understand why some students are having difficulty in school. Data can also be used to help teachers improve their teaching skills; knowing one's weaknesses can help improve and guide a teacher's instruction (Datnow, Park, & Wohlsletter, 2007). By using data, administrators can decide on the most effective professional development to implement at their school site: professional development that would benefit their staff, instead of activities that leave staff members feeling that their time has been wasted. The use of data can also help a school to disaggregate information based on demographics (Henke, 2004). As mentioned previously, schools that have a high population of African-American and Hispanic students tend to have low student achievement compared to suburban schools with a large Caucasian

student population. By disaggregating data by demographics, schools can detect students' weaknesses and strengths and plan accordingly (Johnson, 2002).

Therefore, the goal of this descriptive study was to add to the body of research that documents teachers' use of data at the school level, looking specifically at the practices of middle school level teachers. According to Stanley and Tubbs (2007), "Data has become the foundation of the contemporary design of accountability, and this reliance on data will continue in public education for the likely future" (p. 2).

Problem Statement

Many middle school students are struggling to be successful academically. As mentioned previously, according to Balfanz et al. (2002), academic achievement levels of U.S. students fall far behind those of other developed nations. It is especially disheartening to see the achievement gap between high-poverty students, Hispanics, and African-Americans and their Caucasian and Asian American counterparts in academic achievement at the middle school level. "For many high-poverty students, the middle grades are a period in which achievement gaps in mathematics become achievement chasms" (p. 144). Implementing data-driven instruction in the classrooms and closing the achievement gap is important in order for all students to be successful in middle school.

However, perceptions of middle school teachers and their instructional practices, as related to data-driven instruction, had not been studied fully. The opportunity existed to investigate the perceptions of middle school teachers' use of data-driven instruction to learn more about how they use data to inform instructional practices, how often they modify their instruction, and what strategies they implement to improve academic success.

A middle school in Southern California that was recommended by a university professor who was familiar with this school has been utilizing data-driven instruction to improve student academic achievement. For this reason, the middle school was selected for this study to learn more about middle school teachers' data-driven instruction.

Purpose of the Study

The purpose of this quantitative survey study was to investigate middle school teachers' perceptions regarding: (a)the value of using data-driven instruction to improve student performance, (b)the frequency with which teachers used various types of data when using data-driven instruction, and (c) what methods teachers used to modify instruction based on student data. A second purpose of the study was to explore how, if at all, teachers' instructional practices were related to teacher

years of experience, number of students taught each week, and teachers' primary subject areas.

Research Questions

In order to develop a better understanding of middle school level teachers' utilization of data-driven instruction as a tool to improve student learning, the following research questions were explored with teachers at a middle school in Southern California:

1. Do teachers perceive data-driven instruction to be helpful in improving student performance?
2. When using data-driven instruction, how frequently do teachers use various types of data?
3. What methods do teachers use, if any, to modify their instruction based on student data?
4. Are teacher instructional practices, as it pertains to data-driven instruction, related to how long they have been teaching and the number of students they teach each week?
5. Are teacher instructional practices, as it pertains to data-driven instruction, related to the teacher's primary subject?

Importance of the Study

With the advent of accountability, high-stakes testing, and standards-based reform, middle schools are required to produce

increased student achievement and success. As a result, teachers must learn to use data collection and data-driven instruction to drive their instructional decisions in order to improve student academic achievement (Lafee, Dawson, Alwin, & Yeagley, 2002).

According to Johnson (2002), data can help schools and districts to make informed decisions about teacher instruction, intervention programs, and any other problems that need addressing for the students' benefit.

> Careful analysis of data helps us to dig deeper. Often, perceptions of what is working are based on weak indicators, such as whether people "like" an idea or program director, rather than on whether the practice is leading to higher student achievement. Examining the impact of school or district practices can provide a sounder basis for decision-making and can crystallize what needs to happen next. (p. 36)

At the time this study was initiated, much of the literature was general and or more to high school data-driven instruction; less research existed specific to middle school. Therefore, the findings of this study might be helpful to middle school teachers in order to increase student academic achievement.

Definition of Terms

The following terms are used throughout this study:

- Aggregate Data: Data for the total group, such as a school or district (Johnson, 2002).
- Adequate Yearly Progress (AYP): A statewide accountability system that requires each state to ensure that all schools and districts make progress toward established benchmarks (California Department of Education, 2003).
- ANOVA: A One-Way Analysis of Variance (ANOVA) is a way to test the equivalence of three or more means at one time by using variances (Creighton, 2007).
- California Standardized Test (CST): A measure of California students' progress in English, math, science, and history (California Department of Education, 2003).
- Combination Class: Any class where the teacher teaches more than one subject to a set of students (Johnson, 2002).
- Data-Driven Instruction: Using data to monitor student progress and make specific instructional decisions based on student outcome (Lashway, 2002).
- Disaggregated Data: Data broken down into student subgroups such as race, gender, or ethnicity, as well as subsets of a particular subject (Henke, 2004).
- Formative Assessments: Assessments given periodically to gain information on what students have learned to guide future lessons (Garrison & Ehringhaus, 2007).

- Periodic Assessments: Assessments given quarterly by school districts to measure student mastery of specific grade level standards (Education Commission of the States, n.d.).
- Portfolio: A collection of student work that exhibits the student's achievement in one or more subject areas (Leahy, Lyon, Thompson, & William, 2005).
- Reteach: To teach again using different strategies, such as small group instruction, retesting, peer tutoring, or other strategies (Young, 2006).
- Spearman: A measure of dependence between two variables (Creighton, 2007).
- Student Achievement: The progress, or lack thereof, that a student makes toward mastery of grade level content and performance standards (Balfanz et al., 2002).
- Summative Assessments: Assessments given at the end of a learning period to determine student performance (Lafee, et al., 2002).
- Veteran Teacher: According to Webster's Dictionary, a veteran is someone who has a lot of experience in a particular activity, job, etc. For the purpose of this paper, a veteran teacher will be defined as someone who has been teaching for a minimum of 10 years (Goldman, 2013).

Delimitations

The researcher conducted this study at one middle school campus in Southern California. All 51 teachers at the school were invited to participate in the study. An online survey with nine questions was administered during a single faculty meeting and also kept open for 2 weeks to allow others that were not present at the meeting to participate.

The researcher's original intent was to include another middle school in the study. Great effort went into pursuing schools that met the study's criteria. The researcher reached out to middle schools in Southern California and attempted over time to encourage participation. However, the schools were not forthcoming over a period of time. Therefore, due to time constraint, the researcher moved on.

Limitations

Forty of the 51 middle school teachers participated in the study. Eleven of the teachers did not participate because they were away on a field trip. Of the 40 middle school teachers that participated in the study, only 30 responses were received for this study due to unknown circumstances. Possible reasons were that teachers withdrew, did not complete the survey, or technical difficulties. Participation in this study was limited due to the researcher only soliciting participants during one faculty meeting in which the teachers were asked to complete an

online survey. The survey was kept open for 2 weeks for those 11 teachers who did not participate. No time parameters were given to the participants with regards to completing the survey, however there was a 2 week window for them to take the survey Participants were told that they did not have to answer all survey questions and that they could withdraw from the survey at any time. There were no identifying marks that would give any of the subjects' information away. The identity of all participants remained confidential and anonymous.

The findings of this study are not necessarily generalizable due to the small sample. However, the results of this study might be applicable to how teachers perceive data-driven instruction to be helpful in improving student performance, how frequently teachers use various types of data when engaging in data-driven instruction, and what methods teachers use, if any, to modify their instruction based on student data. The results might also be applicable to schools with similar demographics, faculty, and context. This study was limited to teachers' views and self-reports of how they use data-driven instruction to modify their instructional delivery in order to improve academic achievement among middle school students.

Assumptions

This study also assumed that using the results of data-driven instruction in the classroom delivery is critical in order for teachers to improve student achievement. Another assumption is that teachers in this study would be honest and accurate with their responses. Finally, the researcher assumed that participants are professionals and were knowledgeable about their instructional practices and how they use data-driven instruction.

Conceptual Framework

The particular model that framed this study is the Conceptual Framework of Data-Driven Decision Making in Education. This model includes the types of data that inform instruction; the data then become information based on analysis and summary, and the information becomes actionable knowledge, which then influences the types of decisions made based on the information gathered (Marsh, Pane, & Hamilton, 2006). Chapter two will explore this model in greater depth.

Summary

This quantitative survey study is organized into five chapters. Chapter One provided an introduction to the study. Educators are known for making reforms when politics and economics drive them to do so, from the first implementation of the Elementary and Secondary Education Act (ESEA) to the recent

changes mandated by NCLB. Teachers are often skeptical of the changes that are asked of them, especially when they do not see any results. With the continued push for data-driven instruction, it will be difficult to achieve 100% teacher buy-in. However, by showing teachers that data-driven instruction can be effective in increasing student achievement; more teachers are likely to adopt the practice of using data-driven instruction in their classrooms.

Chapter Two of this study presents a review of the literature related to the importance and effectiveness of data-driven instruction, which includes using data-driven instruction to improve student achievement, the history of data-driven instruction, the conceptual model, accountability, implementing data-driven instruction, combatting the fear of data-driven instruction, using various types of data to modify instruction, and a summary of the literature review. Chapter Three discusses the research design. Chapter Four reports the study findings and Chapter Five presents a discussion of the findings and conclusions and makes recommendations for policy, practice, and future research.

Chapter Two: Literature Review

The latest emphasis in the field of education has involved a massive push toward increasing accountability among districts and schools (Oberman, Arbeit, Praglin, & Goldsteen, 2005). In the 21st century, schools across the U.S. are being held to higher standards than ever before in the history of public education. States are requiring students to perform at higher levels and teachers are being held accountable for their students' achievement rather than merely the delivery of instruction. Even as President Obama is making changes to NCLB, it is still mandatory for schools to meet the requirements of student improvement in both math and reading. As a result of NCLB, state-mandated accountability systems have been implemented throughout schools and school districts; it is now a requirement for schools to scrutinize their students and the academic progress they are making (California Department of Education, 2003).

Using Data-Driven Instruction to Improve Student Achievement

Schools are now obligated to make sure every child is making academic gains; schools can no longer carry on blindly with students who are not showing gains or are producing fewer gains. Unfortunately, even though NCLB was implemented to close the achievement gap for minority students, an achievement gap still exists between African-American and Hispanic students and

their Caucasian and Asian American counterparts, especially in middle school. Schools still need to research ways to close the achievement gap. According to Darling-Hammond (2010),

> In addition, inequality has an enormous influence on US performance. White and Asian students score just above the average for the European OECD nations in each subject area, but African-American and Hispanic students score so much lower that the national average plummets to the bottom tier. (p. 1)

Due to the current inequality of education and the push to close the achievement gap, data-driven instruction has begun to flourish in this new environment of state and federal requirements, with widespread agreement that measuring student progress and setting specific goals are fundamental to school improvement (Schmoker, 1999). Consequently, data-driven instruction has become a major focus in schools across the nation as a form of accountability. Data-driven instruction has been implemented in schools to boost student academic skills due to the implementation of NCLB and its accountability reforms (Datnow et al., 2007). According to recent research, schools that implement data-driven instruction as part of their instructional routine are able to boost student achievement and, more specifically, increase the scores of low achieving students (Leahy, Lyon, Thompson, & William, 2005). Teachers,

administrators, and parents are increasingly seeing the value of data-driven instruction as a way to change or improve instruction, which will inevitably improve student achievement.

The History of Data-Driven Instruction

Data collection has been a part of school policy for many years. Schools have historically collected data on attendance, ethnicity, and assessments. Before the Star Test and the CST, teachers collected data using various forms of assessment such as the California Test of Basic skills (CTBS), the Terra Nova, and the IOWA test.

> Data collection in schools is not a new concept. For years, districts have collected a vast array of student and institutional information, including such items as test scores, enrollment data, budget and finance information and human resources data. (Messelt, 2004, p. 2)

As a result, school districts and administrators have been making an effort to develop ways to report data in a sufficient and timely manner.

NCLB has had a profound effect on schools nationwide, as it has increased interest in and awareness of student performance data. School administrators are now being held accountable for monitoring student and teacher performance improvement. Because of NCLB's mandates, nearly all states and districts have created and implemented a data management system. Unfortunately, most of

the data management systems that have been implemented make it difficult for teachers to retrieve and analyze their data in a timely fashion (Messelt, 2004).

Following the implementation of NCLB, many schools and districts have begun using data-driven decision making as a means to inform and advance use of technology to collect and analyze data, increasing their ability to make informed decisions based on data rather than theory. Many schools and districts are struggling with budget cuts and limited resources, forcing them to make difficult decisions, eliminate positions, and cut programs that are essential to student achievement (Messelt, 2004).

Data-driven instruction can be valuable to administrators and teachers because it can show evidence of student achievement and allow student attendance to be analyzed, which in turn can help teachers understand why particular students are not doing well academically. The data can explain other phenomena, such as the number of disciplinary incidents occurring in a week or month and the effectiveness or ineffectiveness of implemented programs. Data-driven instruction has given schools and districts the opportunity to share a wealth of information with teachers, parents, and students. At present, districts and schools can now make more informed decisions, which can increase student achievement and improve schools overall (Messelt, 2004).

Conceptual Framework of Data-Driven Decision Making in Education

This particular model was chosen to frame this study in that it suggests how data informs instruction and shows how data-driven instruction can be used. Data-driven instruction can positively influence instruction to improve student achievement. Figure 4 provides a conceptual framework showing how data-driven instruction should be used in the classroom (Marsh et al., 2006).

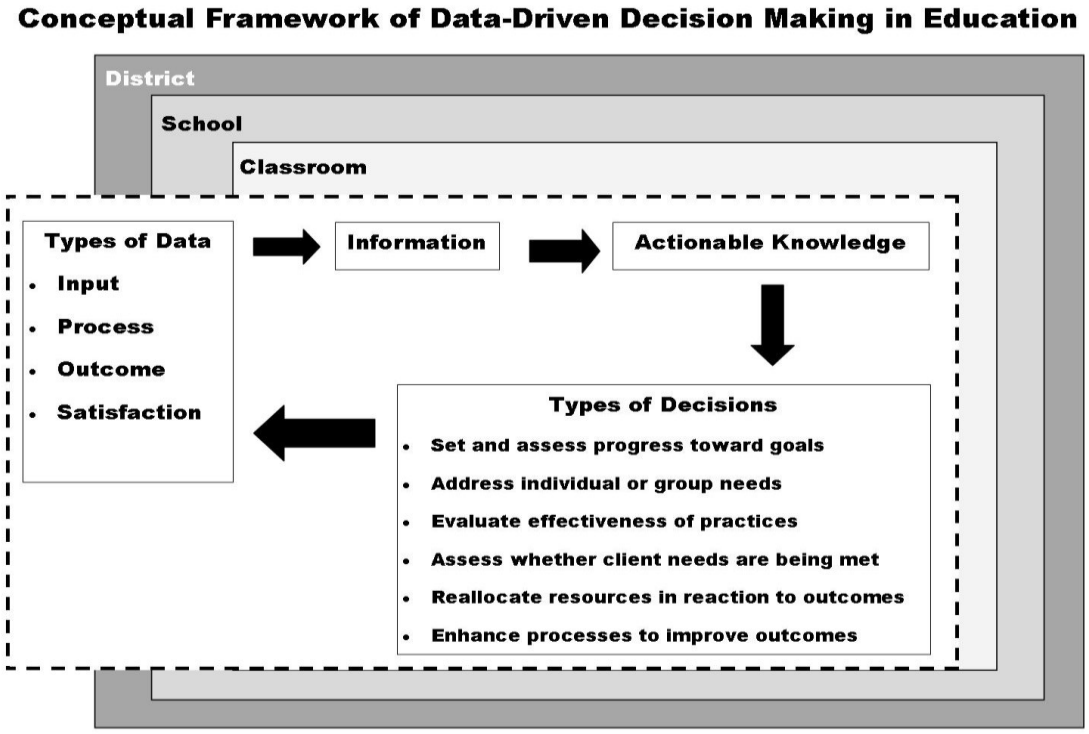

Figure 4. Conceptual framework of data-driven decision making in education: 2006. From *The Rand Corporation 2006: Making Sense of Data-Driven Decision Making in Education,* by J. A. Marsh, J. F. Pane, & L. S. Hamilton. Retrieved from www.rand.org. Copyright 2006 by the Rand Corporation. Adapted with permission.

Factors that influence this model include types of data that teachers can use in order to inform decisions, such as input, process, outcome and satisfaction data. Once the data are collected, teachers must analyze them in order to gather information. After the information is gathered, the data then become actionable knowledge that informs the teachers' decision regarding what steps to take next. Finally, teachers must make various decisions in order to achieve student success, such as setting goals for students, reassessing, or determining whether to address individual or group needs (Marsh et. al, 2006).

Accountability

The standards and accountability movement requires school and district leaders to start thinking differently about educational decision-making and to begin to use data to make decisions about everything from instructional programs to interventions to budget allocations. "Data based decision-making and the use of data for continuous improvement are the operating concepts of the day" (Mitchell, Lee, & Herman, 2000, p. 22)

With a need for increased student achievement, data use has become the driving force behind the creation and implementation of NCLB (Yao, 2009). NCLB was designed to bring accountability to districts and schools in order to ensure that they are improving student outcomes (California Department of Education, 2003). In the past, it was not required for schools or districts

to demonstrate success and they did not suffer any consequences if students showed no improvement. As a result, many students who attended school before NCLB perceive that they received a sub-par education, especially low-income, Hispanic, and African-American students, with their Caucasian and Asian American counterparts having more success academically. According to Johnson (2002),

> Despite countless school reform efforts during the last two decades of the 20th century, we begin the 21st century with continuing gaps in academic achievement among different groups of students. The gaps in achievement appear by income and by race and ethnicity. (p. 4)

As a whole, since the beginning of the 21st century, American society began to feel that education was letting the nation's children down by not creating well-educated, law-abiding adults. The idea of giving all students an equal education has become a reality as a result of the implementation of important laws and rulings, such as ESEA and *Brown v. Board of Education*, as well as the adoption of NCLB and its new strict accountability requirements for schools and districts (Darling-Hammond, 2010).

NCLB was established to make sure that all schools would be held accountable for student achievement because all children have the capacity to learn regardless of their socio-economic

status, gender, or race. Recently, President Obama reauthorized the ESEA, in which he re-emphasized the importance of accountability and turning around underperforming schools (U.S. Department of Education, Office of Elementary and Secondary Education, 2002).

According to Johnson (2002), "The goals, standards, and long-term outcomes for students are important and must be clearly stated so they are measurable" (p. 10). Recently, schools and districts have begun to understand the importance of data use. More and more schools are implementing data analysis as a tool to help students become successful academically. When used effectively, data can help schools to better identify students' strengths and weaknesses. Teachers, parents, and students can use such data to help set more accurate goals and outcomes. The implementation of data-driven decision-making ensures that fewer students are left behind.

Many schools believe they are implementing data-driven decision making accurately. However, in their research, Ikemoto and Marsh (2007) found otherwise. The researchers created four categories of data-driven instruction: simple data and simple analysis, simple data and complex analysis, complex data and simple analysis, and complex data and complex analysis. The results of this study indicated that even if a school believes it is implementing data-driven decision-making, it may not be

making the most of the data and implementing it in the optimal way for achieving student success because of lack of training and communication among staff. Yao (2009) asserted, "As a whole, there needs to be more communication and training on what DDDM (Data Driven Decision Making) process consists of and how it can be utilized to its greatest potential and benefit for students" (p. 13).

Data-Driven Instruction

In order for data-driven instruction to be implemented into schools or districts successfully, teachers and administrators need to understand that many factors need to be considered in order for it to work effectively. When implemented successfully throughout the schools in a district, data-driven instruction results in noticeably improved student academic achievement.

The practice of data-driven instruction starts with a question or questions that teachers and administrators develop to gather information from the data. The information will help answer the question or questions created by the faculty. For example, teachers and administrators can pose a question such as, "What is the percent of students that were proficient or advanced on the state test?" or more specifically, "What percentage of African-American students were proficient or advanced on the state test?" The question(s) asked can either create new data, or data that have been collected previously can

be used to answer the question(s). After the data have been collected, it is important for teachers and administrators to then analyze the data to look for strengths and weaknesses. Creating questions and analyzing the data will help schools prioritize decisions about actions that need to be taken in order to ensure student success. Hopefully, schools and districts will use data-driven instruction as a continual process to help students be successful academically. The data-driven instruction process will benefit teachers and administrators by helping them make informed decisions about interventions or programs that need to be implemented if teachers are willing to devote time to analyzing data. If teachers are involved in the practice of data-driven instruction, they will most likely make more informed decisions that will benefit their students rather than just using their instincts (Ingram, Louis, & Schroeder, 2004).

Implementing Data-Driven Instruction

Many schools have acclimated to the idea of implementing data-driven instruction and, as a result, have seen a marked improvement in student achievement. Several recent studies have shown how schools that have implemented data-driven instruction successfully have been able to improve student outcomes (Datnow et al., 2007). This section will focus on how the tools these

schools used have created successful results in improving student achievement.

To implement data-driven instruction practices successfully in districts or schools, it is important to ensure that teachers, parents, and all staff are invested in the process. It is also important to proceed in the following stages: (a) creating a leadership team, having staff generate questions about student achievement; (b) creating objectives and goals based on the questions; (c) deciding what type of data is needed to answer the questions and how the data will be collected; (d) disaggregating the data; (e) deciding how the data will be analyzed; (f) deciding how the data will be shared; and (g) creating solutions and action plans based on the data (Johnson, 2002).

Schools that implemented data-driven instruction successfully demonstrated that creating objectives and goals based on staff-generated questions helped to create a culture of inquiry. The staff members at these successful schools were limited to asking only a few questions about the data and the questions were then ranked from 1–5, 5 being of the utmost importance. After the data were gathered, the leadership teams from these schools then decided how best to implement the strategies for the data analysis process. The staff members of these successful schools felt that by creating goals and

objectives they were able to hold accountable not only administrators and teachers, but also parents and students. Goals were created to be school-wide so that everyone was aware of what direction the school was taking, giving everyone a focus and objectives (Johnson, 2002). The schools also created goals for entire classes of students or individual students who might need intervention or extra guidance, with the help of teachers and parents. The faculty created goals for parents so they could participate in the enhancement of student achievement. Also, teachers created goals for themselves so they could hold themselves accountable and continue to grow through collaboration and professional development (Datnow et al., 2007).

After questions have been generated about student achievement and goals and objectives have been created, the next stage will involve the collection of data. Administrators will train teachers to look for evidence of student growth or academic achievement. They will also collect data that show student weaknesses in core subjects and look for reasons why students might be struggling academically, such as excessive truancies and absences. They may use tools such as Microsoft Excel to make collecting data easier and simpler (Johnson, 2002).

After the teachers have collected the data, it will then be necessary to disaggregate the data. Many districts and schools are required to disaggregate their data by race/ethnicity, socio-economic status, English Language Learner (ELL), and Special Education subgroups. Some people feel that disaggregating data can be harmful to certain subgroups because it can create biases or labels for underachieving subgroups. However, by disaggregating and analyzing the data, the underachieving subgroups can then be helped to achieve greater success (Johnson, 2002).

Once data have been collected and disaggregated, it is then necessary to analyze and interpret the data. It is important to create a system to interpret the data by using programs such as Microsoft Excel. This system will then be used to identify connections between such factors as grades and assessment scores, subgroup achievements, and attendance, to name a few. Using technology as a tool to collect and interpret data can make data collection and interpretation simpler and help teachers and administrators present the data in a confident and knowledgeable way (Johnson, 2002).

Schools that increase student achievement by implementing data-driven instruction create a school-wide curriculum in which teachers collaborate in making timelines and assessments so that each grade level will be studying the same topic at the same

time. This procedure allows students to transfer easily from one teacher to another for any reason without missing any core academics. Teachers also have the ability to collaborate with each other on student strengths and weaknesses based on the school-wide curriculum. Developing school-wide curricula and assessments creates a stronger base in which data-driven instruction can be successful. Teachers, students, and administrators will be able to see that by using data-driven instruction, teachers are able to share students' strengths and weaknesses with them and have the students create goals for themselves. Data-driven instruction will also help teachers to create goals for themselves based on student success (or lack thereof) on school-wide assessments (Datnow et al., 2007).

It is also important that students, parents, and teachers create a plan for using data-driven instruction to which they can all agree. Without teacher, student, and parent buy-in, data-driven instruction cannot be successful. Teachers have to agree that all students have the ability to learn and pledge to do their best to ensure that all students are successful. They must use data to improve or maintain student academic success and agree to collaborate with each other, communicate with parents, and conference with students to discuss successes or weaknesses. Administrators also have to agree to make sure teachers receive training and professional development on data-

driven instruction and be patient and supportive while teachers are in the process of implementing data-driven instruction. By creating these expectations, along with teacher buy-in, schools should be able to implement data-driven instruction successfully (Datnow et al., 2007).

When the school has built a strong foundation of data-driven instruction among its staff, districts, and schools, schools need to research ways in which the data can be made easily accessible and manageable (Marsh et al., 2006). "With an increased use of data, there is a greater need for all data to be in a central database from which educators can access the information easily" (Yao, 2009, p. 18). Research has shown that if teachers have the ability to retrieve data easily and in a timely manner, they are more likely to use it (Erickson, 2007). Furthermore, the leadership team that is created should be given the responsibility of managing the central database of information and making sure it is updated and accessible to teachers (Datnow et al., 2007).

It is important for teachers to participate in professional development, but teachers having time to collaborate is another essential element in the success of data-driven instruction (Walsh Symons, 2003). When teachers are given the opportunity to collaborate, they are able to analyze the data results together, discuss their students' strengths and weaknesses

collaboratively, problem-solve, and support each other (Young, 2006). Providing time for teachers to collaborate will help sustain the culture of inquiry and the use of data-driven instruction.

Breaking the Fear of Data-Driven Instruction

Implementing data-driven instruction at a school site takes time, energy, motivation, and resources, as well as adjustments to school practices, schedules, and school culture (Halverson, Prichett, & Watson, 2007). Many changes will have to occur as the school begins to focus on data-driven instruction. Inspiring teachers to use data-driven instruction and implement it in their classrooms can be a challenge. Many teachers fear data because of their lack of knowledge on the topic, because they do not know how to use it, and because they fear what the data might say about their teaching in comparison to other teachers (Mason, 2002). With the implementation of NCLB, and now with a greater push for accountability from the Obama administration's Race to the Top initiative, schools and districts are feeling more pressure to perform at an even higher level. Many teachers feel that, given this new accountability and initiative, they will be blamed if their students are not as successful as others after implementing data-driven instruction in their classrooms. Teachers need to be reminded that implementing data-driven instruction can have positive outcomes, such as improving

student academic success as well as their teaching. They also need to be told that results, whether positive or negative, will not be used against them; instead, teachers can use the data to set goals for themselves (Ormrod, 2006).

Many teachers possess an inherent mistrust of data (Ingram et al., 2004). Teachers need to learn to trust the reliability of the data they collect or are given. Many teachers will question the results if they feel that it has been skewed. They will question whether or not a student should have received a score based on his/her ability to learn the subject, absences, or whether or not the assessment reflects the standards taught (Marsh et al., 2006). Teachers need to learn how to read and understand the data and build confidence in their ability to use it. Once teachers have confidence in data-driven instruction, the desire to implement it will come naturally.

Furthermore, teachers need to be given adequate training in order to build confidence that they can analyze the data appropriately. As mentioned previously, when teachers are confident, they will be able to generate questions, create goals and objectives, collect data, disaggregate the data, analyze the data, collaborate with others, and input the data into a central database to refer back to when necessary (Johnson, 2002).

Use of Various types of Data to Modify Instruction

After teachers have built confidence in their use of data, the next step is to have teachers use the data to drive their instruction. Teachers use many forms of assessments that fall under the category of either formative or summative assessment. Formative assessments are continuous assessments, observations, and evaluations that classroom teachers complete in order to improve and differentiate their instruction (Johnson, 2002). Teachers tend to use formative assessments more regularly than summative assessments. Teachers commonly use formative assessments because they find them easier to analyze when using data-driven instruction to improve student achievement. Examples of formative assessments include quizzes, tests, essays, and student portfolios (Garrison & Ehringhaus, 2007).

In contrast, teachers generally use summative assessments as placement guides in order to place students in particular programs such as intervention or gifted/talented programs. The main goal of summative assessments, however, is to evaluate student success when the academic school year is complete. Examples of summative assessments include the California Standards Test (CST), final exams, and periodic assessments (Garrison & Ehringhaus, 2007).

Training teachers to use various types of data is very important. Teachers must learn which data to use, how often to use the data, and how to analyze the data (Datnow et al., 2007).

As mentioned before, it is necessary for teachers to receive training on how to use results in their teaching. Morrison (2008) noted, "… if teachers are ever to use data powerfully, they must become the coaches, helping themselves and colleagues draw on data to guide student learning, find answers to important questions, and analyze and reflect together on teaching practice" (para. 3). Along with training, many schools use collaboration as a tool to help teachers incorporate data-driven decision making into their instruction. Teachers normally come from a culture of isolation where they make their own decisions about what to teach, when to teach it, and how to assess it. Some teachers fear change and resist it (Mason, 2002). When teachers collaborate with each other, they discuss such topics as standards that need to be covered, students' weaknesses and strengths, and professional developments that are necessary to help analyze the data. "By working together, teachers can share ideas, tools, and strategies that they have already used so that each teacher doesn't have to do it on their own" (Yao, 2009, p. 23).

One of the biggest problems that schools have in implementing data-driven instruction is creating time for

teachers to analyze the data and revise their classroom instruction appropriately. Data-driven instruction can be a time-consuming process when implementing it for the first time.

Another problem schools may have is getting veteran teachers to participate in data-driven instruction successfully. Many veteran teachers feel that data is not necessary in order to assess student' needs. In a study done in the American Journal of Education, Young (2006) found that veteran teachers felt they knew best when it came to what their students needed academically and did not need testing to guide their instruction. One veteran teacher commented that the only assessment that she felt was effective was a fluency test given to gauge a student's comprehension level. Otherwise, she would use her judgment based on what she heard and observed while they read.

Getting teachers to trust their ability to implement data-driven instruction, building their confidence, persuading veteran teachers that utilizing data is important, and getting them to implement data usage in their classrooms can be a lengthy process.

> With schedules that are already impacted, administrators and teachers need to invest a lot of time to build a desire for data use, to trust data, to find ways to make data easily accessible and available in a timely manner, to

> train teachers how to analyze data and apply knowledge for use in the classroom, and to collaborate with colleagues. (Yao, 2009, p. 23)

Many teachers already feel overwhelmed with lesson planning, grading, and meeting with parents. Administrators have to be patient and supportive when implementing data-driven instruction in schools. Administrators need to help teachers find time to implement data-driven instruction by either having shorter school days (which many schools have already been implementing for the past few decades), holding professional development before school begins, or hiring substitutes for each grade level once a month (NAESP, 2011). By making sure that teachers are trained properly on how to analyze the data and are given time to implement data-driven instruction, the school communicates to the teachers that the school finds data important (Datnow et al., 2007).

Summary of Literature Review

Data-driven instruction has been at the forefront of federal, state, and local accountability agendas to improve student achievement since the implementation of NCLB. NCLB has required high-stakes testing, accountability, and the use of data, providing additional incentives such as funding for schools and districts to make use of data as a part of their regular routine (Marsh et al., 2006). Data-driven instruction is

becoming fundamental in schools in order to increase student achievement for all students. Schools across the United States are beginning to realize that carefully collected and analyzed data represent the key to improvement in education (Wade, 2001).

Many schools are beginning to use data as a reform measure. Using data collection and analysis, school districts can become more informed and assured about the progress and impact of their programs and policies while teachers can become more informed about their instruction and methodologies. Examining how data-driven instruction is used to influence instructional practices can elucidate which interventions are effective and target the causes of poor student achievement. With the use of data, educators can gain knowledge and confidence to respond proactively rather than reactively to accountability demands (Johnson, 2002; Supovitz & Klein, 2003). A fundamental element of school improvement efforts is the understanding and use of data that show the connections among school dynamics, instruction, and student performance. However, schools cannot successfully use data immediately. Teachers need time, training, and practice in order to use data to improve their instruction and increase student achievement. As with any new concept, it may take teachers a few months to master their data analysis skills in order to improve their instruction.

Many obstacles are blocking data use at present, such as teacher resistance, inconsistencies in the technological infrastructure, and a shortage of trained personnel at individual sites that have the ability to complete the necessary data collection and analysis. A common myth among teachers who oppose data collection and analysis is the notion that using data is a burden and of no use or importance. Many teachers who oppose data-driven instruction will give the excuse that they already know their students well and do not need to collect and analyze data in order to inform their instruction. However, teachers will welcome data-driven instruction when they feel it is useful to them or is mandated by a higher authority such as NCLB.

Schools that are able to engage teachers and sustain data-driven instruction must create an environment in which data are used in their daily routine. Teachers obtain the greatest benefit from using data consistently as a way to guide their instruction, using information that is pertinent to their daily practice and linked to their specific instructional objectives and goals. These factors are significant components of being able to sustain data use to support decision-making and continuous improvement efforts in instruction and student achievement. The implementation of a data-driven instruction initiative requires a cultural shift in thinking, as well as the

execution of organizational change. Having a collective vision developed by teachers, parents, and staff is fundamental in order to create an environment for data-driven instruction.

Chapter Three: Methodology

Purpose of the Study

In an era of high-stakes testing, middle school teachers must rely on data in order to make informed decisions about the best strategies to improve student learning. Strengthening middle school level instructional practices by examining assessment data that influences middle school teachers' instructional decisions is essential in order to support programs for middle school students and prepare them for the rigor of high school.

The purpose of this study was to investigate whether data-driven instruction affects or informs strategies that middle school teachers use in their planning, teaching strategies, and assessments, and to explore whether teachers use these data in order to make changes in their classroom instruction. In addition, this study examined the type of data middle school teachers use to inform their instruction and whether or not they find it useful. This chapter will focus on the quantitative design that was used to conduct this study. The researcher chose to study a middle school in Southern California to help answer the study's research questions.

Research Questions

In order to develop an increased understanding of middle school teachers' utilization of data-driven instruction as a

tool to improve student learning, the following research questions were examined:

1. Do teachers perceive data-driven instruction to be helpful in improving student performance?
2. When using data-driven instruction, how frequently do teachers use various types of data?
3. What methods do teachers use, if any, to modify their instruction based on student data?
4. Are teacher instructional practices, as it pertains to data-driven instruction, related to how long they have been teaching and the number of students they meet each week?
5. Are teacher instructional practices, as it pertains to data-driven instruction, related to the teacher's primary subject?

Methodology

This quantitative survey design study examined whether data-driven instruction affects teacher instruction and student academic achievement, and explored whether the types of reteach strategies teachers implement are based on class size, teacher experience, and subject taught. Quantitative research entails collecting conclusive data, such as numerical data, so it can be examined in a scientific method and considered to be unbiased (Creswell, 2003).

The survey design was chosen in order to receive timely responses, which enabled the researcher to collect data faster. The survey design is also beneficial because data can be collected from a large population rather than single individuals. The data were collected using a nine-question online survey hosted by eSurveyPro.com that was given to teachers at a middle school in Southern California.

Population

The study was conducted among teachers at a middle school in Southern California. The population being surveyed was all sixth, seventh, and eighth grade teachers at the school. The school had 51 teachers; only 40 teachers took the online survey, but there were only 30 responses received. Out of the 30 respondents, 22 or 73% of the teachers were veteran teachers, 6 teachers taught combination classes, seven were math teachers, 10 were English teachers, and 7 taught other subjects.

The student population at the middle school consisted of 746 students. Of that, 72% were Hispanic, 14% were White, 5% were African America, 4% were Asian, and 1% were American Indian/Alaskan Native. Seventy-seven percent of students qualified for free or reduced lunch. The ELL population made up about 25% of students and over 50% of the students were socioeconomic disadvantaged.

The school had an API score of 752 for 2013 school year, and has steadily increased over time. Within the subgroups, African Americans had an API score of 748, Hispanics a score of 738, Whites a score of 805, ELL population a score of 672. There were no scores posted for Asians or American Indians because the population size was too small (Great Schools, 2014).

Northwest Middle School in Salt Lake City, Utah, which also consists of a majority population of minority students, and whose population was similar to the middle school where the study was done, touts an increase in state scores by using data-driven instruction. They were even praised by U.S Secretary of Education, Arne Duncan, for their improvement in academic success (Wood, 2013).

The school's population includes 69% Hispanic students, 14% White, 6% Pacific Islander, 5% African American, 4% Asian, and 2% American Indian. 94% of their student body qualifies for free and reduced lunch (Great Schools, 2013).

Their academic success consists of seventy-nine percent of their students scored proficient in math, up from 37% in 2010, 58% of their students scored proficient in science, up from 38%, and their reading levels have improved from fourth grade to seventh grade (Wood, 2013).

Survey Instrument

This quantitative study was administered through an online survey via eSurveyPro.com. The survey consisted of nine questions (Appendix D) created by the researcher in order to gather information on teachers' data use in their classroom, whether the data informed their instruction, and what reteach methods they used in order to increase academic success.

Human Subjects Consideration

This study involved human subjects. In agreement with Pepperdine's Institutional Review Board (IRB) policy, human subjects cannot be identified directly or indirectly through other means linked to the human subject (Pepperdine University, 2009). The possibility of a human subject being identified was decreased through the following procedures: (a) the participants' names and school names were not used in this study, and (b) the participants were asked to sign a consent form informing them that participation was voluntary and that they had the right to not participate or to withdraw their participation at any time during the study. The results of the study will be made available for the participants to examine at the end of the study for up to 1 year.

Data Collection

The researcher sought approval from Pepperdine University's IRB, which approved the researcher's request. The researcher

then sent out a letter to the principal to explain the purpose of the study and to request permission to conduct the study at the school site.

The request was approved by the principal and the researcher sent out letters and consent forms to teachers, requesting them to complete an online survey and informing them that the survey would be confidential and anonymous. Teachers were asked not to give their names during the survey process. All data collected was kept confidential and locked in a file cabinet in the researcher's home. The researcher will have sole access to the data, which will be destroyed after 5 years.

Data Analysis

The alpha level for this study was set at $p = .05$ using the Spearman scale. The Spearman scale was used based on the small size of the population results. However, due to the exploratory nature of this study, findings significant at the $p = .10$ level are noted to suggest avenues for future research. As shown in Table 1, data were tabulated initially using standard summary statistics (means, standard deviations, frequencies, and percentages) with those results being used to answer the first three research questions. For research questions two and four, demographic items (experience teaching and number of students seen per week) were correlated with the teachers' responses to survey items 3-9. Descriptive statistics, Spearman correlations,

and One-Way Analysis of Variance (ANOVA) were the statistical approaches used to analyze the responses given by the teachers.

Table 1

Data Analysis Plan

Research Question	Survey Items (Appendix A)	Statistical Approach
1. Do teachers perceive data-driven instruction to be help in improving student performance?	4, 5, 6, 7	Descriptive statistics
2. When doing data-driven instruction, how frequently do they use various forms of data?	8	Descriptive statistics
3. What are the methods that the teachers are using, if any, to modify their instruction based on student data?	9	Descriptive statistics
4. Are teacher instructional practices, as it pertains to data-driven instruction, relate to how long they have been teaching math and the number of different students they meet each week?	1, 2 compared to 4 to 9	Spearman correlations
5. Are teacher instructional practices, as it pertains to data-driven instruction, related to the teacher's primary subject taught?	3 compared to 4 to 9	One Way ANOVA ETA Coefficients

In order to ensure that the level of discomfort would be minimal and the participants would have time to complete the survey, the researcher conducted a pre-pilot with three volunteer veteran teachers who have all taught a minimum of 10 years and a maximum of 30 years. All three teachers were able to complete the survey within 20 minutes.

Chapter Four: Key Findings

The purpose of this study was to investigate whether data-driven instruction affected or informed strategies that middle school teachers used in their planning, teaching strategies, and assessments, and to explore whether the teachers used these data in order to make changes in their classroom and instruction. Responses from 30 teachers were used for this study.

Table 2 displays the descriptive statistics for selected variables. For these 30 teachers, their years of experience teaching middle school ranged from 0-30 years (M = 12.97, SD = 6.88). The number of students seen in a typical week ranged from eight to 300 (M = 120.37, SD = 58.81; see Table 2). The most common subjects taught were English (33.3%) and Math (23.3%) with another 20.0% of the sample teaching a combination of subjects and an additional seven teachers (23.3%) teaching "other" subjects (see Table 3).

Research Question 1

Research Question 1 asked, "Do teachers perceive data-driven instruction to be helpful in improving student performance?" This question was answered based on data shown in Tables 2 and 3. In Item 1, teachers were asked how many years they taught middle school; their responses ranged from beginning teacher to a 30-year veteran teacher. Twenty-two (73%) of the teachers had taught 10 or more years. In Item 2, teachers were

asked how many students that they taught in a week. The answers ranged from 8 to 300 students. The average class size was 120 students. In Item 4, teachers were asked about the percentage of students they estimated to have shown acceptable levels of growth on the CST since last year. Teachers decided what they felt was acceptable levels of growth. Their responses ranged from 10-90% (M = 53.37, SD = 19.83). In Item 7, teachers were asked about their perception of what percentage of their colleagues regularly used data to modify their instructional practices. Those estimates ranged from 10-90% (M = 56.17, SD = 22.46; see Table 2).

Table 2

Descriptive Statistics for Selected Variables

Variable	*M*	*SD*	Low	High
1. Years teaching middle school	12.97	6.88	0.00	30.00
2. Number of students each week	120.37	58.81	8.00	300.00
4. Percentage of students estimated to have shown acceptable levels of growth on the CST since last year.	53.37	19.83	10.00	90.00
7. Percentage of colleagues estimated to regularly use data to modify their instructional practices.	56.17	22.46	10.00	90.00

Note. N = 30

Teachers were asked whether they had seen statistically significant improvement in student academic achievement by utilizing data (Item 5). Fifty-seven percent of the teachers

responded "mostly yes" or "definitely yes." Teachers were also asked if they felt that using data was essential to improving student academic success (Item 6). Eighty-three percent of the teachers responded "mostly yes" or "definitely yes" (see Table 3).

Table 3

Frequency Counts for Selected Variables

Variable	Category	*n*	%
3. Primary Subject	Math	7	23.3
	English	10	33.3
	Combination	6	20.0
	Other	7	23.3
5. Seen useful amounts of improvement in student academic achievement by utilizing data	Mostly no	1	3.3
	Sometimes yes or no	12	40.0
	Mostly yes	10	33.3
	Definitely yes	7	23.3
6. Feel using data is essential to improving student academic success	Mostly no	1	3.3
	Sometimes yes or no	4	13.3
	Mostly yes	16	53.3
	Definitely yes	9	30.0

Note. $N = 30$

Research Question 2

Research Question 2 asked, "When using data-driven instruction, how frequently do teachers use various types of data?" Table 4 displays the descriptive statistics for the frequency of usage of various forms of data sorted by the highest mean rating. These ratings were based on a 6-point metric: 1 = *Never* to 6 = *Almost every day.* Most frequently used forms of data were Survey Item 8b, "class work" ($M = 5.63$), and

Item 8a, "classroom assessments" (*M* = 4.47), whereas the least frequently used forms were Item 8e, "California Standardized Test" (*M* = 1.87), and Item 8g, "parent conferences" (*M* = 2.07; see Table 4).

Table 4

Descriptive Statistics for Frequency of Usage of Various Forms of Data Sorted by Highest Mean Rating

Form of Data	*M*	*SD*	Low	High
8b. Class work	5.63	0.61	4.00	6.00
8a. Classroom assessments	4.47	0.97	3.00	6.00
8f. Student self-assessment	3.67	1.18	1.00	6.00
8d. District assessments	2.50	0.78	1.00	3.00
8c. Portfolios	2.33	1.37	1.00	6.00
8g. Parent conferences	2.07	0.64	1.00	4.00
8e. California Standardized Test	1.87	0.57	1.00	3.00

Note. *N* = 30. Ratings were based on a 6-point scale: 1 = *Never* to 6 = *Almost every day*.

Research Question 3

Research Question 3 asked, "What methods do teachers use, if any, to modify their instruction based on student data?" Table 5 displays the frequency counts for methods used to modify instruction based on the highest reported frequency. The most common instructional modifications were Item 9d, "individual conference with student" (63.3%) and Item 9g, "re-teach topic to the whole class" (56.7%). Only one respondent (3.3%) reported that he/she was unable to modify the instruction because his/her administration did not want him/her to fall behind in covering all of the lessons for the year (Item 9a). Two respondents

(6.7%) reported that they were unable to modify the instruction because they did not have the time (Item 9b).

Table 5

Frequency Counts for Methods of Modifying Instruction Based on Highest Frequency

Method	*n*	%
9d. Individual conference with student	19	63.3
9g. Re-teach topic to the whole class	17	56.7
9h. Peer tutoring	12	40.0
9f. Small group instruction	12	40.0
9c. Retest	12	40.0
9j. After school tutoring	10	33.3
9k. Web based review games	8	26.7
9e. Individual conference with student and parent	6	20.0
9i. Lunch/nutrition time tutoring	6	20.0
9b. I am unable to modify the instruction because I do not have the time.	2	6.7
9a. I am unable to modify the instruction because my administration does not want us to fall behind in covering all of these lessons for the year.	1	3.3

Note. $N = 30$. Respondents could endorse multiple methods so percentages add up to more than 100%.

Research Question 4

Research Question 4 asked, "Are teacher instructional practices, as it pertains to data-driven instruction, related to how long they have been teaching and the number of students they meet each week?" Table 6 displays the results of the Spearman rank-ordered correlations comparing the teachers' years of experience and number of weekly students with 22 selected variables. The variables were based on reteach strategies and types of data used to modify instruction. Spearman correlations

were used instead of the more common Pearson correlations due to the size of the sample (N = 30) (Huck, 2000).

For the 22 correlations between teacher experience and selected variables, four were statistically significant at the $p < .10$ level. Specifically, teachers with more experience were: (a) less likely to feel that using data was essential to improving student academic success (r_s = -.33, $p < .10$), (b) less likely to use the CST (r_s = -.40, p <.05), (c) less likely to have parent conferences (r_s = -.48, p <.005), and (d) less likely to have afterschool tutoring (r_s = -.31, $p < .10$; see Table 6).

Table 6

Spearman Rank-Ordered Correlations for Selected Variables with Teacher Experience and Number of Weekly Students

Variable	Experience	Number of Students
4. Percentage of students estimated to have shown acceptable levels of growth on the CST since last year.	.23	.14
5. Seen useful amounts of improvement in student academic achievement by utilizing data	.13	-.02
6. Feel using data is essential to improving student academic success	-.33	.06
7. Percentage of colleagues estimated to regularly use data to modify their instructional practices.	.11	-.16
8a. Classroom assessments [a]	-.08	.37**
8b. Class work [a]	.16	-.04
8c. Portfolios [a]	-.29	-.32*
8d. District assessments [a]	-.29	
8e. California Standardized Test [a]	-.40**	-.23

(Continued)

Variable	Experience	Number of Students
		(continued)
8f. Student self-assessment [a]	-.23	-.09
8g. Parent conferences [a]	-.48***	-.04
9a. Unable to modify instruction because of administration [b]	-.27	-.08
9b. Unable to modify instruction due to lack of time. [b]	.22	.03
9c. Retest [b]	-.20	.02
9d. Individual conference with student [b]	-.19	.13
9e. Conference with student and parent [b]	.00	.22
9f. Small group instruction [b]	-.17	-.35*
9g. Re-teach topic to the whole class [b]	-.18	.24
9h. Peer tutoring [b]	-.06	.05
9i. Lunch/nutrition time tutoring [b]	-.12	-.07
9j. After school tutoring [b]	-.31*	-.06
9k. Web based review games [b]	-.24	-.35*

Note. N = 30
* $p < .10$. ** $p < .05$. *** $p < .01$
[a] Ratings: 1 = *Never* to 6 = *Almost every day*
[b] Coding: 0 = *No* 1 = *Yes*

Table 6 also shows the 22 correlations between the number of students taught each week, teacher experience, and the 22 selected variables. Four correlations were statistically significant at the $p < .10$ level. Specifically, teachers with more students each week were: (a) more likely to rely on classroom assessments (r_s = .37, p <.05), (b) less likely to use portfolios (r_s = -.32, $p < .10$), (c) less likely to use small group instruction (r_s = -.35, $p < .10$), and (d) less likely to use web-based review games (r_s = -.35, $p < .10$). Also, veteran teachers were more likely to rely on classwork to modify their instruction and less likely to use the CST, parent conference, and after school tutoring as a way to modify their instruction.

Research Question 5

Research Question 5 asked, "Are teacher instructional practices, as it pertains to data-driven instruction, related to the teacher's primary subject?" To answer this question, a series of 22 one-way ANOVA tests was performed regarding the teachers' primary subjects with 22 selected variables. A one-way ANOVA is a way to test the equality of three or more means at one time by using variances. Table 7 displays the findings of the three resulting tests where the overall *F* test was significant at the $p < .10$ level and at least one of the Scheffe post hoc tests was significant at the $p < .10$ level. The Scheffe post hoc test is used when comparing differences between more than two groups and decreases the chance of reaching the wrong conclusion.

Table 7

One-Way ANOVA Tests for Selected Variables Based on Subject Taught

Variable	Subject Taught	*n*	*M*	*SD*	η	*F*	*p*
8d. Use district assessments[a]					.51	3.03	.05
	1. Math	7	2.57	0.79			
	2. English	10	2.60	0.70			
	3. Combination	6	3.00	0.00			
	4. Other	7	1.86	0.90			
8e. Use California Standardized Test[b]					.54	3.50	.03
	1. Math	7	2.29	0.49			
	2. English	10	1.80	0.42			
	3. Combination	6	2.00	0.63			
	4. Other	7	1.43	0.53			

(continued)

Variable	Subject Taught	*n*	*M*	*SD*	η	*F*	*p*
9k. Modify via web based review games[c]					.48	2.58	.08
	1. Math	7	0.14	0.38			
	2. English	10	0.10	0.32			
	3. Combination	6	0.67	0.52			
	4. Other	7	0.29	0.49			

Note. N = 30

[a] Scheffe tests: 3 > 4 (p = .06); no other tests were significant.

[b] Scheffe tests: 1 > 4 (p = .04); no other tests were significant.

[c] Scheffe tests: 3 > 2 (p = .10); no other tests were significant.

The use of district assessments was significantly different based on the teacher's primary subject area (p = .05). Scheffe post hoc tests found that teachers in "combination subjects" used district assessments significantly more often than did teachers in "other subjects" (p = .06). The use of the CST was significantly different based on the teacher's primary subject area (p = .03). Scheffe post hoc tests found that math teachers used the CST results more often than teachers in "other subjects" (p = .04). Modifications via web-based review games were significantly different based on the teacher's primary subject area (p = .08). Scheffe post hoc tests found teachers in "combination subjects" used these tools more often than did the English teachers (p = .10).

This study investigated whether data-driven instruction affected or informed strategies that middle school teachers used in their planning, teaching strategies, and assessments, and explored whether teachers used these data in order to make changes in their classroom and instruction. Data analysis yielded three key findings. Although veteran teachers found

data-driven instruction important, they did not feel it was essential to student academic success. The type of data used by teachers depended on class size, and English and combination teachers were more likely to use small group and web-based review games as tools to modify their instruction.

In the final chapter, these findings will be compared to the literature, conclusions and implications will be drawn, and a series of recommendations will be made.

Chapter Five: Discussion of Findings, Conclusions, and Recommendations

Purpose of the Study

The purpose of this quantitative survey study was to investigate middle school teacher perceptions regarding (a) the value of using data-driven instruction to improve student performance, (b) the frequency with which teachers used various types of data when using data-driven instruction, and (c) what methods teachers used to modify instruction based on student data. A second purpose of the study was to explore how, if at all, teachers' instructional practices were related to teacher years of experience, number of students taught each week, and teachers' primary subject areas?

Research Questions

In order to develop a better understanding of middle school level teachers' utilization of data-driven instruction as a tool to improve student learning, the following research questions were explored with teachers at a middle school in Southern California:

1. Do teachers perceive data-driven instruction to be helpful in improving student performance?
2. When using data-driven instruction, how frequently do teachers use various types of data?

3. What methods do teachers use, if any, to modify their instruction based on student data?
4. Are teacher instructional practices, as it pertains to data-driven instruction, related to how long they have been teaching and the number of students they teach each week?
5. Are teacher instructional practices, as it pertains to data-driven instruction, related to the teacher's primary subject?

Methodology

This study examined the perspectives of 30 middle school teachers in a Southern California middle school. The teachers were asked to respond to an online survey that asked nine questions about their data usage, how they implemented data into their classroom, and whether they found data necessary in order to improve their instruction.

Discussion of Findings

Now more than ever, schools and school districts are being held accountable for student academic success and not just delivery of instruction (Oberman et al., 2005). As a result of NCLB, schools and school districts are now required to scrutinize their students' performance through data use (California Department of Education, 2003).

Data analysis yielded many findings about the use of data in middle school instruction at a particular school in Southern California. The following sections discuss key findings and implications organized by research question.

Research question 1: Do teachers perceive data-driven instruction to be helpful in improving student performance? The majority of teachers who participated in this study (83.3%) responded that data is essential to improving student academic success. On a scale of 1–5, 5 being the highest score, the teachers endorsed an average score of 3.7 on a question indicating whether data was necessary to guide their instruction. This key finding is aligned with the research literature that indicates that teachers are increasingly seeing the value of data-driven instruction as a way to change or improve instruction (Courneene, 2008; Datnow et al., 2007; Ikemoto & Marsh, 2007; Leahy et al., 2005). Data provide teachers with day-to-day feedback that is necessary for effective instructional decision-making. In a culture where data has become a huge part of education, a successful school is one where teachers are revisiting and renewing their instruction methods consistently and always looking for evidence and feedback about how well their students are doing (Earl & Katz, 2006; Ingram et al., 2004).

Research question 2: When using data-driven instruction, how frequently do teachers use various types of data? Teachers who participated in this study used a variety of data, such as classroom assessments, classwork, portfolios, district assessments, state assessments, student self-assessments, and parent conferences. However, the type of data used depended on class size and teacher experience.

Teachers with bigger class sizes tended to use classroom assessments such as quizzes and tests more often, as opposed to portfolios. This finding could be accounted for by the large class size preventing the teacher from having enough time to meet with each student individually in order to create portfolios. This finding could also be due to familiarity of quizzes and tests and the unlimited nature of and ease of access to classroom assessments. Furthermore, this finding could represent a fear of using other types of data. Ingram et al. (2004) stated that many teachers have an inherent mistrust of data because they feel the results could be skewed based on absences or whether or not the data reflect the standards being taught.

Teachers with smaller class sizes used portfolios along with many other forms of data as assessment tools to modify their instruction more often than teachers with larger class sizes. Also, teachers with more experience were less likely to

use parent conferences as a tool to modify their instructional practices. The study showed that more experienced teachers were less likely to meet with parents as a tool for data use to modify their instruction, but instead used other sources of data.

According to Bernhardt (2004), it is important to use multiple measures of data to understand the students' learning and to provide the information necessary for continuous improvement in instruction. The research implies that, given the opportunity, teachers will use a variety of data, but years of experience and the number of students taught affect which data is being used (Bernhardt, 2004; Creighton, 2007; Earl & Katz, 2006; Johnson, 2002). With this said, it seems that the variety of data available to middle level teachers gave a more complete picture of student needs, which in turn informed their instructional practices, as well as reinforcing their efforts and encouraging them to continue to engage in data-driven practices.

Research question 3: What methods do teachers use, if any, to modify their instruction based on student data? As identified in Table 6, the most common way to modify instruction was by retesting. Teachers used student test results to adjust daily lessons, reteach concepts if time permitted, and review student work. However, only one teacher stated that he/she was unable to

modify his/her instruction because he/she did not have enough time. Another teacher felt that he/she was unable to modify his/her instruction because the administration did not want him/her to fall behind in covering all of the lessons for the year.

Furthermore, the more years a teacher taught, the less likely he/she was to use nutrition/lunch time for tutoring or stay after school to tutor. Teachers with fewer students were more likely to use web-based review games, individual student conferences, and small group instruction. Results of this study showed that the teachers surveyed—such as English teachers, math teachers, combination teachers, and veteran teachers—used different methods to modify their instruction based on student data.

The results also showed that, depending on class size, the more students a teacher had, the less likely he/she was to use web-based review games or small group instruction as a way to modify instruction. This finding implies that teachers with large classes preferred retesting because the results were quicker and easier to implement. Based on the literature, a variety of accessible data and methods to analyze data suggest that teachers have the opportunity to use data effectively for student learning and are able to modify their instruction if they have access to useful short-term data (Datnow et al., 2007;

Garrison & Eringhaus, 2007; Schmoker, 1999). The research shows that the teachers at this school need to be given more time to modify instruction, given professional developments on how to implement different instructional practices based on class size, and given more administrative support.

Research question 4: Are teacher instructional practices, as it pertains to data-driven instruction, related to how long they have been teaching and the number of students they meet each week? Veteran teachers used various types of data, such as classroom assessments, classwork, portfolios, observations, etc., but did not find this process essential to academic success. In a study done in the American Journal of Education, Young (2006) found that veteran teachers felt they knew best when it came to what their students needed academically and did not need testing to guide their instruction. The only assessment the veteran teachers felt was effective was a fluency test given to gauge a student's comprehension level. Otherwise, they would use their judgment based on what they heard and observed while the students read.

In contrast, the numbers of years taught did not have much of an effect on what type of modification teachers used to guide their instruction, except for lunchtime tutoring. Based on the findings, 77% of the veteran teachers were less likely to tutor during lunchtime than newer teachers. However, this finding does

not mean that all veteran teachers abstained from participating in lunchtime/nutrition tutoring.

The results of the study show that the longer a teacher had been teaching, the less likely he/she felt that using data was essential to improving student academic success. However, this finding does not mean that veteran teachers do not utilize or analyze their data; rather, it implies that they do not believe certain data is the only way to assess how a student is performing academically. According to the NCTAF (2007), by utilizing various assessments that measure students' strengths and weaknesses, teachers can teach and guide their instruction more purposefully and continually so that students can develop a better understanding of the material and demonstrate what they have learned. It also states that in order for students to be successful in school, educators must be willing to leave behind their old ways of teaching and embrace the changes that are occurring both demographically and technologically (Johnson, 2002).

It may seem from this study's findings that all teachers, whether new or veteran, were willing to embrace changes; however, they had diverse opinions about the best way of gathering data, which data could be most useful, and which data would help guide their instruction most effectively. Nevertheless, the study showed that many veteran teachers did

not feel that parent conferences were a useful tool to generate data.

Research question 5: Are teacher instructional practices, as it pertains to data-driven instruction, related to the teacher's primary subject? This study generated many interesting findings related to data use and instructional modifications related to primary subject taught. The subject areas were divided into math, English, combination classes, and other (this could include Art, Physical Education, History, Science, Special Education, and any other non-core classes). Combination classes were any classes where the teacher taught more than one subject to a set of students.

Teachers of all academic subjects felt that data use is essential to improving student academic success. Interestingly, teachers that taught non-core academic classes, on a scale of 1-5 with 5 being the highest, scored a 4.42 for the question, "Do you feel that using data is essential to improving student academic success?", which was a higher score than that given by teachers of all other subjects. This finding implies that non-core academic classes also use some form of data to assess their students, which indicates that data use is important in order for students to have success in all academic subjects. This study also showed that peer tutoring and small group instruction occurred most often in combination and English classes. Because

combination teachers keep their students for at least two class periods, this could explain why they had time to implement these modifications. English teachers were also able to implement small group instruction and peer tutoring, which might be due to smaller class sizes or grouping students into literature groups.

A low percentage of the teachers (30%) used district assessments or the CST in order to inform their instructional practices. According to Bernhardt (2004), many schools and districts believe that data from state assessments are neither sufficient nor timely enough to make informed school decisions and guide instruction.

These findings imply that data-driven instruction is not only useful to core classes such as math and English, but also to non-core classes, such as physical education and art. It can also be implied that even though teachers find data-driven instruction useful, they do not necessarily feel that all data is useful when modifying instruction such as district assessments or the CST.

Teaching to the Test

Unfortunately, research has found that student data can be used in adverse ways. One negative use of data is teachers teaching to the test to get the results that they want (Marsh et al., 2006). Teachers that want their students' scores to be good might look at assessments to see what their students will be

tested on and teach those specific questions, not the standards they evaluate, to the students so that they will earn high scores. This can be harmful because the students will seem to be successful, but in fact they will only be scoring well on the test because they memorized how to solve those specific questions. Such students may still require additional instruction because they do not understand the standards on which the questions are based.

Moreover, many schools have now begun to focus their instruction only on math and English, neglecting other subjects, such as science and history, so that students will score well on state standardized tests. Many teachers are told to modify their instruction only for students that are *borderline*: students who, if given extra practice, might score proficient or advanced, which will bolster the school's API scores (Marsh et al., 2006). The teachers at this Southern California school did not seem to feel that they had to teach to the test, but rather understood that they needed to modify their instruction for all students by analyzing data.

Conclusions

Five conclusions emerged from an analysis of the key findings from this study.

Student success with data-driven instruction. Teachers in this study found data-driven instruction useful in improving

student achievement. The study showed that 83.3% of the teachers surveyed felt that data-driven instruction is essential to improving student academic success. Data can be essential because it can provide teachers feedback that is necessary for effective instructional decision-making and allow teachers to revisit and renew their instruction based on student achievement (Johnson, 2002; Marsh et. al., 2006; Messelt, 2004).

Variety of data. Teachers in this study had access to a variety of data. The survey showed that teachers used data such as classroom assessments, classwork, portfolios, etc., based on class size and numbers of years taught. The use of multiple measures of data is important in order for teachers to understand the students' learning and to provide information necessary for continuous improvement in instruction (Bernhardt, 2004; Marsh et. al., 2006; Mitchell et. al, 2000).

Using data to modify instruction. In this study, teachers used a variety of methods to modify their instruction, such as re-teaching, tutoring, web based review games, or small group instruction. However, experience and class size played a role in how the teachers modified their instruction. Teachers with bigger class sizes were less likely to use web-based review games or small group instruction and veteran teachers were less likely to use nutrition/lunch or after school time for tutoring. Using a variety of methods to modify instructions helps teachers

be effective in helping students achieve academically (Datnow et al., 2007; Leay et al., 2005; Schmoker, 1999).

Veterans and data. In this study, even though veteran teachers used data to increase academic achievement, they did not feel that it was essential. Veteran teachers might feel that they know what students need without using data because of their years of observing students. Veteran teachers may feel they can use their judgment instead of relying on testing for student assessment (Mason, 2002; Young, 2006).

Data success for all academic subjects. The results of this study also showed that teachers that teach non-core academic classes such as physical education and art also felt that data was useful to improving student academic success. Data-driven instruction is not limited to subjects such as math and English but can also benefit all subject areas in order to help students be successful academically (Bernhardt, 2004; Ingram et al., 2004; Messelt, 2004; Mitchell et. al, 2000).

Recommendations

The findings from the literature review suggest that the use of data can make a difference in school improvement efforts by helping teachers determine how best to improve student learning. It is important to understand the range of data available to them and the benefits and limitations of each data type. Building teacher knowledge about the kinds of available

data is an important first step to using data for instructional purposes. The types of data collected can determine what modifications a teacher will make (Bernhardt, 2004).

A small percentage of the teachers who participated in this study felt that they did not have enough time to modify their instructional practices. It can be implied that deadlines they were required to meet based on a mandatory pacing plan that dictated specific standards they needed to cover within a specific time frame might have prevented them from having enough time. According to Datnow et al. (2007), it is important to train teachers to analyze data and give them ample time to implement data-driven instruction. By doing this, teachers will understand how important data-driven instruction is to the school.

Teachers' fear or lack of knowledge can also be a hindrance to improved student academic success. Many teachers fear data because of their lack of knowledge on the topic, because they do not know how to use it, and because they fear what the data might say about their teaching when compared to other teachers (Mason, 2002). Teachers have to be willing to embrace data and trust the results instead of relying on their intuition to measure student progress and success. Generally, teachers at this Southern California School accepted the fact that using

data was necessary to improving instructional practices in the classroom.

Middle school teachers have begun to embrace the shift from intuition-based decision-making to data-based decision making with respect to analyzing data for instructional purposes. As this study revealed, middle school teachers tend to use data that they feel offer quick results and are useful, easy to analyze, accessible, and meaningful in order to identify and address the needs of students who are not achieving (Garrison & Ehringhaus, 2007). In order to be able to implement data correctly and modify their instruction accordingly, teachers must first have the necessary tools, such as technology, time, and the ability to collaborate.

Policy. This research and prior research grounded in the use of data may have the following implications for the use of data-driven instruction that the school under investigation should implement.

- By utilizing data, schools and teachers can modify their instruction using a variety of strategies. For example, future research could identify reteach methods that teachers prefer (Shorr, 2003).
- Schools in the district should have common data that they use in order to guide their instruction. All teachers should be willing to implement and analyze the various

data in order to inform their instruction. Class size, years of teaching, and subject taught should be factors included when considering what data to use (Johnson, 2002).

- Providing teachers with time to analyze, reflect, collaborate with other teachers, and attend professional developments is essential in order for data-driven instruction to be effective (Datnow et al., 2007; Walsh Symons, 2003; Yao, 2009).
- Having technology available and training schools and teachers to use technology to collect and analyze their data is key to having success with data-driven instruction (Streifer, 2002).

Practice. A small percentage of the teachers (7%) who participated in this study felt that they did not have enough time to modify their instructional practices. According to Datnow et al. (2007), it is important to train teachers to analyze data and give them ample time to implement data-driven instruction. By doing this, teachers will understand how important data-driven instruction is to the school. Also, based on the research, veteran teachers used data but did not find it essential to guiding their instruction.

This research and prior research grounded in the use of data may have the following implications for the use of data-

driven instruction that the school under investigation should implement.

- At the middle school under investigation, a few teachers mentioned that they did not feel they had the ability to modify their instruction because they did not have enough time or the administrator did not want them to fall behind. Future research may benefit from interviewing administrators to see how they support teachers in data-driven instruction and if they share the same perceptions as teachers.
- All teachers in this study felt that data-driven instruction was important, but veteran teachers did not feel that it was essential to student academic success. Further researchers could specifically interview veteran teachers to understand what elements they felt were essential to student academic success and investigate the quality of data veteran teachers use to inform their instruction.
- Provide time for teachers to analyze data and modify instruction (Datnow et al., 2007; Walsh Symons, 2003; Yao, 2009).
- Provide time for teachers to communicate and collaborate with each other about their findings (Bernhardt, 2004).

- Provide professional development for both veteran and novice teachers based on their experience level (Datnow et al., 2007; Walsh Symons, 2003; Yao, 2009).
- Provide professional development for methods of reteaching specific to subjects taught (Datnow et al., 2007; Walsh Symons, 2003; Yao, 2009).

Future study. Although this study showed the data use and instructional practices of teachers at one middle school, additional research in data use and instructional practices is necessary because of this study's low numbers of participants and lingering unanswered questions. The researcher presents the following suggestions for future research regarding data-driven instruction.

- In the future, exploring multiple schools' use of data-driven instruction might increase the scope of the research. It would also be beneficial to add various methods of collecting data such as observations, interviews, and surveys.
- Closing the achievement gap has been an ongoing effort among all U.S. schools. Future studies could observe how schools are using data to close the achievement gap and what data are being used to do so.

- Professional development is an important aspect of data-driven instruction. Future research may investigate types of professional developments for veteran teachers versus new teachers.

These and other follow-up studies could provide more information about data-driven instruction and how it can help teachers to promote student academic success.

Summary

In the United States, academic achievement levels of middle school students fall behind those of other developed countries (Balfanz et al, 2002). Less than 30% of eighth grade students scored proficient in science in 2012 (NCES, 2012) and only 36% of eighth grade students scored proficient in math and reading in 2012(NCES, 2013). The academic success of middle school students has become such an important focal point that legislation known as the Success in the Middle Act was first introduced in 2007, again in 2009, and again in 2013 by Rep. Raul Grijalva and Sen. Sheldon Whitehouse (Hawaii 24/7, 2011).

The findings from this study suggest that the use of data-driven instruction can make a difference in middle school improvement efforts. Teachers must be willing to analyze data, collaborate with one another, and reflect on their teaching in order to improve student achievement (Courneene, 2008; Datnow et. al, 2007). It is also important for teachers to understand

the data available to them and the benefits and limitations of each data type. Building teacher knowledge about the kinds of available data is an important first step in using data for instructional purposes (Bernhardt, 2004).A successful school is one where teachers are consistently revisiting and renewing their instructional methods and always looking for evidence and feedback about how well their students are doing academically (Earl & Katz, 2006; Johnson, 2002).

From the time that ESEA was implemented and until recently with NCLB, data-driven instruction has become a necessity in districts/schools across the United States (California Department of Education, 2003). Middle school teachers across the nation are seeing the importance of data-driven instruction. Through their time, effort, and hard work, these schools are showing that data can be used as a way to guide their instructional practices and help students to be successful academically in middle school.

Based on the findings of this study, it is possible that data-driven instruction can be an integral part of creating success at the middle school level and closing the achievement gap.

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APPENDIX A

IRB Exemption Letter

PEPPERDINE UNIVERSITY

Graduate & Professional Schools Institutional Review Board

February 21, 2013

Scheherazade Dedman

Protocol #: E0212D08
Project Title: The Extent of the Use of Data-Driven Instruction Techniques in Middle School Instruction

Dear Ms. Dedman,

Thank you for submitting the revisions requested by Pepperdine University's Graduate and Professional Schools IRB (GPS IRB) for your study, *The Extent of the Use of Data-Driven Instruction Techniques in Middle School Instruction*. The IRB has reviewed your revisions and found them acceptable. You may proceed with your study. The IRB has determined that the above entitled project meets the requirements for exemption under the federal regulations 45 CFR 46 - http://www.nihtraining.com/ohsrsite/guidelines/45cfr46.html that govern the protections of human subjects. Specifically, section 45 CFR 46.101(b)(2) states:

> (b) Unless otherwise required by Department or Agency heads, research activities in which the only involvement of human subjects will be in one or more of the following categories are exempt from this policy:
>
> **Category (2) of 45 CFR 46.101.** research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: a) Information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and b) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

Your research must be conducted according to the proposal that was submitted to the IRB. If changes to the approved protocol occur, a revised protocol must be reviewed and approved by the IRB before implementation. For any proposed changes in your research protocol, please submit a **Request for Modification Form** to the GPS IRB. Because your study falls under exemption, there is no requirement for continuing IRB review of your project. Please be aware that changes to your protocol may prevent the research from qualifying for exemption from 45 CFR 46.101 and require submission of a new IRB application or other materials to the GPS IRB.

A goal of the IRB is to prevent negative occurrences during any research study. However, despite our best intent, unforeseen circumstances or events may arise during the research. If an unexpected situation or adverse event happens during your investigation, please notify the GPS IRB as soon as possible. We will ask for a complete explanation of the event and your response. Other actions also may be required depending on the nature of the event. Details regarding the timeframe in which adverse events must be reported to the GPS IRB and the appropriate form to be used to report this information can be found in the *Pepperdine University Protection of Human Participants in Research: Policies and Procedures Manual* (see link to "policy material" at http://www.pepperdine.edu/irb/graduate/).

Please refer to the protocol number denoted above in all further communication or correspondence related to this approval. Should you have additional questions, please contact me. On behalf of the GPS IRB, I wish you success in this scholarly pursuit.

6100 Center Drive, Los Angeles, California 90045 ▪ 310-568-5600

Sincerely,

Doug Leigh, Ph.D.
Chair, Graduate and Professional Schools IRB
Pepperdine University
Graduate School of Education & Psychology
6100 Center Dr. 5th Floor
Los Angeles, CA 90045
Doug.Leigh@pepperdine.edu
W: 310-568-2389
F: 310-568-5755

cc: Dr. Lee Kats, Vice Provost for Research and Strategic Initiatives
Ms. Alexandra Roosa, Director Research and Sponsored Programs
Dr. Robert Barner, Graduate School of Education and Psychology

APPENDIX B

Request to School Principal to Conduct Study

October 10, 2012

Dear Mr. Boone,

My name is Scheherazade (Scherry) Dedman, a doctoral candidate at Pepperdine University. In the near future I will contact you to have teachers from your school participate in a research study. My research is entitled: The Extent of the Use of Data-Driven Instruction Techniques in Middle School Instruction. I will be working under the supervision of my chair, Dr. Robert Barner, who can be contacted at (xxx) xxx - xxxx, if you should have any questions. You may also contact Dr. Leigh, IRB chair, at (xxx) xxx - xxxx. This study is being conducted to identify factors that contribute to the success of middle school students' academic achievement.

My research will examine how teachers implement data-driven instruction in their classroom and whether they feel it is effective. The findings will have practical implications as they can serve to help educators better identify ways to improve middle school students' academic achievement school wide with the use of data-driven instruction.

In late October, I would like to be able to meet with your teachers in person to gain consent and discuss with them the survey that I would like for them to complete online. The survey will take approximately 10 – 15 minutes. The survey does not ask for any identifying information and all information will be kept strictly confidential, and is of minimal risk to the staff members. Once teachers have completed the survey, the surveys will be kept confidential in a locked file cabinet for five years, at which time they will be shredded.

Your permission to conduct this study is important and will be greatly appreciated. Reporting results of my research will be given to you and Lompoc Unified School District in a generalized format and therefore, the school district or school will not be named, nor would the identity of participants. Thank you in advance for your time and assistance in this research. If you wish to review a copy of the dissertation before it is submitted for approval, I will be willing to provide you with the opportunity. If you have any questions, please feel free to contact me at [redacted] or [redacted]

Sincerely,

Scheherazade Dedman
Pepperdine University
ELAP Program Doctoral Candidate

APPENDIX C

Permission to Conduct Study Letter

CREDIT REPORT

Inbox
Conversations
Drafts 1
Sent
Spam 193
Trash 1
Folders
Online Contacts

RE: survey Hide Details

FROM:

Tuesday, October 30, 2012 2:20 PM

TO: scherrbear

Hi Scherry,
You have my permission to administer the survey to my staff on a voluntary basis
Middle School. Our district office supports this as well. Please let me know if you have any questions or concerns.
Thanks,

Principal
Middle School

APPENDIX D

Survey Items

1. How long have you been teaching in middle school ? _____ year(s)

2. In a typical week how many different students do you have in your class? _____ students

3. What is the primary subject that you teach:
a) Math b) English c) Science d) PE e) Art f) Music g)Social Studies

4. What percentage of your students do you estimate to have shown acceptable levels of growth on the CST since last year? _____ %

5. Have you seen reasonable levels of improvement in student academic achievement by utilizing data?
Definitely no Mostly no Sometimes yes or no Mostly yes Definitely yes

6. Do you feel that using data is essential to improving student academic success?
Definitely no Mostly no Sometimes yes or no Mostly yes Definitely yes

7. What percentage of your colleagues do you estimate to regularly use data to modify their instructional practices? _____ %

8. How often do you use the following types of data to modify your instructional practice?

a. Classroom assessments
Never 1-2 times a year 1-2 times a month Once a week 2-3 times a week
Almost Everyday

b. Class work
Never 1-2 times a year 1-2 times a month Once a week 2-3 times a week
Almost Everyday

c. Portfolios
Never 1-2 times a year 1-2 times a month Once a week 2-3 times a week
Almost Everyday

d. District assessments
Never 1-2 times a year 1-2 times a month Once a week 2-3 times a week
Almost Everyday

e. California Standardized Test

Never 1-2 times a year 1-2 times a month Once a week 2-3 times a week Almost Everyday

f. Student self assessment

Never 1-2 times a year 1-2 times a month Once a week 2-3 times a week Almost Everyday

g. Parent conferences

Never 1-2 times a year 1-2 times a month Once a week 2-3 times a week Almost Everyday

9. There are many different ways a teacher can modify instruction to facilitate additional learning based on student performance data. Below is a list of commonly used methods. Please put a check mark next to the one(s) that you typically use at least weekly.

___ a. I am unable to modify the instruction because my administration does not want us to fall behind in covering all of these lessons for the year.

___b. I am unable to modify the instruction because I do not have the time.

___ c. Retest

___ d. Individual conference with student

___ e. Individual conference with student and parent

___ f. Small group instruction

___ g. Re-teach topic to the whole class

___ h. Peer tutoring

___ i. Lunch/nutrition time tutoring

___ j. After school tutoring

___ k.Web based review games

___ l. Other method(s). Please specify _____

APPENDIX E

Permission to use graphs for Figures 1, 2, and 3

Sent:Monday, February 24, 2014 1:01 PM
To: Dedman, Scherry (student)
The report is in the public domain. You do not need written permission.

-----Original Message-----
From: Dedman, Scherry (student) [mailto:[redacted]]
Sent: Monday, February 24, 2014 3:57 PM
To: Sikali, Emmanuel
Subject: RE: copy right permission

Thank you! I do however need written permission from you stating that I can use the graphs in order to pass IRB. You can send it through email and I can cut and paste it. I hope this does not inconvenience you.

Scherry Dedman

_____
From: Sikali, Emmanuel [Emmanuel.Sikali@ed.gov]
Sent: Friday, February 21, 2014 11:44 AM
To: Dedman, Scherry (student)
Subject: RE: copy right permission

Please look at the last page of the report, there is a suggested citation right above content contact. Good luck!

-----Original Message-----
From: Dedman, Scherry (student) [mailto:[redacted]]
Sent: Thursday, February 20, 2014 9:51 PM
To: Sikali, Emmanuel
Subject: copy right permission

Hello,
I am writing in regards to being able use a few of the graphs you created to show the 8th grade achievement in math, science, and reading level on the National Center for Educational Statistics website: (http://nces.ed.gov/nationsreportcard/pdf/main2011/2012465.pdf) and (http://nces.ed.gov/nationsreportcard/subject/publications/main2013/pdf/2014451.pdf) for my dissertation. My dissertation is about data driven instruction at the middle school level and I need the graphs to visually show how 8th grade students are performing and why data is necessary. I need written permission to be able to use them in my dissertation. Please let me know if it is possible.

Thank you,

Scheherazade Dedman
Pepperdine University
Doctoral Candidate