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Perceptions of Teachers about Using and Analyzing Data to Inform Instruction

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Walden University
2018

Abstract

Perceptions of Teachers about Using and Analyzing Data to

Inform Instruction

by

Lateasha M. Harris

EdS, Walden University, 2014

MA, University of Phoenix, 2008

BS, Morris College, 2003

Project Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Walden University

June 2018

Abstract

Monitoring academic progress to guide instructional practices is an important role of teachers in a small rural school district in the Southern United States. Teachers in this region were experiencing difficulties using the approved school district model to implement data-driven instruction. The purpose of this qualitative case study was to identify elementary- and middle-level teachers' perceptions about using the Plan, Do, Study, Act (PDSA) model to analyze data in the classroom and use it to inform classroom instruction. Bambrick-Santoyo's principles for effective data-driven instruction was the conceptual framework that guided this study. The research questions were focused on teachers' perceptions of and experiences with the PDSA. A purposeful sampling was used to recruit 8 teachers from Grades 3-9 and their insights were captured through semistructured interviews, reflective journals, and document analyses of data walls. Emergent themes were identified through an open coding process, and trustworthiness was secured through triangulation and member checking. The themes were about using data to assess students, creating lessons, and collaborating with colleagues. The three findings revealed that elementary- and middle-level teachers acknowledge PDSA as an effective tool for guiding student learning, that teachers rely on assessment data, and that teachers need on-going collaborative engagement with their colleagues when using the PDSA. This study has implications for positive social change by providing a structure for improving classroom instructional practices and engaging teachers in more collaborative practices.

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Dedication

I dedicate this doctoral study to my husband Richard Harris, who has been supportive throughout this entire process. Thank you for keeping the family grounded throughout the tough times and being patient with me as I continued to push through this tough journey. By far this is the most challenging task I have ever encountered. I could not have done it without your support. I also dedicate this to my four children Jason, Ravon, Divine, and Layla. I want you all to know that anything is possible when you put God first, work hard, and take one step at a time to complete your goals. As I worked on this many, many late nights, I wanted to give up, but watching you all sleep as I worked gave me the motivation to persevere.

I would also like to dedicate this to my parents, Annie Mae and Cliff. Thank you for buying me that chalkboard that I really wanted for Christmas when I was a kid, it paved the way for my destiny. Cliff, although you are not here to witness this, I want you to know that you have inspired my love for teaching. Lastly, this is dedicated to my 18-year-old nephew, Johnte', who was killed while I was trying to complete this journey. I love you all!

Acknowledgments

I would like to extend special thanks to my Chair, Dr. Lafferty, who challenged me and helped me all along the way. I have learned so much with your guidance. I appreciate your tough love and honesty about my work. It has truly made me grow as a scholar. I will forever be thankful for your hard work and commitment. I would like to extend my gratitude to my second committee member, Dr. Myers. I thank you for dedicating your time and providing prompt, timely feedback to improve my writing further. Your perspective forced me to be more reflective as I moved forward. You are very knowledgeable, and you have truly enhanced this learning experience. To my URR, Dr. Ellis, none of this would be possible without a great team. You are a perfect fit and asset to this team. It is with great humility that I acknowledge and share my appreciation for this team's collective knowledge during this process. Thank you all for your dedication and sharing your expertise with me. I plan to pay it forward as I excel in my career in education.

Thank you, Ma-Adria, for always making me feel special and encouraging me to want more. Lastly, I want to thank my husband for being so patient with me throughout this whole process. I know it has been very hard at times, but I thank you for cooking, cleaning, and being available when I needed you most.

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Section 1: The Problem

The Local Problem

A small rural school district located in the Southern United States has prescribed a model for teachers to use to facilitate data-driven instruction. The goal of implementing the model was to monitor academic progress to increase student achievement. However, not all teachers at the schools where I conducted the project study monitored academic progress effectively by using this model. Teachers have shared concerns with me throughout the past year, which I include in the problem and rationale of this study. The Plan, Do, Study, Act (PDSA) is a process of data-driven instruction to offer a continuous classroom improvement strategy mandated by district personnel for all teachers. PDSA is a model that requires teachers to continuously and consistently evaluate and improve teaching and learning (Jim Shipley & Associates, 2012). According to one school administrator, teachers partially implement this model at the local schools, and there seems to be a breakdown somewhere in the model, which revealed the difficulty in using data to inform instruction. Some of the teachers, such as H. Bennette, reported different methods for using this model to analyze data, and some did not know how to start this process. Similarly, Coburn and Turner (2012) identified that there is little known about how people in schools are interacting with the data—interpreting the data, responding to the data, or even ignoring the data.

The state department of education identified a school within this local district as at-risk; as a result, the district administrators started to bring a focus more on best practices. One best practice implemented was using data to inform instruction and

improvement. Because of the district administrators' efforts to address the state's at-risk determination, all schools in the local district were required to use PDSA, a uniform continuous improvement strategy to maintain high student achievement once the at-risk school no longer under the jurisdiction of the state department of education. The PDSA provides a model for teachers to construct data walls in classrooms. Classroom data walls provide a snapshot of each student's performance as both an individual and as a member of a group. Data walls are a way to make data public and build a culture of healthy competition in the classroom. In addition, data walls help build accountability for teachers because the classroom becomes transparent to visitors. The data wall shows if students were mastering the academic standards (Boston Plan for Excellence, 2011). The data walls in this district's schools were constructed and posted on a classroom bulletin board with printed information organized by the PDSA. The organizational components of the data walls include the learning requirements, class mission, learning goals, class learning results on assessments, and the teacher and student actions for improvement during each learning cycle within the PDSA. The prescribed model involves a cycle for analyzing and using student data to drive instruction. Teachers accomplish the steps of PDSA as they complete their lesson plans during each learning cycle, such as planning the lesson and conducting student activities. Leaders can monitor their lesson plans, but there are other parts, such as analyzing the results from assessments and adjusting instructional strategies, that the individual teacher monitors completely.

The first part of PDSA (Jim Shipley & Associates, 2012), the *plan* stage, is done with supervision. In this stage, teachers are required to unpack standards and identify

objectives also known as learning targets and determine how to measure student proficiency; this stage is always in the lesson plans. The *do* stage of the model is also in lesson plans, and teachers must post the list on data walls as well. In this stage, teachers identify high-yield instructional strategies that the teachers will use and activities related to the strategies that the students would do to learn. The *study* stage involves teachers checking the results of assessments to measure student progress toward learning objectives. The teachers and students determine what did not work and what did work. According to a school administrator, in this stage teachers must analyze classroom assessment data in addition to analyzing benchmark data. Administrators leave teacher analysis of classroom assessment data to chance at this stage because the teacher does the analysis independently. Teachers also complete the last stage of the model independently. Teachers are required to take the information from the analysis and develop an action plan for the next learning cycle to address the learning of students who have or have not mastered the objectives (Jim Shipley & Associates, 2012). The *act* stage allows teachers to plan what they will do differently next time. Teachers usually collect data and never follow through with structured schedules and times to analyze the data and discuss or follow-up with instructional improvement plans after the data have been analyzed (Bambrick-Santoyo, 2010; Schildkamp, Karbautzki, & Vanhoof, 2014). Once teachers analyze the data to reveal academic weaknesses and identify students who are struggling, they need to reflect on individual instructional processes that may address the identified weaknesses (Means, Padilla, & Gallagher, 2010).

Although most school districts support the practice of data-driven decision-making, some teachers struggle to make sense of the multiple data sources from different assessments (Means, Chen, DeBarger, & Padilla, 2011). Making sense of data involves going through a variety of commonly used data displays and understanding data from various periods, entities, or subgroups (U.S. Department of Education, 2008). According to Protheroe (2009), good data might be difficult to find and use effectively. School districts are now starting to address this process (Protheroe, 2009). Even though data are a necessity for the improvement of education, many teachers face barriers such as time to use data effectively in classrooms and to improve instruction. Many teachers also lack the skills necessary to analyze and interpret test scores and student work samples, even after facilitators have provided some school faculties with yearlong training (Kerr et al., 2006; Schildkamp et al., 2014). Datnow and Hubbard (2015) noted differences in how teachers believe data-informed instruction should look. There should be a standard, systematic process such as PDSA to support how teachers analyze data and use the data to develop a plan to improve instruction.

Definition of the Problem

There was a gap in practice between district administrators' expectations of teachers' implementation of data use and the competency levels of teachers to perform this task. Although the teachers in this local school district have attempted to use the PDSA, they did not routinely implement the model. Several studies have been completed in districts across the country in which the researchers revealed that teachers struggle with using data from assessments to inform instruction (Marsh & Farrell, 2015; Means et

al., 2011; Weiss, 2012). Although many teachers at this local setting could set up data walls, B. Goodwin, a teacher at the local school suggested that there was no time devoted for teachers to discuss ways to put that data to use in their individual classrooms. Teachers may need to collaborate with colleagues to analyze data, which may result in more use of the data to drive instruction as opposed to analyzing data alone (Weiss, 2012). Data-driven decision-making has become a required skill for educators to meet the demands of legislated policies and to address the needs of students. The No Child Left Behind Act of 2002 (NCLB), the American Recovery and Investment Act of 2009, the Race to the Top (2009) competition, and Every Student Succeeds Act (2015) are examples of legislation that increased teacher accountability to improve instruction and to use more assessments in the classrooms. These legislative policies all require educators to use tracked data to prepare educational plans, to meet state standards, and meet student growth requirements (U.S. Department of Education, 2004, 2009, 2015a). Race to the Top reforms were also focused on building data systems that can inform educators on how to improve instruction (U.S. Department of Education, 2016). In addition, the Every Student Succeeds Act of 2015 required that educators measure students' progress toward academic standards. Educators should use several indicators to measure student progress toward goals as opposed to one means of measurement (U.S. Department of Education, 2015b). Teachers could use federal government measures of student progress to provide timely data to inform instruction (Darling-Hammond et al., 2016).

Rationale

Elementary and middle school teachers in a rural school district in the Southern United States did not monitor student academic progress effectively using PDSA, a data-driven model required by the district. The purpose of this qualitative case study was to identify elementary- and middle-level teachers' perceptions about using the PDSA to analyze data in the classroom and using that data to inform classroom instruction. The goal of this project study was to identify how elementary and middle school teachers implement the PDSA to analyze data to improve student learning outcomes. Professional development opportunities to support elementary and middle school teachers about applying the PDSA to analyze data could improve teacher skills to guide student performance.

The primary focus of this study was to identify teachers' perceptions regarding how they use the PDSA to analyze data in Grades 3-9 classrooms to inform instruction. In 2009, the local school district's state report card revealed that student performance in academic content areas needed improvement. However, as shared by a lead administrator, R. Barnes, this was a school district that went through major changes to correct an at-risk status that was later transformed to a district in good standing. According to the state department of education report card, the school district rating was *at-risk* in 2007 and *below average* in 2008 and 2009. Student achievement improved in 2010, and the state report card revealed an absolute rating of *average*; in 2011, the district achieved a *good* rating. R. Barnes wanted to bring about improvements in the district so he implemented several initiatives, which included the PDSA, a model used for data-driven instruction.

Once the schools in the district started to implement the PDSA, R. Barnes noticed that the model appeared to be working and learning improved. On the other hand, B. Goodwin, realized that although the teachers in this district have the PDSA displayed in their classrooms and may be attempting to use PDSA, teachers do not carry out the PDSA completely. The PDSA data-driven instruction model helps monitor student academic progress to increase student achievement. School district administrators monitor school growth ratings under the Every Student Succeeds Act provision as the measurement to determine which students are meeting the academic standards (U.S. Department of Education, 2015a). According to this local school district's 2014 state report card, the school district earned an *at-risk* growth rating. The leaders in the district have voiced concern about student growth and achievement.

There was evidence from administrators that the prescribed model was flawed. Several administrators, such as B. Sawyer, mentioned that some of the data walls of several teachers' classrooms were incomplete and showed only benchmark results and not the other parts of the PDSA. Therefore, there was a need to understand how teachers constructed data walls, how the teachers used the data walls to guide instruction, and what support the district provided to ensure the teachers used data walls to focus on improved student performance. Although district leaders required teachers to analyze data and set up active classroom data walls, there appeared to be no consistent practice for implementing the PDSA. For instance, there was no information on the data wall to show a plan for what the teacher was teaching, what the teachers and students would do during the learning cycle, documentation of the results the teachers studied, and actions

to improve. In addition, some results of classroom assessments were not readily available. As administrators visited the classrooms for observations—to look for lesson plans, class missions, learning targets, periodic formative assessment results, and benchmark results of the evaluation to be posted near the data walls—not all teachers displayed these components on the data wall. B. Goodwin noticed that there was also inconsistency within the classrooms, because some teachers used the PDSA at the beginning of the school year, but deviated from it as the school year progressed. One teacher, H. Larkin, mentioned that the teachers in the local school are still doing parts of the PDSA, but the teachers had no time to maintain the PDSA in a conspicuous place. J. Smalls, one of the school leaders required teachers to conduct and participate in grade-level Professional Learning Community (PLC) meetings that focused on data analysis, so that the grade level teachers could support each other when constructing and updating the data walls. Leaders in education recognize PLCs as an intervention to assist teachers in bridging the data and practice (Marsh, Bertrand, & Huguet, 2015).

Although teachers displayed data walls on the bulletin boards in their classrooms, data walls alone cannot bring about instructional improvements in the classrooms (Bernhardt, 2013). For classroom teachers, constructing, maintaining, and focusing instructional plans on the results of the analysis of data which are displayed on a data wall offers teachers and students with a visible focal point to guide planning and learning. When educators monitor and review student assessment data and plan lessons from the data, they are choosing to actively direct student learning and not leave student learning

to chance (Bernhardt, 2013). Systematic data analysis allows teachers to identify student academic growth.

The purpose of this qualitative case study was to identify elementary- and middle-level teachers' perceptions about using the PDSA to analyze data in the classroom and using that data to inform classroom instruction. Love (2008) suggested that teachers use data as a mirror to reflect on instructional practices and make improvements that may result in an increase in student achievement. The findings drawn from teacher perceptions may indicate a need for more professional development (PD) to help support the gaps in the prescribed model.

Definition of Terms

The following terms helped to guide this study. These terms are associated with data to inform instruction. Definitions may vary, but the meanings of terms listed for this study are below.

Culture: In this study, culture refers to a constellation of variables that affect student success, teacher work and the envisioning and achievement of shared school goals. (Wu, Hoy, & Tarter, 2013)

The culture of data uses: Culture of data used refers to ongoing support to help educators explore how to use data to inform ongoing instruction. The culture of data implies that data analysis and use consistently done (Gerzon, 2015).

Data: Data are information that educators organize in some way to help them know more about students (Wayman & Jimerson, 2014).

Data coach: Persons who provide specific guidance on interpreting and using data; this person may be assigned to one school, shared among a set of schools, and/or linked with the central office or another intermediate organization (Love, 2008).

Data-driven decision-making: Data-driven decision-making pertains to a process applied in the classroom (and other levels of the educational system) by teachers and administrators to collect, analyze, examine, and interpret data to guide educational decisions (Ikemoto and Marsh, 2007; Mandinach, 2012).

Data use: Wayman and Jimerson (2014) found data to use to be the activities educators engage in as the educators collect and organize data so that they can analyze and use data to draw meaning from them to inform practice.

Data team: In this study, data teams take the form and name of PLCs (Nelson, Slavit, Perkins, & Hathorn, 2008).

Professional development (PD): PD is the primary means of providing support to educators to establish effective data use practices (Gerzon, 2015).

Professional learning community (PLC): A PLC involves relationships among colleagues that bring about instructional improvement (Horn & Little, 2010). PLCs involve collaborative work among peers who bring diverse knowledge and expertise to the analysis process. A lead teacher or facilitator guides PLCs and the PLCs influence teachers' thinking and practice (Marsh et al., 2015).

Significance of the Study

This study may provide district leaders with insight on how to help teachers use student data to adjust and improve instructional practice. District leaders will be able to

recognize strengths and weaknesses in using the PDSA for data analysis. The study may help identify gaps in teachers' knowledge about how to implement the districts prescribed data analysis model and foster teacher collaboration about data during PLC time. This study could bring about social change because teachers can benefit from training on data analysis and the teachers can gain personal insight about the levels at which the teachers personally use and analyze data. Most importantly, a 3-day PD was designed for teachers to increase their understanding of a collaborative culture that fosters data analysis to improve instruction, to use PDSA to monitor student data collaboratively with teacher teams, and to engage students in the process of continuous improvement According to Knapp, Swinnerton, Copland, and Monpas-Huber (2006), when implementing a PD to help develop a culture of data use, the PD must provide constructs, tools, and resources that would be useful to districts over time. A PD should also provide support to meet the needs of novice or expert on the developing data use practices.

Research Question(s)

The local school district leaders have mandated that Grades 3-9 elementary- and middle-level teachers use the prescribed PDSA to facilitate data-driven instruction to improve student achievement; however, not all teachers are able to monitor academic progress effectively using PSDA. Identifying why elementary- and middle-level teachers are unable to use the PDSA to analyze data in the classroom to inform classroom instruction could allow the district to implement practices that would improve support with using the PDSA.

I designed the following research questions to identify elementary and middle school teachers' perceptions about using the PDSA to analyze data in the classroom and how that data can inform classroom instruction. Additionally, the goal of this study was to determine support needed for elementary and middle school teachers to use the PDSA. The following research questions guided this study:

RQ1: What are elementary and middle school teachers' perceptions about utilizing the PDSA for analyzing data in the classroom?

RQ2: How do elementary and middle school teachers use assessment data to inform classroom instruction?

RQ3: What professional development support can help elementary and middle school teachers to use analyzed data to inform classroom instruction?

Review of the Literature

Introduction

Teachers face a growing need to improve instruction to increase student performance daily. To increase student performance, the focus must shift from what the teacher teaches to what the students actually learn. Teachers can focus on student learning by creating a data-based environment that can drive academic excellence. The chosen conceptual framework guided how assessment, analysis, action, and culture can build effective data-driven instruction (Bambrick-Santoyo, 2010).

This literature review provides an overview of the research used to focus on the difficulty some teachers in the local school district have in using the PSDA to facilitate data-driven instruction and improve student achievement. To address this problem, I

examined and synthesized the following topics: (a) data informs instruction, (b) teachers use data in the classroom, (c) implementation of a data-driven instructional model, and (d) PLCs support teachers' implementation of data-driven instruction. To search this information, I used Google Scholar with library links to Walden University Library and online education databases such as ERIC, ProQuest, and Education Research Complete because these databases contained peer-reviewed articles published within the last 5 years. Some literature was used from earlier than 5 years ago to show historical viewpoints. The following search terms were used to exhaust the literature on the following topics: *data, data to inform instruction, data-driven decision making, data-driven instruction, data walls, data and aligning the curriculum, best practices of using data to inform instruction, student data to identify teacher weaknesses and strengths, ways teachers use data to inform instruction in the classroom, differentiation, and data-driven instruction, PLC, data-driven instruction, data-driven instructional systems,* and *how teachers use data to inform instruction.* In addition, Boolean phrases such as *data* AND *improved instruction*; *data* AND *informed instruction*; *best practices* AND *teacher data use*; *school culture* AND *data use*; and *professional learning communities* AND *educators' data use*, were used to saturate the literature. Lastly, I searched the terms *formative assessments, benchmark assessments, and summative assessments* using Google Scholar and the leads to other databases. I conducted the review of the literature to build an understanding of topics related directly to data-driven instruction.

Conceptual Framework

The conceptual framework for this study was Bambrick-Santoyo's (2010) principles for effective data-driven instruction. The principles of Bambrick-Santoyo provided a structure for teachers' research and reflection to guide the teacher's collection and analysis of student performance data. The following four principles are the fundamental concepts that grounded this study: (a) assessment, (b) analysis, (c) action, and (d) culture. Bambrick-Santoyo (2015) asserted that rigorous assessments drive instruction when teachers analyze students' shortcomings and strengths and when the teachers act by creating instructional plans from the analysis. Teachers need to have a supportive environment for data analysis to happen. Culture is about creating an environment that supports data-driven instruction. Like other reforms, educators can layer data use on top of already established routines (Hubbard, Datnow, & Pruyn, 2014). These are important concepts that build on each other, and that creates a system to help teachers effectively assess and analyze student performance. As advised by Conderman and Hedin (2012), teachers can no longer wait until the end of an instructional cycle or grading period to review student data because that can result in missed opportunities for reflecting about the teacher's instruction and making instructional adjustments. Edman, Gilbreth, and Wynn (2010) and Shute and Kim (2014) found that many teachers are not using formative assessment data to inform future instruction.

Bambrick-Santoyo's (2010) principles of effective data-driven instruction are aligned with the local district's PDSA. This conceptual framework provides a tested strategy for data-driven instruction that is key to explore the problem of teachers'

inconsistent practices using the district's prescribed data-driven instruction plan. Additionally, this conceptual framework supports the idea of teacher collaboration to guide teachers' data practices. A healthy school data culture supports the use of data in everyday instruction and school-wide improvement (Hagen & Nordmeyer, 2013). In order for teachers to use the PDSA, teachers need to strengthen the use of assessments and culture to support data analysis. Research shows that educators around the world face growing expectations to use data to improve instruction, and educators need support in order to do so (Farley-Ripple & Buttram, 2014).

I examined teacher perceptions and instructional practices through the conceptual framework of Bambrick-Santoyo's (2010) principles for effective data-driven instruction. This framework supported my study because the principles emphasize the need for the fundamental concepts that ground this study: assessment, analysis, action, and culture. This conceptual framework provided a critical lens to define and to analyze data that from the research questions. The research questions were focused on the practices that third through ninth grade teachers are using to analyze data. The framework for this study was aligned with a qualitative case study approach that allowed me to gather the perceptions of teachers about how the teachers are using PDSA to analyze data and what support is in place for using the PDSA. I analyzed the collected data against the Bambrick-Santoyo model to look for strengths and weaknesses among the practices of the participants. From the collected qualitative data, I sought to uncover rich descriptions of the perceptions, practices, and experiences of teachers as the teachers use the district prescribed model.

Effective data-driven instructional approaches anchored this study because the approaches provided a framework to examine and to understand teachers' uses of data-driven approaches. This conceptual framework served as a tool for research and reflection to understand data-driven instruction better and the strength of a school culture to support the development of teachers' capacities. This framework supported my project study because the emphasis was on exploratory learning by teachers to strengthen teachers' use of data to drive instruction.

<div align="center">**Review of the Broader Problem**</div>

Data Informs Instruction

The idea of using data to inform instruction does not start in the classroom. Lawmakers have placed demands on educators through legislation, such as NCLB and the Individuals with Disabilities Education Act of 2004 (U.S. Department of Education, 2004), to use data in classrooms to measure student progress toward meeting proficiency levels in high-quality assessments and to inform instruction continuously to promote educational excellence. In addition, the data provide information, which teachers can use to understand students' academic strengths, weaknesses, and learning needs (U.S. Department of Education, 2004; Yell, Shriner, & Katsiyannis, 2006). Leaders in education expect schools to have data available as a part of the school's state annual review processes (Ehren & Swanborn, 2012).

The implementation of accountability systems such as NCLB, Every Student Succeeds Act, and Race to the Top placed a new focus on data and student achievement. However, as discovered by Slavin, Cheung, Holmes, Madden, and Chamberlain (2012),

although helping school leaders understand student data is beneficial, that alone will not bring increases in student achievement. Schools should take actions to adjust teaching and learning. There are many benefits for schools to use data effectively: (a) leaders hold schools accountable for student progress, (b) teachers may improve instructional decision-making, and (c) students may achieve more success in learning (Schildkamp, Ehren, & Lai, 2012). As teachers review data, they should be mindful not to use the data to make final decisions about student learning, but instead use them to drive decisions about instructional strategies to help improve students' academic progress (Davidson & Frohbieter, 2011). Teachers should analyze data to reveal students' weaknesses and proficiencies so that the teachers may consider the weaknesses and strengths in future lesson planning. School districts should require teachers to make data analysis a part of the teacher's daily instruction (Means et al., 2010).

Data analysis is important because analyzing data allows teachers to identify student' weaknesses. In addition, data analysis allows teachers to continuously adjust and improve teaching practices in the classroom. Furthermore, data analysis allows teachers to advance learning by employing new and different ways to address the needs of struggling students (Means et al., 2010). Data analysis has become a prominent strategy used by teachers for improvement in public schools (Coburn & Turner, 2012). Means et al. (2010) showed that school districts are devoting more time to data-driven decision making to improve teaching and learning. More importantly, teachers can continuously use data to drive instructional decisions and to improve their ability to meet students' needs. Often educators only use data evidence to address struggling students; this

singular focus could create a problem of equitable practices (Hamilton et al., 2009). As noted by Holcomb (2013), teachers should analyze data to tailor instruction to differentiate instruction to address all student needs, including students who have mastered the material. Researchers recommend that teachers use a data in a continuous cycle to obtain insights about instruction and student progress (Hamilton et al., 2009). As teachers use data continuously, they may improve learning for both the individual students and the entire class (Datnow & Hubbard, 2015). Although policy-makers play a vital role in using data to inform instruction, teachers are in the best positions to judge students' needs and abilities to choose the most suitable methods for successful learning (Wohlstetter, Datnow & Park, 2008). One way teachers can use data to identify student ability and address learning is by using assessments, data-driven instructional systems, and support for data-driven instruction.

When collecting data to inform instruction, use of assessments is important. In fact, according to Bambrick-Santoyo (2010), assessments are the number one principle of data-driven instruction. Using data to inform instruction is about assessing for learning (Petrides, 2006). Data analysis in the PDSA is an approach used by teachers to identify and manage students' performance and to plan the lesson content based on what students need (Wiemen. 2014). Teachers can use several types of assessments to provide data needed to inform instruction in the classroom: formative, benchmark, and summative. Formative assessments (assessments *for* learning) provide data that can help improve teaching and learning (Candal, 2016; Crisp, 2012; Mandinach, 2012; Shute & Kim, 2014). Benchmark assessments (Bambrick-Santoyo, 2010) and summative assessments

(assessments *of* learning) provide information about what students have learned (Candal, 2016; Crisp, 2012; Mandinach, 2012; Shute & Kim, 2014). In the next sections, I present the literature about these formative and summative assessments.

Formative assessments. Formative assessments provide feedback that teachers can use immediately to plan and adjust ongoing instruction (Wolf, 2011; Picus et al., 2010). Herman, Osmundson, and Dietel (2010) further expressed that formative assessments are "embedded in ongoing classroom instruction to inform immediate teaching" (p. 2). Formative assessments allow teachers to monitor students' understanding and adjust instruction to increase learning (Candal, 2016). Teachers collect data from formative assessments in several ways. For example, teachers may observe students by scanning classes for signs of misconceptions and understanding by asking questions and by examining student work; these are common practices within data-driven decision-making (Mandinach, 2012).

Researchers identified formative assessments as good ways to evaluate student learning and to improve instruction (Cornelius, 2013). Candal (2016) suggested, based on leader responses, that sophisticated formative assessments and data-driven instruction provided students with unique educational experiences in a charter school. Candal also revealed best practices to help students achieve, such as the use of data from weekly assessments. Weekly assessments allowed teachers to see what concepts individuals and groups of students mastered, and the assessments provided immediate feedback from which students and teachers set learning goals (Candal, 2016). Marsh et al. (2015) also emphasized that explaining results to students helps students to learn to self-reflect about

test results. Dixson and Worrell (2016) pointed out that educators do not administer all

formative assessments weekly. Some formative assessments are spontaneous such as

question and answer sessions and when a teacher calls on a student to give an example of

a concept that the teacher just covered in class. Other examples of formative assessments

are exit slips (Cornelius, 2013), homework, and quizzes (Dixson & Worrell, 2016).

Formative assessment is a form of assessing *for* learning (Hoover & Abrams, 2013;

Mandinach, 2012). According to Fisher and Frey (2012), formative assessments that use

rapid analysis and action are an effective way to adjust instruction to meet students'

needs so that teacher does not spend time reteaching to students who have mastered the

concept. By contrast, Bambrick-Santonyo (2010) warned against administering too

frequent assessments because teachers cannot analyze the data deeply without burning

out. Despite the challenges, there is a link between formative assessments and improved

student achievement (Hoover & Abram, 2013; William, 2004).

Formative assessments help to understand what students know and still need to

know. The strategy of using formative assessments as a guide enables teachers to focus

during lesson and classroom instruction planning. If teachers begin planning lessons with

questions such as What do I want my students to be able to do, how will I know they

have mastered the concepts?, then they can begin to integrate formative assessments

(Ridell, 2016). Furthermore, Gregory and Kuzmich (2014) stated that the information

collected by teachers every day has a significant impact on student growth. Despite this,

Edman, Gilbreth, and Wynn (2010) and Shute and Kim (2014) found many teachers are

not using formative assessment data to inform future instruction. As indicated by Candal

(2016), when using formative assessments, teachers are no longer the center of the assessment process, but instead the teachers and students become partners in the learning process.

Benchmark assessments. As implied by Herman et al. (2010), benchmark assessments fall between formative and state assessments. These authors defined benchmark assessments as "assessments administered periodically throughout the school year, at specified times during a curriculum sequence, to evaluate students' knowledge and skills relative to an explicit set of longer-term learning goals" (Herman et al., 2010, p.1). Many districts throughout the nation use benchmark assessments to raise student, school, and district achievement (Henderson, Petrosino, Guckenburg, & Hamilton, 2007). Within the data use movement, benchmark assessments have been the primary focus of data (Datnow & Hubbard, 2015). These interim benchmark assessments are routine, periodic assessments of student progress that are administered more frequently than the once-a-year summative assessments (Picus et al., 2010), but less often than weekly formative assessments. According to Herman et al., (2010) benchmark assessments are strategically located in the middle of other assessments, and the benchmarks are uniform in time and content across classrooms. Interim benchmark assessments are critical assessments that drive gains in student achievement. Teachers should administer the interim assessments at least quarterly (6 to 8 weeks) so that teachers can identify weaknesses and correct them promptly (Bambrick-Santoyo, 2010). As suggested by Slavin et al. (2012), benchmark assessments can be useful if teachers use findings from assessments to determine the areas in need of intervention. School district administrators

implement interim assessments to monitor student progress toward goals with enough time to adjust instruction (Abrams, Varier & Jackson, 2016). Interim assessments give a picture of what students have learned, and the interim assessments enable teachers to change individual pace and teaching strategies so that students can master the content and materials (Picus et al., 2010).

Slavin et al. (2012) noted that school districts that are data-driven, administer benchmark assessments to determine whether students are on track to improving on state assessments so that teachers can make changes early. The researchers also identified that benchmarks do predict students' performance on state assessments, but emphasized that teachers should not use data from benchmark assessments for predicting state assessment scores (Slavin et al., 2012). Therefore, teachers should align the content and format of benchmark assessments with academic goals, including college-ready and career goals, and end of the year tests. These types of assessments have a ripple effect since benchmark assessments can drive lesson planning, unit planning, improved end of the year results, and other assessments that check for understanding at that moment (Bambrick-Santoyo, 2010). Benchmark assessments provide a roadmap for instruction aimed at improved teaching. Benchmark assessments target instructional strengths and weaknesses, offer accountability, allow visual evidence of improvement, and prepare students for high-stakes tests (Slavin et al., 2012). When teachers use benchmark assessments along with formative assessments, these assessments together can help to facilitate substantial alignment among standards, daily instruction, and year-end evaluations (Abrams et al., 2016). Polikoff and Porter (2014) pointed out that when

teachers align content standards, instruction, and assessments students' knowledge of standards content will improve. Furthermore, Herman et al. (2010) stated that benchmark assessments could help align curriculum and instructional planning with content standards and learning goals. Benchmarks monitor learning to provide teachers with information on students' strengths and weaknesses so that this new information can be used to adjust curriculum and instruction; benchmarks communicate expectations for learning and predict future performance on end-of-year state tests (Herman et al., 2010).

Benchmark assessments are periodic tests done to measure learned material. As pointed out by Marzano (2003), it is a big mistake to use measures of student learning that do not connect to the learning. Therefore, district leaders and teachers should administer more frequent, periodic assessments such as benchmark and formative assessments, daily and throughout the year to examine student data. When teachers systematically document data at the beginning, middle, and end periods, teachers can readily make decisions to inform instruction to meet student needs (Joseph et al., 2014). Tomlinson and Imbeau (2010) believed that differentiation and assessments could address the diverse skills of all learners.

Summative assessments. Summative assessments are evaluations that administered after a unit of study to evaluate the program outcomes based on student learning and evidence of teaching and learning (Hoover & Abram, 2013). Teachers can use the data at the end of the instructional cycle to see what students have mastered (Hoover & Abrams, 2013; Burke, 2014). Summative assessments are usually graded exams that teachers administer at the end of instructional periods (Dixson & Worrell,

2016; Tomlinson & Moon, 2014). Some examples of summative assessments include mandated state tests, term papers, college entrance exams, final exams, performance-based assessment, and other final performances (Dixson & Worrell, 2016). These assessments should align with what students must know, understand, and be able to do so teachers can determine mastery (Tomlinsom & Moon, 2014). The assessments also show how much learning has taken place and the teacher use the data primarily for progression purposes (Crisp, 2012). The data from summative assessments can also help schools improve over time and school may use the results for accountability at the district and state level (Picus et al., 2010). Moreover, Johnston and Lawrence (2004) argued that educators should use data from assessments in a more student-centered way to inform instruction that is sensitive to the needs of students. The goal of summative assessments is to measure the level of success or proficiency that students obtained at the end of an instructional unit. Summative assessments also provide valid, reliable, and fair measures of students' progress toward skills necessary for the students to be college-and-career ready (Dixson & Worrell, 2016). Moreover, end of instruction assessments "gather data about student performance with regards to learning outcomes" (Gupta, 2016, p.44). Although summative assessments provide summary data, teacher may use the data derived from the assessment similarly as formative assessments are because teachers can look for patterns in student achievement that may suggest the need to modify the way the teacher teaches the content next year (Tomlinson & Moon, 2014). Beaver and Weinbaum (2013) conducted a three-year study at 11 elementary and secondary schools and found that state standardized tests do not provide a dynamic picture of individual student

performance over time. Gregory and Kuzmich (2014) also emphasized that the data provided by high-stakes tests are only one piece of evidence about student learning. As pointed out by Herman et al. (2010), there should be a balance between the use of formative, benchmark, and state assessments to provide indicators of how students are doing relative to learning standards.

Summative assessments are typically annual standardized tests that measure school quality, that identify school performance on state-established standards, and that provide a basis for performance comparisons across schools (Picus, Adamson, Montague, & Owens, 2010). In most states, educators administer yearly-standardized assessments at the end of the academic school year, and the state does not return results until August of the following academic year. This late feedback becomes complicated for teachers to use the data to adjust instruction immediately. In fact, Bambrick-Santoyo (2010) stated that teachers promote students to the next grade level by the time teachers receive the results from assessments in the fall. The late feedback is problematic because students may lack basic proficiency in concepts the students were supposed to learn. When the state reveal test results that late, teachers cannot use the assessment results to inform instruction (Bambrick-Santoyo, 2010).

In contrast, Beaver and Weinbaum (2013) conducted a study in which one high school used eighth-grade state test scores to place students entering the ninth grade in tracked reading and math class and provided tested content and test-taking skills to the lowest tracked class. As stated by Murray (2014), the placement process is a clear indication that student achievement data is important, but educators must connect the data

to other school data to enhance student learning. State standardized tests have an important place in education. Beaver and Weinbaum pointed out that one way to use the state assessments data is by realigning the school's curriculum to fit the standardized test.

In summary, data from assessments come in multiple forms; teachers can use these data to guide teaching and to identify student needs. Of the three types of assessments, according to Hoover and Abrams (2013), formative and benchmark assessments, provide data that used teachers can use to inform instruction immediately. Formative assessments appear to be the best tool to inform instruction. Bambrick-Santoyo (2010), noted that benchmark assessments are the most important tests to have practical data-driven instruction and drive academic excellence. These assessments provide teachers with the data to monitor student growth toward state standards (Herman et al., 2010). Beaver and Weinbaum (2013) also found that half of the schools in the study prioritized benchmark assessments to collect data that are more meaningful in response to limited state data. However, Mandinach (2012) shared that all forms of assessments contribute to student achievement in some way, and teachers can use the assessments to inform instruction. Teachers should be able to translate the data to take action that will inform instruction; effective data use requires going beyond the numbers from a test and making meaning of the data. (Mandinach, 2012).

Crisp (2012) stated that formative and summative assessments are the two most common types of assessments. Researchers noted formative and summative assessments to be necessary to provide a more accurate picture of student learning, and the two assessments should complement each other (Burke, 2014; Dixson &Worrell, 2016).

However, as determined by Hoover and Abrams (2013), researchers have portrayed formative assessments as the *good* assessments and summative assessments as *bad* assessments. Formative and summative assessments differ in purpose and in how the data is used (Hoover & Abrams, 2013). Therefore, teachers should realize that they should not examine formative assessment data in isolation, but instead they should align with data from summative assessments (Gulikers et al., 2013). Herman et al. (2010) advocated the use of a balanced assessment system in which multiple formative assessments feed into each benchmark assessment and multiple benchmark assessments feed into annual summative assessments.

In conclusion, there are several assessments available for teachers to use, and the work of Bambrick-Santonyo (2010) can be used to support approaches teachers might use with assessment data to make them more meaningful to drive instruction. When teachers align formative, benchmark, and summative assessments with college and career standards, the assessment alignment provides vital data and direction that can expand on student learning goals (Marsh et al., 2015). Although proper assessments provide a vast amount of data, educators must record the data in a readily useful way to support reliable analyses (Bambrick-Santoyo, 2010). Teachers can use data can be used to inform instruction by gathering information about learning (Wieman, 2014); teachers should ensure that appropriate materials are being assessed. Bambrick-Santoyo noted that there is disconnect between what many teachers teach and what assessments the teachers give to students. As teachers plan classroom instruction, teachers should consider using several types of assessments for different purposes. Some assessments happen within

lessons, within units, across units, and annually depending on the needs of various

stakeholders (Moss, 2013). According to Little (2012), there is undeveloped research on

what teachers do daily to examine and interpret student data. Data-driven decision-

making is one of the most prominent reform strategies (Datnow, Park, & Kennedy-Lewis,

2013), but as revealed by Demski and Racherbäumer (2015), there is little research on

what sources of data are useful for practitioners. Teachers also use data-driven instruction

as an approach that targets instruction more efficiently (Bambrick-Santoyo, 2010). The

intention of assessment data is to inform instruction and guide instructional decisions to

raise student achievement (Abrams et al., 2016). As suggested by Bambrick-Santonyo,

interim assessments are the key assessments that drive change, make dramatic gains in

student achievement, and inform effective data-driven instruction. However, as

mentioned by Hamilton et al. (2009), the quantity of data is not what matters most when

it comes to improving teaching and learning. Instead, what matters is how educators use

the data. The next section will discuss the ways teachers use assessment data in the

classroom.

Teachers' Use of Data in the Classroom

Teachers can use data to identify strengths as well as weaknesses in teaching

(Protheroe, 2001; Fox, 2013; Wieman, 2014) Protheroe (2001) investigated evidence that

high-quality data can improve instruction even though it is a complicated process. The

use of assessment data to inform practice has become an important part of teaching and

learning (Hoover & Abrams, 2013). Many states are using data from standardized test

scores in the context of a teacher evaluation system to determine student growth or value-

added by teachers. Some other states have begun to use models to do monitor value-added (Collins & Amrein-Beardsley, 2014). "Value-added models (VAM) estimate teachers' influences on student growth over time, and as such, states are using them for more consequential purposes" (Collins & Amrein-Beardsley, 2014, p. 2). However, in the state of South Carolina, where I conducted this study, there is no legislation requiring the use of VAM. Education officials of this state have chosen to use student work samples so that all teachers can partake in the process and not just core curricular teachers (Harris, 2011 as cited by Collins & Amrein-Beardsley, 2014). States such as Maryland, Kentucky, and New Jersey use school-level data from supplement assessments, benchmark assessments, student portfolios, and other local data to measure student growth (Collins & Amrein-Beardsley, 2014). Researchers found that of the 22 states piloting or implementing the "growth and value-added models, not one state representative was able to articulate a statewide plan for formative data use" (Collins & Amrein-Beardsley, 2014, p.9). Collins and Amrein-Beardsley (2014) suggested that the benefits that should come from these models are improving teacher effectiveness and requiring data use. However, it appears that most states have focused on measures of teacher effectiveness. On the contrary, some states pointed out that teaching consists of collective, cumulative efforts that occur year-round and not just by capturing growth from one test (Collins & Amrein-Beardsley, 2014). These findings are an indication of the importance of doing check-ups throughout the year.

Marsh et al. (2015) reported several common ways teachers use data from assessments, including posting and sharing data as a focal point for establishing learning

goals, for lesson planning, for differentiating instruction to meet the needs of all students, and for creating Response to Intervention (RTI) plans. Teachers should give assessments, disaggregate the data, and plan ways to share the data in the classroom. One way that teachers can share data with students is by posting them on data walls. Candal (2016) pointed out that sharing information with individual students about personal performance on tests is a way to use data as a student-centered strategy. Candal (2016) suggested that many schools should adopt the data-driven instruction practices of the charter school in his study, which include posting data by student ID and sharing that information with the students. This exchange of information can help to foster a culture focusing on self-improvement (Candal, 2016). Teachers may also use the data gathered from the assessments to set learning goals, modify instruction, and support students as needed. Marsh et al. (2015) reported that teachers respond to data by re-teaching topics and by providing students with extra support outside the classroom; after the students have already learned the material.

One example of how the data to use data to inform instruction comes from doing research in exemplary settings (Lachat & Smith, 2005). Lachat and Smith (2005) showed that teachers use data in classrooms to group students, to re-group students, and to adjust instruction. Mandinach (2012) provided this supportive example of acting in response to data. When a teacher has data that shows some students are struggling, the teacher should examine the data, verify the causes of the learning problem, put instructional strategies in place to remediate the problem, and monitor the revised plan. Marsh et al. (2015) recommend this to improve student achievement. Jennings (2012) found that teachers

respond to data in a way that does not have a long-term effect on improving student achievement. Abrams et al. (2016) mentioned that teachers sometimes use data narrowly to focus on children who are close to passing and to direct remediation efforts toward them. Another response used by teachers is asking students to reflect on results (Madinach, 2012; Marsh et al., 2015; Candal, 2016). Teacher should teach students to examine test scores and classroom assignments (Madinach, 2012). However, Zimmerman and Schunk (2001) pointed out that not all students can self-monitor and may lack self-regulatory skills. On the contrary, Madinach (2012) believed that educators could teach self-monitoring skills. In addition, this researcher believed that students should be taught to set learning goals and data should be a part of an ongoing cycle of instructional improvement (Abrams et al., 2016). These findings support the PDSA that is in place at the local school district that is under study. Hamilton et al. (2009) recommended that teachers use data to inform instruction in a systematic way. Using the PDSA is one way to systematize data analysis to inform instruction since it is a systems approach to improving classroom results (Jim Shipley & Associates, 2012). Ultimately, all parts of the PDSA provide a systematic way for teachers to post and share data from assessments with students. However, teachers must scaffold through the process so that students can set and monitor learning goals.

Although Candal (2016) and Marsh et al. (2015) revealed some practices of using data in the classroom, it is important to note that Rose and Fischer (2011) found that effective data use in the classroom is underdeveloped and largely ignored in some cases.

Similarly, Little (2012), indicated that limited research had been done to show actual practices that teachers engage in when using data in the classroom.

Implementation of a Data-Driven Instructional Model

Mandinach (2012) showed that effective leaders in education, including policy-makers and educators, have made many attempts to use data to guide instructional planning, but the early efforts were not systematic. "DDDM [Data-driven decision-making] pertains to the systematic collection, analysis, examination, and interpretation of data to inform practice and policy in educational settings" (Mandinach, 2012, p. 71). The data can be used to diagnose student learning and then target instruction, so the educator can make informed decisions about beginning instructional levels, instructional approaches to teaching content and skills, and student attainment of performance standards (Conderman & Hedin, 2012; Joseph et al., 2014). Academic skill diagnosis allows teachers to pinpoint the exact skills that students need to learn by analyzing the data from assessments (Bambrick-Santoyo, 2010; Joseph et al., 2014). Furthermore, the researchers at Learning Points Associates (2004) created a guide which pointed out that educators are aiming for high-quality learning and optimum student achievement. In addition, researchers at Learning Point Associates asserted that school improvement should be continuous, without a beginning or end, and the group of researchers recommended using the PDSA cyclic school improvement model. When implementing the cycle of the PDSA, first teachers are required to create a plan for learning to identify specific learning goals and to specify how the learning goals will be measured (Jim Shipley & Associates, 2012). When teachers share objectives in class, teachers help

students focus attention on learning, and teachers identify a plan for teaching (Hill & Miller, 2013). Teachers should give students opportunities to set learning goals, and expectations must be made clear (Mandinach, 2012). Teachers should make students aware of the expectations or learning goals before the lesson begins. This notice gives students a chance to know what the students will be responsible for learning and what the teachers will assess in the end. Wong and Wong (2005) revealed that direct instruction takes a person through learning steps systematically, helping the learner see both the purpose and the result of each step. Direct instruction allows the teacher to guide students along the way so that the students may reach the goals established in the beginning. After the teacher establish and set clear learning goals, teachers can scaffold or walk students through steps before giving them a task to complete. It is vital for teachers to provide appropriate support and guidance for students (Blackburn, 2008). Teachers can also teach students to set and monitor personal learning goals.

The next phase of the cycle in the district's prescribed model includes determining strategies that the teacher and students will do to ensure that everyone learns the targets that the teacher set according to state standards. This process involves the teacher monitoring ongoing evaluations (Jim Shipley & Associates, 2012; Mandinach, 2012). Teachers use data to provide appropriate instruction to each student based on individual learning needs. Teachers' roles are complicated and disparate because students are diverse in individual readiness and capacities to learn. According to Smit and Humpert (2012), differentiated instruction is "an approach that enables teachers to plan strategically to meet the needs of every student" (para. 7). This differentiation not only

requires teachers to generate data and use it to inform instruction but also to measure the effectiveness of education; differentiation is critical to the success of teachers and students (Tomlinson & Moon, 2014). Holmes, Miedema, Nieuwkoop, and Haugen (2013) did one study, and the study revealed that although teachers are responsible for analyzing formative and standardized summative assessments to identify trends and weak spots to adjust instruction, teachers lacked the ability to translate the results into teaching that can benefit individual students and the whole class. The data received from individual students usually remained individualized, and teachers struggled to provide whole class effective interventions. Students come to class with diverse gifts, talents, and ways of learning. The teacher must tap into these diversities so that every child is successful in class. One way to tap into diverse ways of learning is through differentiation.

Although teachers should use direct instruction, the teachers should keep the use of direct instruction to a minimum to reach every child. Instead, teachers should look at the data from assessments and use them to provide learning that will fit each student's needs. This practice will bring all students to the learning goals that teachers set at the beginning of the cycle. "For most teachers, it means creating lessons that include different elements to meet the needs of each student in a diverse classroom" (Blackburn, 2008, p. 25).

The next phase of the PDSA is when teacher and students study the results of the assessments. The study is the phase that involves progress monitoring by the teacher and allowing students to reflect on results from classroom assessments (Jim Shipley & Associates, 2012; Mandinach, 2012; Marsh et al., 2015). Teachers are required to hold

student conferences to discuss the student's assessment results during this step. Candal (2016) noted that teachers could use discussions in these conferences as opportunities to reteach concepts and engage students in a process to learn the material differently. When looking at results, teachers should use good judgment to determine what students need to learn most and teach the content effectively (Babrick-Santoyo, 2010). One way to analyze the data from assessments is by looking at the data on three levels: (a) the standards-level view indicates students' performances to the same standards; (b) the overall analysis view compares students' performances between classes, and (c) the item analysis or question level view examines student responses to specific assessment questions. Kerr et al. (2006) interviewed teachers and found that item-analysis involves the breakdown of student needs by objectives and identifying topics that require re-teaching. Bambrick-Santoyo (2010) noted that item-analysis is the single most important driver of student achievement. Item-analysis supports the study phase of PDSA since this period is when teachers take an in-depth look at the data from the assessments (Bambrick-Santoyo, 2010).

In the last phase of PDSA, teachers should consider what they will do differently and create an action plan for adjustment to the next learning cycle (Jim Shipley & Associates, 2012). Babrick-Santoyo's (2010) principle of analysis and action can provide support for using this part of the PDSA to analyze data to inform classroom instruction. RTI models also provide teachers with the skills necessary for them to develop effective interventions (Holmes et al., 2013). RTI assessments are another form of progress monitoring, and the RTI assessments allow teachers to design early intervention (Fuchs

& Fuchs, 2006). Some studies have shown that teachers can use data from assessments to provide remediation to help all students master the content. For example, teachers may group students who have mastered the content with those who have not, or teachers may reteach a lesson to the whole class if the majority did poorly on a test (Abrams et al., 2016). Teachers might respond to data from formative assessments by personalizing education for all students and then aligning the lessons to objectives (Cornelius, 2014).

Candal (2016) conducted a study of several different charter schools in Massachusetts and showed that students at these schools outperformed the students' public-school counterparts. One practice that all the charter schools studied by Candal (2016) had in common was aligning the curriculum to academic standards and state tests. He identified that it is important for teachers to create assessments so that the evaluations become the starting point of the teaching and learning cycle and not the end. When teachers create assessments before teaching, the assessments can help to ensure that teachers address all necessary skills through instruction (Bambrick-Santoyo, 2010).

Alignment of instruction and assessment provides students with a customized instructional program. When teachers use classroom assessments and interim assessments coherently, teachers create a stronger alignment among content standards, daily instruction, and year-end assessments (Abrams et al., 2016). Curriculum alignment coordinates the written, the taught, and the tested. In this process, teachers check the test content through available test sample items, examine curriculum guides to remind themselves about what should be taught, develop plans to accommodate the guides and the test, and then teach their best (Glatthorn, 1999). As noted by Abrams et al. (2016),

curriculum and content standards, instruction and assessments must all align, and each is essential. In the United States and internationally, the current emphasis is on strong alignment as an evidence-based instruction and reform strategy (Abrams et al., 2016). However, the study conducted in 1999 by Glatthorn shared that curriculum alignment could damage or strengthen the school programs. As explained by Glatthorn (1999), curriculum alignment can ensure that teachers prepare students for mandated tests. A school, curricula alignment approach does limit some of the creativity that teachers may enjoy in establishing daily plans. As emphasized by Tomlinson (2014), teachers who support learning and the learner are not just satisfied with curriculum coverage; the teacher's goal is student learning and satisfaction in learning. Furthermore, if teachers are required to use data, teachers may use the data to identify students who are close to passing and provide remediation to only them instead of remediation for all students who may need it (Abrams et al., 2016). Assessments must be transparent to allow members of the school community to know the exact skills students need to reach. Assessments should be common to allow teachers to collaborate and share ideas to create meaningfully, tracked progress toward standards for all students in a grade level. Assessments must also be interim and aligned to state tests, college readiness, and teacher instructional sequences (Bambrick-Santoyo, 2010). For example, Herman et al. (2010) recommended doing a benchmark assessment analysis to evaluate the alignment of learning goals and curriculum by reviewing the following:

    1. Is the framework used to develop the benchmark assessment consistent with the local curriculum?

2. Do the distribution benchmark assessment items match the local curriculum?

 3. Do assessment items cover the full range of cognitive demands addressed by

the local curriculum?

 4. Is there a reasonable sample of the content and cognitive demands specified in

the local curriculum (Herman et al., 2010, p. 20)?

The local school district's PDSA supports the described data-driven approaches.

However, once teachers use these methods, teachers should make sense of the data to

inform instruction (Datnow et al., 2013). Evans suggested that 'sense-making' is the act

of taking information in, framing information, and using the information to determine

actions (as cited by Cosner, 2012). Teachers mainly use data to assess students, adjust

classroom instruction, and improve teaching. The teacher can use technology to assist

with assessing students, improve instruction, and to provide teachers with professional

learning. Murray (2014) advised that analyzing data would not be effective without the

necessary technology infrastructures to store, analyze, and display them. Using data to

track progress is not a new phenomenon. In fact, many professions such as medical,

engineering, automobile manufacturing, and other areas use data to diagnose, make

improvements, make informed decisions, and solve problems (Wayman and Jimerson

(2014)). Educators still feel that data are not reliable because students and the learning

process are too complex (Wayman and Jimerson (2014). Murray (2014) expressed that

the complexity should not interfere with using data to inform and improve the teaching

and learning process. Due to the mandates of NCLB, there is more data available now

more than ever. However, data still fail to give educators all the information needed to

help children learn (Murray, 2014). To use data to inform instruction, an educator must have the ability to think about how to change practice and create intervention (Petrides, 2006). Holcomb (2013) found that when teachers collect and analyze data, teachers could make informed decisions that result in teachers tailoring instruction to meet the needs of individual students. As advised by Conderman and Hedin (2012), teachers can no longer wait until the end of an instructional cycle or grading period to review student data because teachers may miss opportunities to reflect on instructional practices and instructional adjustments. Fox (2013) found that skillful use of data allows teachers to monitor student progress and make timely adjustments in instruction. Abrams et al. (2016) found that student performance on future state assessments could motivate teachers' long-term instructional goals. Teachers may use multiple forms of data from a variety of assessments as indicators toward students' successful performance on the state assessments (Abrams et al., 2016). For data from assessments to support differentiated instruction, it should occur in three stages: (a) planning for instruction, including pre-assessment (b) implementing instruction, including formative assessment, and (c) evaluating instruction including summative assessments (Tomlinson & Moon, 2014).

How PLCs Support Teachers' Implementation of Data-Driven Instruction

DuFour's (2004b) work on professional collaboration and school culture can serve to support teachers in data-driven instruction. DuFour stated that a culture of collaboration involves teachers working together to analyze and improve classroom practices by engaging in an ongoing cycle of questions that may lead to higher student achievement (DuFour, 2004b). Eaker and DuFour (2002) developed a concept of

professional collaboration in their work on PLCs. These authors believed that teachers and students benefit when schools operate like communities by creating foundations of shared missions, vision, values, and goals. Eaker and DuFour also believed that teachers who work in collaborative teams are more likely to reach a common purpose and to focus on results. The teacher can use collaboration within PLCs as support for building teacher capacity to use data to drive instruction.

In a collaborative school culture, teachers create a collegial community in which teachers work in teams and share resources (DuFour, 2004b). Teacher isolation is removed from the daily operation of the school, and therefore teachers can work together to analyze data and to build instructional strategies (DuFour & Eaker, 2015). It is important for educators to come to some consensus about the goals of data use so that educators can work together and build valuable learning experiences (Wayman & Jimerson, 2014). Because PLCs leverage, the use of data to inform instruction (Van Lare & Brazer, 2012), building knowledge and skills to use data is a vital piece (Gerzon, 2015). When teachers maximize collective skills and talents, developed PLCs can lead to a focus on problems of practice (DuFour, 2004b). To engage fully in the PLC process, members of a team must use data from student learning to inform and improve teaching (DuFour, 2015a).

Educators around the world face growing expectations to use data to improve instruction, and educators need support to do so (Farley-Ripple and Buttram, 2014). However, many schools and districts attempt to support data use by providing structured time for collaboration (Honig & Venkateswaran, 2012). Collaboration is one of the most

critical components of data use because it allows educators to bring different perspectives (Wayman & Jimerson, 2014). Datnow et al. (2013), noted teacher collaboration to be an essential ingredient in school improvement. It is important to point out that some other studies have shown that structured time for collaboration offers scaffold support, but structured collaboration does not always predict positive school improvement outcomes (Datnow et al., 2013).

Many teachers are not prepared to use data. Schildkamp et al. (2014) explored data use practices in five countries and revealed that many national and international educators lack skills, training, and time to implement data use. Schildkamp et al. believed that school leaders should invest in professional development in the use of data. Collaboration must be the norm to create a school culture in which teachers take ownership and collectively share the responsibility for student achievement (Killion, 2011).

Teachers need a structure that will provide opportunities for collaboration and peer support. PLCs can serve that purpose. PLCs offer teachers opportunities to create and maintain a culture in which teachers collaborate and function as a team to analyze data to inform instruction. Data are best used for instructional guidance and planning through teacher collaboration because data allow teachers to be transparent about strengths and weaknesses (DuFour, 2015a). Collaborating and interacting socially with data, influences the way teachers use student data (Datnow, Park, & Kennedy-Lewis, 2012). It is important for teachers to stop hoarding strategies and ideas, and instead, work as a team so that all students can be successful (DuFour & DuFour, 2010). Student

achievement has been positively connected to teacher PLCs because as indicated by

Carpenter (2015), effective collaboration and problem-solving leads to teacher

empowerment which leads to increases in student achievement. PLCs provide a way for

teachers to receive ongoing professional learning that will allow them to stay updated

with teaching practices so that students can get high-level educational outcomes (Owen,

2014). DuFour et al. (2008) defined PLCs as being continuous, job-embedded

professional development in which teachers are committed to collaborating in an ongoing

process of collecting and acting on results to better serve students. Schools are no longer

organized as a formal system of supervision, so schools should be perceived as

communities rather than organizations (Sergiovanni, 1994). Schools that are interested in

shifting from organizations to PLCs have a goal of meeting the educational needs of

students through collaboratively examining the teacher's daily practice (Vescio, Ross, &

Adams, 2008). The term PLC usually refers to teachers working together for extended

times, analyzing and questioning practices in ongoing, reflective ways to promote and

improve student learning (Owen, 2014; Stoll & Louis as cited by Brodie, 2013).

Members of PLCs must be willing to admit personal shortcomings, to examine individual

practices, to share strengths, and to take risks to grow (Edwards, 2011). When schools

transition to form PLCs, it is not an easy task. Small schools usually have difficulties

implementing change because small schools often lack enough experienced teachers, and

PLCs can compensate for this by providing support and building capacity (Edwards,

2011). PLCs allow teachers to work collaboratively, to share and seek information, and to

share personal practices through peer observations, coaching, and mentoring (Teague &

Anfara, 2012). These interactions allow teachers to be generators of knowledge and not just seen as people who need improvement (Woodland & Mazur, 2015).

DuFour (2004b) revealed that many educational organizations, from simple grade level teams to more complex departments of education, call themselves PLCs, but do not demonstrate the learning community that the term represents. In fact, PLCs are the current "buzz" word in business and education (Owens, 2014). The term is often misused to describe a weekly data and staff meeting, but PLCs are much more than that; PLCs involve a process within a community of teachers who meet to achieve common goals (Jesse, 2007). PLC is one of the most widely used approaches to instructional improvement across U.S. schools (Woodland & Mazur, 2015). Staff members who work in schools with PLCs from communities that rely on norms, purposes, interdependencies, and professional and collegial socialization (Sergiovanni, 1994). The concept of a PLC is about improving learning by enhancing teacher practice (Vescio et al., 2008). As suggested by DuFour (2004a), utilizing PLCs for teacher education can create better communication among teachers if PLCs are organized with expectations and structured time for collaboration. Furthermore, Vescio et al. (2008) supported the idea that when teachers participate in a learning community, it leads to changes in teaching practices. Thessin (2016) advised that school leaders should build a strong team to lead the PLC's work of launching and sustaining data use effectively to improve instruction. District leaders are not able to implement the PLC process without building the principals' capacities to lead, and principals are not able to develop high-performing PLCs until the principals develop the staff members' knowledge and skills about leading collaborative

work essential to PLCs (DuFour & DuFour, 2013). Educators need leadership and direction in PLCs (Teague & Anfara, 2012) to distribute leadership and roles of team members to build leadership skills and that of other members of the team (Owen, 2014).

In a study completed by Carpenter (2015), he examined the similarities and differences between PLC-trained and PLC-untrained faculties. The faculties of two high schools did not receive training on how to use PLCs. The faculties did not have a process to implement PLCs. As a result, Carpenter found that the faculties did not value the time or see any value in having the meetings. The teachers became frustrated and indicated a preference to work in isolation. However, Carpenter identified that in the school where teachers were trained in data inquiry and where shared leadership existed, the teachers were empowered through data collection and increased student achievement; the teachers and school leaders worked together to develop a continuous improvement process that focused on teaching and learning. According to Edwards (2011), reflection time in PLCs gave less experienced teachers a chance to grow professionally. In a study done by Jones and Dexter (2014), teachers shared that PLCs were foundational for developing effective communication with each other. Continuous professional development is more likely to be achieved when teachers engage in regular talk about practice, and when administrators observe teachers and provide feedback about teaching, (Teague & Anfara, 2012).

PLCs should be built on trust because PLCs influence how open teachers are with student data and how open teachers are about sharing personal teaching strategies (Hallam et al., 2015). Researchers also recognize that PLCs have pitfalls that can lead to a lack of instructional improvement such as, grouping and timing (Dufour, 2015a).

Woodland and Mazur (2015) pointed out that if the goals of educators are to improve

teaching and student learning, then educators should allocate time to PLCs, and all

teachers, including special subject teachers, such as teachers of art and music, should

have access to a team.

As suggested by DuFour (2004b), the focus of a PLC should be on student

learning and not just teach. When educators use data in a PLC, educators build capacity

through social interaction, which plays a crucial role in selecting, interpreting, and using

data (Daly, 2012). PLCs allow schools to collect and analyze data in a way that is less

challenging and time-consuming (Vescio et al., 2008). PLCs allow data-informed

interactions to occur (Little, 2012). However, researchers should do more research on

how PLCs can help teachers use the data to inform instruction (Marsh et al., 2015). The

goal of data use is to support teachers in instructional adjustments that will ensure

students master concepts and skills (Pon, 2013). As mentioned by DuFour et al. (2008),

PLCs provide teachers with the opportunity to look at data and engage in critical

questions with a focus on student performance. These questions include the following: (a)

what do we want students to learn? (b) How will we teach them what they need to learn?

(c) How will we know when they have learned it? (d) What will we do when students

learn or struggle to learn? Educators recognize PLCs for improving student achievement

and collaboration (Hallam et al., 2015). Researchers also noted PLCs to be one of the

most powerful, cost-effective ways to improve student performance (Jessie, 2007).

Teachers' use of assessments is significant to the effective implementation of

data-driven instruction. Teachers should use student progress monitoring to make timely

adjustments to teaching. Teachers can implement effective data-driven instruction by analyzing the data from several types of assessments, including classroom and state assessments and adjust instructional strategies so that student achievement improves. For teachers to improve student achievement in the classroom and on the high-stakes test, then the curriculum teacher use in class should align with what students must know and what the state will test. Teachers must teach the curriculum in a way to ensure that all students can learn and teachers must be able to measure students' learning. Teachers can do these teaching methods by using differentiation and checks along the way by administering benchmarks and other assessments to see if the students are learning the content in the curriculum. Teachers should be able to differentiate instruction, and if students are not learning the material, then the teacher should adjust instructional strategies so that the instruction will provide remediation and enrichment as needed. One way to provide remediation and enrichment is through RTI groups. Timely adjustment practices may also include differentiated instruction by grouping students, allowing them to work alone, or working with them one-on-one. Dobbie &Fryer, (2013) conducted a study at 35 charter schools that showed high achieving schools used more differentiated instruction compared to low-achieving schools. Because analyzing data is a complex process, teachers must be able to analyze the data systems to make sense of the data and use it to inform instruction. The PDSA provides a systematic way for analyzing data and using the data to inform instruction. However, a collaborative community such as PLCs can help provide the support teachers may need when analyzing data.

Implications

Completing a study on perceptions of elementary school teachers about analyzing data to inform instruction will help to get a better understanding of how teachers feel about the use of the district's prescribed model for analyzing data and how the teachers are currently using the model in the classrooms to inform instruction. This study may help teachers and other educational leaders reflect on the school culture to ensure that their schools are using data more effectively to improve teaching and learning. Furthermore, the study may allow educators to see any deficiencies in their use of data that they can remedy, and provide teachers with the support needed to do so. By understanding the teachers' needs and levels of competency, leaders in education may identify and provide relevant resources as needed. Teachers may also gain personal insight about the level at which the teachers develop assessments and use the assessments to analyze data to direct and improve instructional strategies. District leaders may be able to recognize the strengths and limitations of the model that is currently in place and provide support for teachers where needed.

Administrators should examine PLCs and teacher capacity more closely to ensure that current and new teachers are able to use the district's prescribed model to analyze data to inform instruction in a standard way. Educators will look at PLCs in the local setting differently to ensure that the schoolteachers and leaders are responding to the schools' needs by learning from one another (Jessie, 2007). In addition, the project that I developed from the study may allow teachers and leaders to delve deeper into what a PLC should consist of and make improvements that will foster more teacher

collaboration. Depending on the outcome of the study, teachers may have the opportunity to engage in a 3-day professional development that may help improve the way the teachers use data in the classroom to improve instructional practices by participating in a training on how to use the district's PDSA. Improvement in instructional practices can lead to improvement in student learning. The tentative PD was designed to assist new, experienced, and future teachers with developing the skills needed to implement the PDSA in class. The PD consists of an overview of the PDSA to explain what PDSA is and why PDSA is used. The other part of the PD allows participants to analyze other PDSA displayed models to identify which ones have effective and ineffective components of the PDSA. During the last part of the PD, the teachers are offered a working session to develop their individual PDSA and to practice going through the process to become familiar with the components so that they may apply them in their individual classrooms.

Summary

The data, which informs instruction, derives from assessments. Many types of assessments serve different purposes and offer different opportunities for using data to improve student performance (Jennings, 2012). Formative assessments can provide teachers with data to help adjust instruction throughout a learning cycle. Benchmark assessments can measure students' progress toward a set of learning goals. Teachers give students mini-tests throughout the school year to give teachers timely feedback on student progression toward meeting academic standards (Henderson et al., 2007). Summative assessments provide critical data that teachers can use in conjunction with those above to

improve both teaching and learning. Moreover, teachers should use all data from

students' assessments to understand students' depth of knowledge, to check students'

progress toward proficiency, and to provide continued learning that is customized to each

student's needs (Pon, 2013). It is important for teachers to collaborate and use best

practices when using data from assessments to inform instruction. One way to collaborate

on data analysis is by creating a school culture in which the data practices are the same

for all educators. PLCs can provide the opportunity for data collaboration to take place.

The literature indicates that teachers should use data from assessments to

collaborate and make sense of it so that data can become actionable. Teachers should

work together and offer support on how to use the data to make changes to instructional

strategies so that student achievement improves. When PLCs are implemented, the school

culture is much different because teachers are no longer isolated with personal data.

Teachers are provided with the opportunity to learn from one another and have a shared

vision in which teachers collaborate, learn together, and take responsibility for student

learning. It is important for school leaders to be involved in the process of creating a

data-driven culture by building capacity and ensuring that PLCs are implemented in a

way that creates a data-driven culture that is focused on student learning and teacher

growth. PLCs should be a collaborative culture that is results-oriented and focused on

learning (DuFour, DuFour, Eaker, & Many, 2006). Teachers should work together to use

a system to analyze data from assessments to discover and address the needs of all

students. Section 2 will discuss the methodology of the study and will address the

research design and approach, criteria for selecting participants, data collection, and data analysis. Section 2 will also cover limitations.

Section 3 will describe the proposed project including rational, literature review, evaluation plan, and implication. Section 4 will discuss my reflections and conclusions including project strengths, limitations, recommendations, applications, future research, and conclusion.

Section 2: The Methodology

Introduction

This local project study was designed to explore teachers' perceptions and experiences about how they used and analyzed data to inform instruction. The purpose of this qualitative case study was to identify elementary- and middle-level teachers' perceptions about using the PDSA to analyze data in the classroom and using that data to inform classroom instruction. This study was focused on understanding a phenomenon and making meaning of a topic to see how other people interpret it (Merriam, 2009).

Research Design and Approach

The approach chosen for this investigation was a qualitative study. As suggested by Creswell (2012, 2013), qualitative research may be employed when a specific educational practice needs to be improved. Educators recognize the problems, then collect, analyze data, and consequently implement changes based on findings (Creswell, 2012, 2013). In addition, qualitative researchers focus on understanding the meaning, (Lodico, Spaulding, & Voegtle, 2010). I chose a qualitative study to explore the views of teachers and get a detailed understanding of the phenomenon. The phenomenon of this study was to explore the process teachers used to analyze data. The research design chosen for this study was a case study. A case study allowed me to conduct an in-depth exploration of a bounded system. In this study, the case was about teachers' use of data to inform instruction, and the bounded system for this study was the local district from which the participants were selected (see Creswell, 2012). There are three types of case studies: exploratory, explanatory, and descriptive (Yin, 2013). This study consisted of an

exploratory case study. I used interviews and document analysis to collect data. The interviews provided firsthand accounts by the participants about personal experiences (see Merriam, 2009). Documents may reveal clues about what organizational members who produce the materials think about their environment; researchers use the material to understand official perspectives on programs (Bogdan & Biklen, 2007). The information taken from the case study helped reveal rising themes that could help teachers advance in understanding how data analysis can help improve instruction.

Qualitative researchers should have defined research questions to have a central focus for data collection (Creswell, 2012). In addition, the research questions must be researchable or doable (Lodico et al., 2006). The following research questions assisted in deriving understanding and make meaning of the topic (see Merriam, 2009):

RQ1: What are elementary and middle school teachers' perceptions about utilizing the PDSA for analyzing data in the classroom?

RQ2: How do elementary and middle school teachers use assessment data to inform classroom instruction?

RQ3: What professional development support can help elementary and middle school teachers to utilize analyzed data to inform classroom instruction?

Justification of the Choice of Research Design

The research questions helped frame the study (Bogdan & Biklen, 2007) and develop interview questions. The interview questions allowed me to obtain more knowledge about the practices that teachers use to analyze data instead of providing the results of the teacher's efforts (see Lodico et al., 2006). The research questions helped me

conduct rich conversations with the participants about individual views (see Lodico et al., 2006). I developed a description of teachers' perceptions about using data to improve instruction through the answer to the interview questions.

I chose a case study design to answer the research questions and portray a detailed examination of a subject or event (Bogdan & Biklen, 2007; Creswell, 2012). Before I chose the case study design, I considered other qualitative approaches. Ethnography designs provide the researcher with rich descriptions as well, but I did not use it because it is used to focus on the culture-sharing behaviors; for this study, I gained an understanding of the activities of individual group members about a process instead of shared patterns (Creswell, 2012). Although I gained individual interpretation of personal experiences, the phenomenological design was not suitable for this study because the individuals did not interpret the same experiences (Lodico et al., 2006). Even though the school district has a prescribed model for all teachers to use when teachers collect and analyze data, teachers use various strategies and methods that are individualized and separate from colleagues; therefore, the perceptions and experiences will differ. The interviews allowed for a more open-ended process (Merriam, 2007) so that teachers could reflect on personal experiences. Grounded theory qualitative design was unacceptable because I did not use the data from this study to develop a theory (Lodico et al., 2006). Lastly, this study was not a narrative about the lives of teachers, so the narrative design is not appropriate (Creswell, 2012). After reviewing all the components of each of the qualitative designs, I concluded that I would conduct a case study in a natural setting and

be the primary instrument for collecting and analyzing the information (Lodico et al.,

2006).

<div align="center">**Participants**</div>

Criteria for Selecting Participants

Prior to recruiting any participants, I obtained approval (IRB # 09-13-17-

0191753) from the IRB to ensure the research design met the standards of Walden

University (Walden University IRB for Ethical Standards in Research, 2014). By

gathering informed consent from participants, I shared equitable research procedures,

minimized participants' risks, and demonstrated potential benefits of the research. I

applied to the IRB that outlined the project information, research questions, data

collection tools, data points yielded, data source, my plan for data analysis, potential

research participants, potential concerns, and the plan to share the findings of the study.

The following criteria helped guide identification of key informants for this study:

(a) must be certified school teachers of Grades 3-9 within the local district, (b) must be

familiar with the district's prescribed data analysis model (PDSA), and (c) must have at

least 3 years of teaching experience. The process and scope of the plan provided the IRB

with an explanation of how I collected and analyzed data and the methods that I used to

ensure confidentiality of participants.

<div align="center">**Setting and Sampling Technique**</div>

After receiving approval from the IRB, I started to identify participants. I used a

purposeful sampling method to select Grade 3-9 teachers employed by an elementary and

middle school in an urban school district in the Southern United States. This entire school

district has a student population of 803 students. Fifty-two teachers work in the district; 13 of the employed teachers work in the elementary level and teach Grades 3-6, and six teachers in the middle level teach Grades 7-9. The school district has three buildings; one building housed the elementary-grade levels for this study and a different building housed the middle-grade levels for this study. Each building has an assigned principal.

I used purposive sampling for this study based on the established criteria. As stated by Creswell (2012), "in purposeful sampling, researchers intentionally select individuals and sites to learn or understand the central phenomenon" (p. 206). I also used purposeful sampling to include people who know the most about a topic (Merriam, 2009). My goal was to obtain 8-10 teachers out of the 18 teachers as participants who could provide rich information to answer the research questions. Creswell (2013) suggested that 10-12 participants would allow a researcher to reach data saturation.

Procedures for Gaining Access to Participants

This qualitative project study required four levels of permission: Walden University IRB, the district superintendent, the building principals, and then teachers. To obtain permission to conduct the study and to gain access to participants, there are district and university procedures. Researchers should go through an approval process of a campus review board before studying individuals in a qualitative project (Creswell, 2012). I received approval from Walden University's IRB, and I received approval from the superintendent. I submitted all required forms to Walden IRB to apply to conduct my study. I got approval from all levels, including the superintendent and the two principals from each of the two school sites. I sent a letter of cooperation to the superintendent to

get approval because this is the protocol for the school district (see Appendix B). Once the Walden IRB granted me permission and approval to conduct the study, I sent a letter of cooperation to each of the two principals to obtain permissions to access the teachers on site prior to collecting any data (see Appendix C and D). As advised by Lodico et al. (2006), if a researcher selects participants from a specific institution, then written permission was needed from the principal or director (Lodico et al., 2006). However, if requested, I met with the district administrators to discuss the study. Upon my receiving approvals by the Walden IRB, the superintendent, and the principals, I checked to ensure that the teachers met the established criteria and secured the signed consent forms prior to any data collection from participants. The consent forms included the purpose of the project, the time needed for each data collection process, and an explanation of the way I intended to use the data collected. I obtained all e-mail addresses from the staff directory on the school website and/or the district e-mail database. I obtained informed consent from the teachers by doing the following:

1. Sent an e-mail to teachers (see Appendix E) explaining the study, requesting consideration, and sharing a copy of the informed consent.

2. Asked teachers who are interested in participating to respond by e-mail.

3. Eight teachers responded and were accepted as study participants.

4. The eight volunteers sent e-mails acknowledging consent and accepting the terms of the agreement.

Throughout the process, I was in minimum contact with the teachers and only contacted them to arrange times for the interviews, document analysis, and, if needed, for member checking.

Ethical Protection of Participants

Before beginning the interviews, I reminded all participants about ethical protections and confidentiality during this study. Researchers should not share any information that could reveal the participants' identities or study site (Bogdan & Biklen, 2007, p. 50). Ethical considerations have established the confidentiality of the data collected from the interviews and document analysis. Measures for ethical protection of participants include the following: (a) informing participants of the purpose of the study; (b) sharing information about the study with participants; (c) conducting meetings in a private, locked room; (d) respecting the thoughts and feedback of the participants; (e) using ethical interview practices; (f) maintaining confidentiality; (g) securing all data collected; and (h) collaborating with participants.

In addition, I guaranteed confidentiality by e-mailing invitation letters, by not discussing the study, and by keeping information coded with pseudonyms. I kept all information from the study confidential by storing them in a locked file cabinet in my home for a minimum of 5 years after the study was complete. This includes the hard copy of all documents, interview transcripts, journals, tape recordings, flash-drives, and any other storage devices used during the study. I used pseudonyms to protect the identity of the site and participants so that I would not reveal the names, professional roles, and contact information.

Methods for Establishing Researcher/Participant Relationship

Prior to conducting interviews, the participants and I agreed on the times and locations for the interviews so that the times and locations are convenient and appropriate for both parties. As advised by Creswell (2012), data collection should not interrupt instructional responsibilities. Therefore, I assured the participants that I would never disrupt class time for interviews or document analysis throughout the period of data collection. I provided the participants with my contact information prior to beginning the study so they could contact as needed throughout the duration of this study. In addition, I informed all the participants that all information collected was neither evaluative nor judgmental. I assured the participants that I would use the information strictly for providing information to address the research questions, and I will never disclose it to others. I used pseudonyms to record all data and to identify speakers within transcripts. I reminded the participants that I would never refer to real names when discussing the study. I also reminded participants only to share what the participants were comfortable with sharing their individual experiences about collecting and using data to inform instructional plans. Furthermore, I gave participants an opportunity to take a break when needed. I presented these conditions to increase participants' comfort levels during the individual interviews. My role as the researcher was limited to conducting document analysis and to asking questions with brief checks for understanding.

Data Collection

Upon receiving approval by the Walden University IRB, the district superintendent, the building principals, and informed consent from the teacher, I started

collecting data. After choosing which type of data would help answer the research questions (Creswell, 2012, p. 233), I conducted interviews and document analysis to obtain first-hand information about the experiences of teachers using the district prescribed data analysis model (Bogdan & Biklen, 2007).

Case studies are typically focused on individuals within a group or small groups in naturalistic settings to gather information from multiple sources and perspectives (Lodico et al., 2006). Researchers use case studies to explore in depth processes (Creswell, 2009). Because I sought to gather information by interviewing and observing teachers who use the data analysis model, a case study was the best choice to accomplish this study.

I collected the data for this qualitative study from a combination of two different sources to provide an in-depth understanding of the teachers' perceptions and experiences with using the prescribed model to analyze data to inform instruction. Multiple forms of data will increase evidence of credibility (Lodico et al., 2006). To provide the best data, I chose the following methods for collecting data: interviews and document analysis. I explain and discuss each data collection method below. This detailed explanation helped to ensure dependability (Lodico et al., 2006).

Interviews

I conducted individual teacher interviews so that the teachers could share thoughts comfortably and in confidence (see Creswell, 2012). I planned to conduct these interviews on scheduled dates during the participant's planning period. However, it was more appropriate to conduct the interviews after school hours. Interviews are typically

conversational and are used to gather descriptive data in the participants' own words so

that the researcher gathers insight how subjects interpret things (Bogdan & Biklen, 2007).

I scheduled in-person interviews with each participant, and I provided options for either

an e-mail or a telephone interview if a teacher has a scheduling conflict. A semistructured

interview sufficed, because it allowed me to prompt teachers' responses about individual

perceptions of how they use the district's prescribed data analysis model to inform

instruction; this also allowed the participants some flexibility when responding (Merriam,

2009). The interviews included open-ended questions (see Appendix F) so that the

participants could express perceptions and experiences without any outside influence, and

I used probing questions as needed for the participant to explain answers in more detail

(Creswell, 2012). To conduct the interviews, I located a room that was free from

distractions and one that could lock to protect the confidentiality of the participants. I

placed a sign on the door to assure that others are aware the room was in use. Before I

began the interview, I reminded each participant of the purpose of the study, the expected

time of 45-60 minutes for interviews, the planned use of the interview results, and the

availability of the study summary after the study. Additionally, I used a smart device

audio-voice recorder for each interview, and I transcribed each interview for later use in

collecting, collating, and coding data. An audiotape recording was vital because it

allowed me to preserve everything that was discussed for analysis (Merriam, 2009).

Moreover, the audiotape captured an accurate record of the conversations (Creswell,

2012).

I produced the interview questions (see Appendix F) based on the key concepts of the PDSA and I aligned the interview questions with the research questions. I aligned Questions 1-5 with RQ1, Questions 6-8 with RQ2, and Questions 9-11 with RQ3. I developed the interview questions from the process steps of the PDSA. These questions helped identify how teachers implement and use the PDSA steps. I aligned the interview questions carefully with the research questions so that the information gained from the participants aligned to the overall purpose of the study. Excellent interview questions are those that are typically open-ended and crafted around the topic being studied (Merriam, 2009). Open-ended questions provide participants with an opportunity to give in-depth answers and not just vague responses (Creswell, 2013). The questions that I designed for the study allowed participants the opportunity to expound on personal experiences with using the PDSA, but also to discuss the viewpoint on factors that cause the minimum use of the PDSA.

Research log and Reflective Journal

I recorded reflective notes during the interview to document visual observations such as facial expressions, gestures, and emphasized statements (Lodico et al., 2006). I established interview protocols (see Appendix F) to record information. "Data recording protocols are forms designed and used by qualitative researchers to record information during observations and interviews" (Creswell, 2012, p. 225). I maintained this data collection in a personal reflective journal. I collected clarifying notes in the journal during the interviews to capture additional visible information such as facial expressions, gestures, and voice tone. I also noted any strong statements or significant insights.

Document Analysis: Data Walls

In addition to the interviews, I observed the data walls used within each of the participants' classroom. Researchers can use physical objects found within the study setting as documents (Merriam, 2009). Therefore, the data walls were the primary documents analyzed in my study. If there were any scheduled e-mail or telephone interviews scheduled, I received permission to go to the site and take pictures of the participant's data wall prior to conducting an interview and document analysis questions so that I used it in place of the physical observation. The purpose of the document analysis approach was to focus on the teachers' representations of data walls and how the data walls connect to instructional activities. Document analysis provided data that I can cross-reference to the participants' responses to the interview questions. As mentioned by Merriam (2009; 2014), document analysis can provide researchers with firsthand evidence of human actions and efforts. Documents are also a primary source of data collection. Therefore, I used document analysis in addition to the interviews so that I could triangulate the emerging findings (Merriam, 2009). In addition, I used the document analysis to supplement some of the details about how teachers use the PDSA that the participants may not have discussed during the interview. The documents had several benefits; the documents (a) could be accessed at convenient times; (b) served as written evidence that does not have to be transcribed; (c) represented data that the participant has thought about and given attention to; and (d) did not alter the setting (Creswell, 2009).

I scheduled a time with each participant to visit his or her classrooms to observe. I made notations about their data walls, and I asked questions regarding the use of the walls during instructional periods. This data wall analysis provided me with the documentation needed to get firsthand information that showed what efforts the teachers put into using the data walls (Merriam, 2014). The document analysis served as a critical piece of evidence for the data collection process. I assured the participants that when I analyze the data walls, I would only focus on how they created their data walls and how the participants use the data walls during instruction.

During the scheduled meeting to observe each participant's data wall, I also asked four implementation questions. I allocated thirty minutes for this process. I used the Document Analysis Form (see Appendix G) to collect information that responds to the research questions. Through the document analysis, I observed how teachers use the data wall, and the document analysis provided me with the substance to ask questions about practices. Researchers consider documents as research tools that the researcher may generate for investigation (Merriam, 2009). I could see if the teachers post state, benchmark, and classroom assessment data. I asked questions about how teachers present the data during instruction, and I explored how teachers engage students to use the data walls to self-evaluate and to set goals. I produced this Document Analysis Form (see Appendix G), and it aligns with the PSDA plan. It contains three columns. The first one listed the parts of PDSA process that the teacher should on the data wall. The second column was for checking off evidence of the parts posted, and the third was for writing notes about PDSA activities displayed on the data wall. The bottom part of the

observation report was for collecting reflective notes in which I recorded my personal thoughts during the observation.

I aligned the information in column one of the Classroom Observation Form with a booklet entitled *Continuous Classroom Improvement: First Steps in Using a System Approach to Improve Learning Results* (Jim Shipley & Associates, 2012). All teachers who were in the district four years ago after the teachers attended a continuous improvement workshop with Jim Shipley & Associates received a booklet. The district provided and presented this workshop to teachers about four years ago. The purpose of the workshop was to learn what it takes to implement the initial sections of a procedural approach to continuous improvement as the most effective way to improve classroom-learning results (Jim Shipley & Associates, 2012). This booklet represents one of the best sources for observing how teachers use PDSA. It was a guide for how data walls should be set-up in the district. The guide contains templates for all parts of the PDSA; this information was helpful in scripting interview questions 2, 3, and 4. The guide also has samples of high-yield instructional strategies, which was useful in developing interview questions 7, 8, and 9.

Prior to conducting the data wall document analysis, I informed the participants that I was not evaluating or judging the walls, as I am not qualified to do so. I collected information about how participants have created the data wall displays and how the teachers use them as instructional tools. I have no supervisory role over the participants. My role was a non-participant observer, so I viewed and recorded notes about the data wall (Creswell, 2012).

Role of the Researcher

Once I obtained a signed consent from participants or an e-mail that indicated

consent, I started the data collection process. For participants who provided a signed copy

of the informed consent agreement, I provided them with a copy of the signed form. My

role in this qualitative study is the primary data collection instrument. Merriam (2016)

shared that qualitative researchers serve as an instrumental agent when collecting data.

Therefore, I collected, analyzed, interpreted, and reported findings related to the research

problem. However, I am also an employee of this school district, and I am a teacher at the

elementary school site. I have no supervisory role over the teachers. I have ten years

teaching experience as a science teacher; I have been a middle-level science teacher in

this district for five years. I taught at the middle school site in the past for four years, and

this was my first-year teaching at the elementary school in which I am currently an

employee. As a teacher in the district, I have never worked with elementary teachers until

this year so there are no pre-established relationships. However, I do have prior

knowledge of the prescribed data analysis model, but I was cautious not impose my

personal thoughts, bias, and preconceived ideas on the interviewee. The probing

questions allowed the participants to share thoughts during the interview. I also remained

focused during the interview conversation, and I maintained a relaxed tone. As

recommended by Costa and Garston (2002), it was important to remain relaxed, use very

few nonverbal cues, and keep eye contact to focus a conversation. I used a personal

reflection log to record my personal answers to the interview questions before I started

collecting data from the participants. This allowed me to record my own thinking,

feelings, and perceptions throughout the research process. I also used this reflection log to respond to the interview questions before I started collecting data; this allowed me to disclose fully my responses and opinions. As I conduct this study, I assured the participants that I was not evaluating at any time and that the focus of the data collection was to examine the process the teachers go through when using the PDSA when analyzing data to inform instruction.

Data Analysis Process

By organizing and participating in ongoing data analysis, I recognized the necessity of maintaining focus and structure to the data collected. To keep track of all data and emerging understandings, I started the analysis process during data collection (Merriam, 2009). Creswell (2009) advised that researchers should gather data in a systematic way to discover emerging themes and make sense of what has been collected. The researcher should collect data, prepare data for analysis by transcribing, critically read the transcribed material, and then assign codes by labeling (Creswell, 2012). Creswell (2012) also identified six ways to analyze and interpret the qualitative data: (a) preparing and organizing data; (b) exploring the data by coding; (c) using the code to produce broad categories (themes); (d) representing and reporting findings through narratives and visuals; (e) interpreting the meaning of the results; and (f) conducting strategies to validate the findings.

Data Analysis: Interviews

Once I conducted each interview, I listened to the audio-recorded transcript and transcribed it using Microsoft Word. I waited a week and listened to the interview

recording again, to really listen for participant perceptions and make any corrections

needed in the transcriptions. Because exploring data and developing codes was the first

step of the analysis, I read the transcript from the first interview in its entirety and coded

for responses related to the RQs for this study. I used the process of open coding to

highlight initial responses to research questions (Creswell, 2009; Creswell, 2012). Next, I

read and commented on the data by creating memos in my reflection journal and along

the right margins of the transcript so that I could capture tentative themes, categories, and

explanations. I also noted questions in my reflection journal that I wanted to look for in

the document analysis.

I analyzed the data using inductive and comparative coding to identify patterns,

themes, descriptions, and to examine the phenomena that may occur in the data (Yin,

2014). "Coding is the process of segmenting and labeling text to form descriptions and

broad themes in the data" (Creswell, 2012, p. 243).

I used an open coding process to make sense of the data by labeling segments so

that I could identify patterns and themes from the participants' perspective and then

collapsed the codes into broad themes based on redundancy. This process involves the

following: (a) identifying text segments, (b) placing a bracket around the text segment,

and (c) assigning a code word or phrase to describe accurately the meaning of that part of

the text. These text segments are sentences or phrases that relate to a single code

(Creswell, 2012). A basic way for analyzing qualitative data is through constant

comparative methods that are inductive (Merriam, 2009). Because I compared data from

several participants, I used the same colors to highlight words from the transcript that

related to each research question. I highlighted any words or phrases that are relevant to RQ1 in pink, RQ2 in green, and RQ3 in orange. I looked for similar wording from the different participants and placed a box around them to form codes and themes, which I recorded in the margins using an organizational structure suggested by Creswell (2012).

Data Analysis: Document Analysis Data Walls

By examining and comparing the transcripts and notes, I coded and recoded as necessary. I repeated this same process when going through notes from the data wall, document analysis and compared it to the notes from the document analysis of other participants (Creswell, 2012). I used wording from verbatim statements that I recorded when asking questions during the data wall, document analysis to come up with codes and themes. I identified, examined, and interpreted patterns that emerged from the data and determined patterns and themes related to the research questions (Lodico et al., 2010). I did this by taking the coded data from the interviews and document analysis and I used the same colors to highlight information based on research questions. Once I coded each data source and assigned broad themes, I underlined similarities to narrow my list of themes and then organize the components as headings in a table. Qualitative researchers may represent findings using tables. The headings in the table will be as follows: (a) research questions, (b) themes, and (c) findings. Capturing the patterns that emerged from the coded data helped to reveal perceptions and experiences of participants using the prescribed data analysis system.

Research Accuracy and Credibility

The processes and methods used to conduct a study can easily define the quality

of the research (Merriam, 2009). A major component of ensuring the quality of research

is the accuracy of reported findings. Gay, Mills, and Airasian (2012) explained that as a

researcher, one must consider the complexities of the study and be able to explain the

problem. In addition to that, a researcher must include as much detail as possible so that

the readers will be able to develop a picture for themselves; this will help with

transferability (Gay et al., 2012). I interviewed participants and conducted a document

analysis of the participants' data walls.

Lodico et al. (2010) stated that researchers often use multiple data collection

methods to substantiate results. In addition, researchers must check the accuracy and

credibility of these data collection methods. I used recording and member checking to

help secure the credibility, transferability, and confirmability of my findings. The

trustworthiness of a qualitative research study is determined by its credibility and

transferability. To establish credibility, I captured what the participants believed,

experienced, and perceived through member checking. Member checking is the act of

forwarding transcribed interviews, findings, or summaries to participants for the

participant's review to ensure that the researcher's biases toward responses were not

prejudiced by (Lodico et al., 2010). To determine transferability, I will include rich

descriptions and specific details about the context of the participants' responses. The

reflexivity of my thoughts during the coding process will strengthen confirmability.

Saldana (2008) felt that because qualitative inquiries mandate painstaking thoughtfulness

to participant responses and profound contemplation of evolving patterns and themes, repeated recoding is necessary. Recoding is the process of refining coding as the researcher review the data and initial coding with a new perception (Saldana, 2008).

Creswell (2012) stated that member checking was one way to certify participants' interpretation of an experience. Member checking is an act of seeking participant response to your initial findings (Merriam & Tisdell 2015). I gave each of my participants a copy of my interview findings, which gave the participants the opportunity to verify or correct any misunderstandings pertaining to personal responses before I started to analyze, seek patterns, and identify themes. According to Merriam and Tisdell (2015), member checks are important because member checks request participants to remark on my analysis of the participants' experiences. Giving my initial findings to the participant to evaluate accuracy and credibility was the process of member checking (Creswell, 2012). Member checking provided me with the chance to corroborate participant perspectives and help minimize inaccurate findings. Lodico et al. (2010) explained that participants' perceptions of own experiences complement the researcher's interpretation of those same experiences, thereby producing a credible study.

Yin (2011) stated that researchers establish credibility through the transparency of how researchers present procedures and data. Lodico et al. (2010) also stated that researchers can base transferability on how well the researcher describes the narrative of the study. According to Morse (2015), transferability involves the inclusion of thick, rich description of data collected from an appropriate sample size. To establish my study's credibility, I included a description of interview responses, member checks, and my notes

from observing data walls and gathering information about each participant's process of use. According to Lodico et al. (2010), research can support credibility by evidence of spending extended amounts of time with participants of the study and providing summaries of initial findings for participants' reviews. To demonstrate transferability, I reported the findings by thoroughly describing them within the contexts of the participants' work experiences, perceptions, and instructional practices. I also confirmed the objectivity of the data and the findings by presenting and explaining my code process. By exploring and interpreting the data in different ways, I enhanced the trustworthiness of the findings using various approaches (Merriam, 2014). I also clarified my biases by describing how my background could shape the analysis of the data. Finally, I shared the research results in a 1-2-page summary with the participants, principal, and the members of the district administration.

Discrepant Cases

I searched for and identified discrepant cases in the data. Discrepant cases exist when there are contradictory or disconfirming data that provide alternative perspectives within the study. I used the data collected from interviews and document analysis to identify themes and discover findings. I examined the data carefully, and I discovered alternative explanations or stand-alone findings that will not fit in the main themes; I noted these as discrepant cases (Merriam, 2009). If this happened, I looked at the discrepant case in full detail, addressed it during member checking to see if it can fit into a broad theme and if not, it was noted and reported as discrepant, but coded and categorized (alone) as well. I mitigated any potential discrepancies by maintaining

consistent data recording and interpreting processes. I noted and shared all discrepant actions and findings.

Conclusion

This qualitative study used a case study design to gather data to address the problem of elementary and middle-level teachers in a rural school district in the Southern United States, who are not able to monitor effectively student academic progress using PDSA, which was a district prescribed model. I selected participants using a purposeful sampling of teachers from Grades 3–9 who are familiar with the district prescribed PDSA. I used two data collection methods to draw rich, detailed data to inform my problem and research questions; additionally, I kept a researcher log for document analysis and personal reflections. My data collection methods were one on one interviews and document analysis of data walls. I used open coding in the data analysis to identify themes and trends. To ensure data reliability and validity, I established credibility, transferability, and trustworthiness of data through the data analysis processes

Data Analysis Results

Data Analysis Process

Researchers use qualitative data analysis to identify any patterns and themes that may help to answer research questions (Lodico et al., 2010). I collected data through interviews and document analysis; I chose both methods because they aligned with the research questions (Merriam, 2014). Several sources of data were used to show the big picture, so the study would be more convincing (Yin, 2013). I explored the data in different ways, and I interpreted in various ways because this enhanced the

trustworthiness of the findings (Merriam, 2014). I collected and then analyzed all the data

and made sense of the phenomena to understand the participants' meaning of it (Merriam,

2014). While completing the data collection, I simultaneously started organizing the data

for analysis. Keeping the data organized allowed me to keep track of emerging

understandings and bring focus. Although in the beginning, it seemed a little challenging.

As I collected more data from different participants and prepared the data for analysis,

the process seemed to become more structured, and I could make sense of the collected

data. Then I used the six steps identified by Creswell (2012) to analyze and interpret the

qualitative data. I prepared and organized the data, I coded the data, I developed themes

from the identified codes, and I analyzed the themes to uncover the findings. Before I

started the open coding process, I organized the data by listening and re-listening to the

audio-recorded interviews. I listened to the recording one week and let a week pass by

before listening to the same recording again. As I listened the second time it allowed me

to get a better understanding of each participant's perceptions, and I could make

corrections to transcripts as needed. I jotted down preliminary words associated with

research questions as I transcribed the recorded interviews and wrote field notes (Saluda,

2015).

I read the completed transcripts all the way through to the end. Once I was done, I

started the open coding process by coding and re-coding to identify themes that came

from the interviews and document analysis data (Creswell, 2012). I followed the open

coding process by highlighting any words or phrases that could answer the each of the

RQs (Creswell, 2009; Creswell, 2012). After highlighting answers to the research

questions, I placed brackets around synonyms or similar phrases as I looked for patterns

throughout each transcription for the same research question, paying close attention to the

redundancy of different participants. Next, I wrote notes of tentative themes and

categories in the right margin. This is an organized structure recommended by Creswell

(2012). I, then, repeated the same process with the field notes from my document analysis

by constantly comparing and using the same color highlighter for similarities. I

highlighted any words or phrases that were relevant to RQ1 in pink, RQ2 in green, and

RQ3 in orange for all data sources. Finally, I took the coded data and organized it into

themes that could produce possible findings. As suggested by Merriam (2009), the

ultimate purpose of coding data is to capture emerging themes that are constant

throughout the collected data.

I used a table as a visual representation to organize the repetitive phrases, themes,

and findings of teachers' perceptions about using and analyzing data to inform

instruction. The themes on the table showed the participants' perceptions that emerged

from their experiences, challenges, and successes with using and analyzing data to inform

instruction. By carefully analyzing the data, I formed a visual of professional experiences

and deep thoughts of elementary/middle-level teachers by capturing their voice about

using PDSA in the classroom to inform instruction. The data developed from patterns that

frequently appeared in the thematically coded transcripts and field notes.

I continuously checked credibility and trustworthiness throughout the analysis

process. Merriam (2014) expressed that member checking can help to increase the

trustworthiness of findings. Therefore, I shared my initial findings with participants to

gather their feedback of any misunderstanding, to verify the results, and to minimize

inaccuracies. Sharing initial findings was part of member checking that allowed

participants to evaluate accuracy and credibility (Creswell, 2012). I verified the data that

I collected by using triangulation to compare data sources (interviews and document

analysis) against each other. The interviews provided individual teacher perception about

how teachers use and analyze data to inform instruction; document analysis provided

information about how teachers use data walls to inform their instruction. Different

methods of collecting data allowed me to gather thick, rich, and detailed descriptions to

provide readers with sufficient information for them to understand clearly the shared

information (Merriam, 2014). Rich details also helped to establish transferability (Morse,

2015). To analyze the data I collected, I reviewed field notes from each interview and

document analysis to identify the patterns and themes related to each interview question.

I read and re-read the text until categories of themes emerged (Merriam, 2014). Once I

collected all the data, I compiled the interview transcripts and the document field notes to

identify patterns and themes, and organized it on another sheet of paper and color-coded

it to find a visual way to identify the findings. I coded and re-coded throughout the

analysis process, and then I used member check to check the accuracy of the information.

According to Lodico et al. (2010), researchers must check the accuracy and credibility of

all data collection methods. I used re-coding and member checking to help secure the

credibility and transferability of my findings. The member checking process also helped

to verify the information obtained from the interviews. Member checking allowed me to

establish credibility, by capturing the participants' beliefs, experiences, and perceptions.

Member checking is the act of forwarding transcribed interviews, findings, or summaries

to participants for the participants to review and to ensure that there were no prejudice

responses by the researcher's biases (Lodico et al., 2010). I provided copies of my

projected findings to each participant and asked each participant to review the findings to

ensure that I captured their perceptions accurately (Creswell, 2012). I gave the

participants the opportunity to discuss the findings with me. By sharing the findings with

the participants and allowing the participants, time to analyze and comment on the

findings, I decreased the chances of interpreting incorrect data (Creswell, 2012). Member

checking allowed me to ensure that the participants recognize themselves in the findings

and ensure that I gave them an opportunity to provide feedback about the initial findings

(Merriam, 2009).

I triangulated the data from the interviews and the document analysis. I compared

the information gained from the two sources of data to get a better perspective about the

collected data. I interviewed the participants to gather their perception and experiences

about using the prescribed data analysis system, PDSA, to inform instruction and then I

observed the same participants' data walls to see how they use PDSA in their classrooms.

By comparing a variety of data sources, I could cross check the information and make the

findings more convincing and authentic (Yin, 2013). I interviewed seven teachers and

gathered several perspectives.

I could improve the validity of the data collected by dealing with any discrepant

data that did not fit in dominant themes and patterns. If there had been any discrepant

cases, I would have examined them in more detail to determine why they differed, and

note the stand-alone findings as a discrepant case. In addition, I would code and

categorize the discrepant case alone. There were no apparent discrepant cases noted

during the data collection and member checking process.

Findings

In this section, I will share the patterns and themes that emerged from my data

collection. As I completed my data analysis, I identified, examined, and interpreted the

patterns and themes that emerged from the data. This process gave me the opportunity to

see how the patterns and themes helped to answer my research question (Lodico et al.,

2010). I discovered five themes that emerged from RQ1, four themes emerged from RQ

2, and four themes emerged from RQ3. I identified three findings from the 13 themes that

responded to the three research questions and the problem that prompted this study.

Below I discuss each of the findings and provide examples to support the findings from

the data I collected. I used pseudonyms refer to the participants as I shared their

perceptions and views.

The problem that prompted this study was elementary and middle school teachers

in a rural school district in the Southern United States are not able to monitor effectively

student academic progress using PDSA, a district prescribed data-driven model. The

teachers have a prescribed model, known as the PDSA, to use data to inform instruction

and to analyze data in the classroom. There is a gap in practice between district

administrators' expectations of teachers' implementation of data use and the competency

levels of teachers to perform this task. Although the teachers attempted to use the PDSA,

the teachers did not routinely implement the model. Additionally, a goal of this study was

to determine support needed for elementary and middle school teachers to use the PDSA. Therefore, the research questions focused on elementary and middle-level teachers' perceptions about using the PDSA for analyzing data, methods teachers used assessments to inform instruction, and professional development needs. The research questions formed the basis for the interview (Appendix F) and document analysis (Appendix G).

In this study, I addressed the following research questions:

RQ1: What are elementary and middle school teachers' perceptions about utilizing the PDSA for analyzing data in the classroom?

RQ2: How do elementary and middle school teachers use assessment data to inform classroom instruction?

RQ3: What professional development support can help elementary and middle school teachers to utilize analyzed data to inform classroom instruction?

The themes that emerged from the data responded to both the research questions and the problem that prompted the study. I began by searching transcribed interviews, field notes, and my research journal for relevant data such as repeating words and phrases, similarities, and differences. I took repeated words from the participants' interviews; some of the repeated phrases included, *review do again re-teach*; participants used these similar phrases 35 times throughout the interviews. Participants also repeatedly used other similar terms such as *differentiate instruction*, *tailor instruction*, and *adjust instruction*, 20 times. The participants used the term *collaboration* 10 times. I grouped the repeated words and phrases into common themes to help form the findings. I reviewed the findings by continuously reading the text from the interviews and document

analysis until the groups of themes emerged. This process resulted in 13 themes that

addressed the three research questions. I identified five themes that emerged from RQ1;

four themes emerged from RQ2, and five themes from RQ3. I then matched up each of

the 13 themes with the related research question. Next, I gathered all the information to

list the research questions, themes, and findings, which are described in Table 1.

Table 1

Perceptions of Teachers about Using and Analyzing Data to Inform Instruction

Research Questions	Themes	Findings
RQ1. What are elementary and middle school teachers' perceptions about utilizing the PDSA for analyzing data in the classroom?	Elementary/ Middle-level teachers recognize that the PDSA is important for determining students' prior knowledge in the beginning and creating individual learning plans to meet objectives.	Teachers acknowledge that using the PDSA for analyzing data is time-consuming, but it is an effective model to identify learning goals and plan future instruction.
	Elementary/ Middle-level teachers recognize that the PDSA is useful to establish and understand learning objectives and learning targets.	
	Elementary/ Middle-level teachers believe that the PDSA is beneficial for teachers to pre-assess students before planning lessons and tailoring instruction.	
	Elementary/ Middle-level teachers recognize that the PDSA is a good model to use in order to adjust lessons.	
	Elementary/ Middle-level teachers expressed that lack of time is one challenge of using the PDSA to analyze data.	.
RQ2. How do elementary and middle school teachers use assessment data to inform classroom instruction?	Elementary/ Middle-level teachers use assessment data to re-teach, review, and re-test.	Teachers rely on assessment data to teach, re-teach and differentiate instruction to address the needs of all students.
	Elementary/ Middle-level teachers use assessment data to group students in different tiers and mixed ability groups.	
	Elementary/ Middle-level teachers use assessment data to focus instructional strategies.	
	Elementary/ Middle-level teachers use assessment data to identify students' weaknesses and strengths.	

Research Questions	Themes	Findings
RQ3. What can professional development support help elementary and middle school teachers to utilize analyzed data to inform classroom instruction?	Elementary/Middle-level teachers want to have an on-going collaboration with other teachers and administrators about using data to analyze classroom instruction. New teachers should receive training on PDSA. All teachers should have on-going refresher workshops on PDSA. All teachers need school-wide training in data analysis.	Teachers would like to engage in initial training and on-going, collaborative workshops on using the PDSA to analyze data.

Finding 1: PDSA is an Effective Model to Identify Learning Goals and to Plan Instruction.

The first finding revealed that elementary and middle-level teachers acknowledge that using the PDSA for analyzing data is time-consuming, but it is an effective model to identify learning goals and plan future instruction. The participants in the study agreed that the PDSA is an effective, but time-consuming, model. Most participants in the study also agreed that it can be used to identify learning goals and plan instruction. During the interviews, Teacher 1 stated, "The cycle, it's pretty good…it takes a lot of preparation to make sure you have all of your steps together and all the materials together, but the cycle to me is not strenuous at all". In addition, Teacher 1 said, "My biggest obstacle, especially when I started, was if I was going to do it weekly, bi-weekly or whether I would do it as a unit because it's so time-consuming". Teacher 1 shared that the PDSA holds teachers accountable and helps them to do some things differently to improve the way they teach. When I observed Teacher 1's data wall, the learning goals were posted, and we discussed the learning goals. Teacher 1 mentioned the following:

I will have it written on the board. I'll introduce it to the kids and say our objective or learning target for the week. Then, I will model the concept to give the students an idea of what we are going to be learning.

Teacher 2 said, "Personally, I feel that the PDSA is an excellent framework that can be used for continuous improvement and student learning. It is structured in a manner to prepare every student at each level of academic success". During the interview, Teacher 2 also added one obstacle within PDSA "is that it is difficult to be creative while being conscientious about time management." Teacher 2 also expressed that "the PDSA system will aid teachers in perfecting their craft, which in turn, will enhance student performance". During the data wall, document analysis, Teacher 2 had learning targets posted on the bulletin board and shared that "with the data wall I try to change out the target on a weekly basis". Teacher 2 also added, "I basically go over the learning targets orally at the onset of the instructional lesson and then I post the learning targets on the bulletin board for continual view by the students".

Teacher 8 indicated that the PDSA was a way to hold teachers accountable and monitor student progress toward learning goals. Teacher 5 said the following:

It keeps us on track with our students' progress, and it helps you to see where you're going. It's like a map that you might use to help students achieve and master the standards; the PDSA helps you see how far you are away from mastery.

Teacher 3 suggested that the PDSA is worth implementing in class even with limitations. Teacher 3 stated,

It's effective, and anything that's effective is worthwhile implementing in the

classroom. So, my feeling about implementing it is good. It works, and even with

the limitations, it works because you are constantly involving students, but you

are also constantly assessing as you go, so it helps with formative assessments.

Teacher 3 also added information to show that the PDSA was used to target learning

goals. Teacher 3 stated, "Anything to see where they are and where they need to be,

that's always an effective strategy". They also said that it "could be time-consuming, but

the process is good. It's effective; it involves the students, but overall one of the

limitations is the whole time it takes to address everything". Later, in the interview,

Teacher 3 also mentioned the following:

I think the number one obstacle is time; because you know as a classroom teacher,

you have standards to cover; you have a pacing guide to follow; and sometimes

even though you do your best to help the students to get it the first time, they

don't always. So, going back through the PDSA can interfere with the time that

you need to move on and cover whatever you need to cover. I think time would be

the biggest limitation when it comes to PDSA.

During the final stage of the interview, one of Teacher 3's statement was "So personally,

even though I keep coming back to the whole issue of time; that is a real issue. Even

though time is a factor, the PDSA is still effective". In addition, Teacher 3's final

statement was "it works, it's effective, and it sort of gets everybody on the same page.

Also, when the students see that everybody is using this, they're okay with it, they're

comfortable with it". Teacher 3's wall showed that the PDSA was being actively used.

When we discussed the posted Learning Target, Teacher 3 made the following statement:

> During instruction, I always make reference one, to the standards, because that's
> where the learning targets come from; we look at the standards and then each
> child, of course, would have a smart goal or whatever they hope to achieve.
> Whatever percentage score they expect to get from whatever, whether it's a unit
> test or the overall grade for the quarter. Whatever target they set we would
> constantly refer to it.

Another participant shared how she used PDSA to identify goals in her class.

Teacher 4 said, "with the Plan, Do, Study, Act, I meet with the students after a test to

look at the objectives that they missed and then I will also have a student tutor meet with

them in small groups". Teacher 4 also referred time as a factor while discussing obstacles

about the use of the PDSA. Teacher 4 stated, "in the beginning, I mean, time is always a

factor because we just don't have enough time, not even enough teaching time". She also

suggested that students are motivated when they know what to expect, so setting goals

are important. Teacher 4 said, "You tell your students, I expect you to make 90 percent,

and most of them will try to make 90 percent, or they will say I didn't make it this time

but next time I will". Teacher 4 added:

> I feel confident about using the PDSA but you know when you go around the
> whole PDSA cycle, that stuff is kind of time-consuming, but I do it, and
> sometimes it won't be in a circle, it might be in a line or on a pie chart, it's not
> always that circular, Plan, Do, Study, Act.

Based on my interviews, the teachers perceive the PDSA as an effective way to monitor student progress toward learning continuously. They agreed that it requires a lot of time to go through the PDSA cycle, but it is still worth using in their classrooms. The effectiveness of the model and limited time emerged repeatedly throughout the interviews. The document analysis consistently showed that teachers were using their data walls to identify and discuss learning targets with students so that they can move forward with instruction. I noted that all teachers had learning goals posted on their data walls. The participants all also had standards and objectives posted on their data walls as part of their Plan. Teacher 1 explained how they discussed the learning targets by stating the following:

> I just let them know and say that's our plan, that's what we want to accomplish, so that's how I do it. I just let them know, and if they have questions, I accommodate that and sometimes I even write it to make sure they all understand what the objective is and I ask is everybody okay with that, do you understand what we need to do, and once they say yeah then we move on.

During the document analysis questionnaire another participant, Teacher 2 said, "I basically go over what the teacher will do and what the students will do with the teacher". When I observed the data wall, I could see a bulleted list to show what the teacher and student will do. The statement from the interview and the evidence from the data wall observation indicated that the teachers use the PDSA to plan future instruction also.

The first finding in this study suggested that teachers in this study believe that the PDSA is very effective, but going through the cycle takes a lot of time to go through the

cycle. Most teachers believed that using the PDSA helps teachers provide structure by setting learning goals with students. Allowing students to set learning goals is supported by Abrams et al. (2016) and Mandinach (2012), who suggested as good practice for instructional improvement, teachers should allow students to be involved with setting learning goals. Teachers believed that the data provided through the PDSA helps bring structure to the lessons as in class. March et al. (2015) also believed that when data is posted and shared with student it helps to establish learning goals and bring focus to the lesson

Finding 2: Teachers Rely on Assessment Data to Teach, Re-teach, and Differentiate Instruction

The second finding revealed that teachers rely on assessment data to teach, re-teach, and differentiate instruction to address the needs of all students. Study participants agreed that assessments help them to see where students are and to determine if they need to go back and re-teach the material to help the students. During the interview, I asked Teacher 3, "How are data from assessments used to determine teaching strategies?" Teacher 3 said, "The data sort of let me know where the students are and that further drives me to come up with ways to help them get the material". Teacher 3 also said, "you can group students as to where they fall in the data". Teacher 3 went on to explain in more details what the goals are for all students, "Now for me, 80 percent was a benchmark for my students and any students who fell below that; that was an automatic re-take of the assessment". During the document analysis, I saw Teacher 3's class graph posted, and it coincided with what was stated in the interview. The Study part of PDSA

showed a graph of the classroom assessments; the x-axis showed the name of the assessment and the y-axis showed the number of students who scored 80 or above. The most recent assessment was shaded to 10 out of 21 students. Teacher 5 pointed to it and said, "This would be an example of a lesson that I will re-teach in a mini-lesson and have the 11 students who scored below 80 re-take the test". Teacher 5 also went on to say, "I may have to switch up my teaching strategies the second time".

Teacher 1 stated, "I'll just go back over what was missed on the assessment and that will tell me either, I didn't teach it correctly or I didn't teach it well enough". Teacher 5 said:

I give a test midway in the quarter to see if they have grasp whatever concepts I have taught, and if I realize that most of the students have not got it, then I know I need to re-teach the whole class.

Participants in the study also agreed that they use assessment data to differentiate instruction. As expressed by Teacher 6,

Assessment data determines what type of grouping you do in our classroom and whether you need to whole teach the students again or small group teaches the standard. Based on the data, I would determine the different tiers and differentiate instruction.

Teacher 7 said,

It depends on the weaknesses, if they're not meeting the goals that we have set, we must go back to the drawing board and change something. Whether it is the

teaching style, whether it's the activities, whether it's the dynamics of the

classroom, maybe rearrange group or something.

In addition, when discussing how teachers use assessment data to determine teaching

strategies, Teacher 5 said,

If half of the students have not got it then maybe I need to find a way to

differentiate so that the half that got it, they can move on and get mastery in these

skills while I'm doing one on one instruction or small groups.

During the document analysis questionnaire participants also established that students

engage in helping them determine teaching strategies after reviewing assessment data. As

Teacher 4stated:

We discuss the results; we look at what went wrong, why didn't we achieve the

goal and then we go back to see what we can make-up and of course I allow them

to retake after we have done the reviews and the mini-lessons.

Finding 2 showed that study participants all demonstrated a pattern of revisiting

their assessment data and their initial plans to determine the next best instructional steps

to take as they enter a new learning cycle. Next steps included whether teachers should

re-teach, differentiate instruction, or plan to teach new skills. According to Murawaski

and Lochner (2017) when teachers arrive back at the plan, it gives them a way to act so

that they will get the results they want to students to achieve. Most participants shared

that they go over results from assessments and return to the goals set at the beginning of

the lesson to make necessary changes to the way they deliver instruction during the next

learning cycle.

Finding 3: Teachers who use the PDSA Require On-going, Collaborative Workshops

The third finding revealed that teachers would like to engage in initial training and on-going, collaborative workshops on using the PDSA to analyze data. Participants agreed that all teachers need training, especially new teachers on how to use the PDSA. Teacher 3 stated during the interview, "there should be data workshops where teachers delve into data and then after all the training, you constantly need to be referring to the data as you go along the school year, not just one meeting". Teacher 3 also believed that "the administrators need to be trained on the whole process of data analysis so that they are able to articulate that to the staff". Teacher 3 said, "it should not just be one training, one meeting, but constant reference to the data".

Similarly, Teacher 1 stated the following:

> Initially, the PDSA needs to be done by grade or content level because it looks different on each level. But I think after the initial introducing what the model is all about; you need to get with your content area and make sure that everybody understands and continue to follow-up.

Teacher 7 reinforced this when by answering,

> Get two or three people from a department together, within a system, because only people within a system know what's best for those children, but within that department or grade level, we should all be working hard at the same time and on the same things. The only way we can do that is if we get together and plan. Then you don't have to pay these people all this money, of course, that's all they want.

I remember about eight years ago we had our learning community with common

goals and that was the best professional development I ever had, it changed me. I

thought it was excellent and anybody can do it the missionaries in the church can

do it, nurse on the floor can do it, anybody can do *Plan, Do*, *Study*, *Act*.

Although another participant, Teacher 6 agreed that there needs to be a training on the

PDSA. However, Teacher 6 recommended that an outside source come in to do the

training. During the interview, Teacher 6 suggested the following:

There should be a professional development that entails how to construct and

implement the PDSA board. A lot of us simply placing up the boards for the

district purposes, but we don't know what the true reason for the board. So, I

think the district should reach out to an outside source and bring people in who

can teach us how to use the PDSA board because I am pretty sure it would help

us, we just need to learn how to do it.

Teacher 2 made a similar statement during the interview. They stated, "Without proper

training new teachers would have limited capability on how to successfully implement

the PDSA". Teacher 2 added, "Teachers may not be able to effectively interpret data to

make proper adjustments to instruction if they are not trained properly". Lastly, Teacher

2 stated, "there should be a school-wide training and on-going collaboration between

school administrators, teachers, and the district level administrators".

Additionally, when I asked Teacher 1 if they thought other teachers needed to

have a training on the PDSA, Teacher 1 said, "Most definitely. This is particularly true

for new teachers and those who have only been in the district for a year or so because

they may not feel comfortable or don't even have it down pat yet". Later in the interview, Teacher 1 added, "We should be looking at where we are and where we need to be as a school and not looking at the data alone". When asked the same question, Teacher 5 responded, "Yes, because I see it as a vital component in monitoring progress and a personal way of ensuring we're going where we need to go".

During the interview, Teacher 7 suggested that the best workshop for a group of people is to continue the workshop yourself after the initial training by an outside source. Teacher 7 indicated that the district should not have other people constantly come into the district to train on the same concept. Teacher 7 also said, "Plan, Do, Study, Act is a system; not a classroom. It's a system. Wouldn't it be nice to walk down the hall and see all the teachers doing the same thing, and the students will know that we are invested?"

The third finding revealed that all participants felt there is a need for training on the PDSA because it is an effective model for increasing student achievement. The teachers suggested that the training take place in a collaborative environment. The teachers' suggestions are aligned to DuFour's (2004b) belief that teachers recognize they must work together to achieve learning for all students; they create collaborative cultures to do so. Most teachers felt that district leaders should introduce new teachers to the PDSA with an initial training, and there should be a continuous training throughout the year for all teachers. This finding indicated that there should be a change in the culture of the school; teachers should work collaboratively because collaboration is known to be a best practice (DuFour, 2004b). It is also important for teachers to collaborate to

determine how to best help diverse groups of students and get results (Murawski &

Lochner, 2017).

Discrepant Cases

Participants generally agreed that there is a need to train teachers on the PDSA,

initially and continuously. Discrepant cases were not evident due to detailed and

extended responses received during data collection and the member checking process.

However, during one of the interviews, one participant, Teacher 6 shared the inability to

use PDSA because no one explained how to use it. I documented this information during

the interview as vital information related to how Teacher 6 implements PDSA in the

classroom. The information stood out to me when Teacher 6 shared it in the beginning

because I did not think this teacher would have anything interesting about the PDSA to

share. Nevertheless, as the interview went on, Teacher 6 shared that as a teacher new to

PDSA, a colleague gave a copy of the PDSA book which was used in the first district

PDSA workshop; Teacher 6 used this information to set up a data wall. During the

document analysis, Teacher 6's wall had the most detailed information posted on the

bulletin board. I noted the areas that were missing under each label; the Study and the Act

section had missing information. All this data was included and analyzed as essential

information to perceptions about utilizing the PDSA for analyzing data in the classroom.

Evidence of Quality

After all the data were collected and analyzed, I triangulated it by comparing the

sets of data to verify the validity of the initial findings. I crosschecked the less obvious

findings and potential bias by comparing the different data sources with one another. The

findings revealed that the participants' responses to the interview questions corresponded with the PDSA exhibit on their data wall during the document analysis questionnaire. While the participants responded differently to both forms of data collection, the emerging themes still aligned.

First, I conducted face-to-face interviews with individual participants in a private, secure room after school hours. I provided all participants with think time after each question to allow them to think before answering the questions. I recorded all interviews with a voice recorder, listened to it completely, and transcribed the recorder information to construct an exact version of each of the participant's responses. I completed this process after each individual interview. Listening to the interview questions and transcribing them afforded me the opportunity to hear the participant's perception and beliefs clearly. In addition, transcribing gave me time to record some of my own thinking and identify areas where probing follow-up questions was needed or not needed. For example, after the first interview, I realized that the participant had answered the question but did not give specific, in-depth details to one of the questions. I made note that I had failed to ask one of the probing questions that probably would have prompted answers that are more detailed. Therefore, during the subsequent interviews, I made changes, and I was mindful and intentional about asking probing questions when participants did not provide an in-depth response to the interview questions. In addition, I could become more aware of when participants provided in-depth responses that covered the answer to probing questions, without me even asking the probing question. This interview process resulted in more thoughtful, rich responses.

Secondly, I observed each participants data wall for 25-30 minutes to note how the participant created and set-up data walls to see if they displayed all parts of the PDSA with appropriate information. If the parts were visual, I checked it off on the document analysis form (Appendix G). I also asked each participant questions and recorded how the participant used the data wall when going through the PDSA. For example, Teacher 8shared that it is easy to post the Plan because it is already on the lesson plan weekly and all they must do is copy and paste it on another sheet and make the font bigger than print, post, and go over it with students. Several of the participants said that they always tell the students what they will be doing, even when it's not posted under the Do section of PDSA. For example, Teacher 8 did not have anything under the DO section, so I did not check it off, but when I asked questions from the document analysis about how the data are used PDSA in class Teacher 8 said,

> I don't always post what we will do under the Do section because I have a daily agenda posted and I go over the agenda daily to share what we will be doing in class. However, the Do on the PDSA reminds me to go over my agenda with my students after I discuss my objective for the day.

I also recorded reflective notes about my observations and personal thoughts on the document analysis form. For example, because I could witness an agenda with a list of activities that the students do in class, I noted that teachers sometimes use an agenda to discuss what the teacher and students will do.

Two different forms of data, interviews and document analysis, provided me with rich data that captured the recurring themes. I analyzed the data by first, coding and re-

coding and then, I triangulated the data by comparing the interview response to the evidence collected during the document analysis. Finally, I used member checking to give the participants an opportunity to verify the data I collected. I sent each participant a copy of my initial findings through e-mail, and I allowed the participants time to read and respond to the projected findings. I asked each participant to review the findings to ensure that I captured their perceptions accurately. I gave each participant the opportunity to discuss the findings with me if they felt the need to do so.

Teacher 8responded with the need to add clarification. Teacher 8 sent me an e-mail with an additional perception, and I followed up by meeting to discuss and ensure I captured the thoughts accurately. The member checking process allowed me to decrease the chance of interpreting incorrect data; it also gave me a chance to get feedback on emerging findings from participants. By using code-recode, triangulation, and member checking, I ensured that the findings were an accurate reflection of the participants' thought and perceptions. Transcripts of interviews, document analysis, implementation notes, and reflection notes provided evidence of data collection that resulted in data analysis.

Discussion of Findings

In this section, I discuss three study findings in connection with the study's data and current literature: (a) teachers acknowledge that using the PDSA for analyzing data is time-consuming, but it is an effective model to identify learning goals and plan future instruction, (b) teachers rely on assessment data to teach, re-teach, and differentiate

instruction to address the needs of all students, and (c) teachers would like to engage in initial training and on-going, collaborative workshops on using the PDSA to analyze data.

Finding 1

The first finding revealed that elementary and middle-level teachers acknowledge that using the PDSA for analyzing data is time-consuming, however, it is an effective model to identify learning goals and plan future instruction. Murawski and Lochner (2018) advised that lessons that are more effective take place when you walk in class knowing what your goals are and what you are going to do. The PDSA is an effective tool that usually does take a considerable amount of time to go through all the phases (Baxley et al., 2011). However, the time required to complete the PDSA is vital to ensure that users do the model adequately using all parts. Going through the entire cycle ensures that the teacher and students can monitor and adjust learning and instruction for continuous improvement. When teachers put all parts of the cycle together, the classroom becomes a learning system that teachers can use to improve learning results (Jim Shipley & Associates, 2012). Many found the PDSA cycle to be effective for continuous improvement in many areas. For example, PDSA proved to be effective for quality control in science. Industries continue to use the process to monitor quality control in car manufacturing; Toyota currently uses the process due to its effectiveness (Murawaski & Lochner, 2017). In addition, PDSA proved to be effective in healthcare by improving the quality of care, making healthcare safer and more efficient (Donnelly & Kirk, 2015).

Finding 2

The second finding indicated that teachers rely on assessment data to teach, re-teach, and differentiate instruction to address the needs of all students. Researchers also refer to the PDSA as a recursive loop that helps educators plan, act, reflect, and make changes based on the data (Murawaski & Lochner, 2017). The participants in this study shared that they continuously revisit initial plans to determine what they should not do next if students did or did not meet the goals according to assessments. In fact, DuFour et al. (2008) suggested that it is important to reflect on PLC questions such as, "What will we do when students have or have not learned?" The teachers all demonstrated recursive processes when going through parts of the PDSA. The participants all expressed that they look at the results of their assessments to determine the next steps if they did not get the results they wanted. As mentioned by Murawaski and Lochner (2017), if you do not get the results you want, "create a plan to identify what you think you need to do instead. When you move back to the 'Plan' phase, you'll figure out your objectives and processes for trying to address that same competency, but with a different method" (p. 11). Participants agreed that they use different methods to make changes when they do not receive desired results the first-time students are assessed. The methods may involve grouping students into tiers, differentiating instruction, and revisiting the objective (initial plan) by reviewing, re-teaching or re-testing. It is important for teachers to administer assessments so that they can monitor student progress and data to respond to assessment results by adjusting instruction, re-grouping students, and re-teach as needed (Abrams et al., 2016).

Finding 3

The third finding identified that teachers would like to engage in initial training and on-going, collaborative workshops on using the PDSA to analyze data. Based on this finding, the participants in this study felt the PDSA would be more effective if the leaders could train the teachers on PDSA, and train the teachers on how to work collaboratively with common teams within the school so that everyone can be on the same page. DuFour et al. (2016) believed, "the best team structure for improving student achievement is simple: a team of teachers who teach the same course or grade level (p. 61). The participants all perceived that there should be an initial and continuous training on the PDSA collaboratively throughout the school. This way everyone knows how to use the PDSA cycle effectively in his or her individual classrooms to benefit all students. Bambrick-Santoyo (2010) recommended launching an introductory training on core concepts of data-driven instruction and following up with ongoing professional development. Collaborative teams with shared visions, missions, and values can accomplish more as a team, for student achievement as opposed to when the teams do it individually (DuFour & DuFour, 2010). Murawaski and Lochner (2017) suggested that student achievement is typically the primary focus of PLCs and members; therefore, teachers should work side by side to clarify what each student must learn, monitor their progress, and provide support or enrichment as needed. In addition, educators should collaboratively gather evidence of student learning, take responsibility for student learning, and clarify how they will work together; PLCs are able to provide a way to create a collaborative culture (DuFour et al., 2016). Similarly, Murawaski and Lochner

also stated, "the overall PDSA cycle establishes a structure for adapting the PLC's knowledge and putting it into practice in a supported, systematic way" (p. 35). Therefore, PLCs are an idea for providing participants with school-wide, collaborative, on-going training on PDSA; because they all expressed the need for it.

Connection of Findings to Conceptual Framework

I based the conceptual framework that grounded this study on Bambrick-Santoyo's (2010) principles for effective data-driven instruction. The conceptual framework provides a structure for teachers' research and reflection to guide their collection and analysis of student performance data. Bambrick-Santoyo recommended four principles that grounded this study; they are (a) assessment, (b) analysis, (c) action, and (d) culture. The second finding in which teachers rely on assessment data to teach, re-teach, and differentiate instruction to address the needs of all students is aligned with Bambrick-Santoyo's principle about assessments. As part of the conceptual framework for this study, Bambrick-Santoyo (2015) suggested that assessments be used to drive instruction, and teachers should analyze students' shortcomings and strengths and act based on the analysis. All teachers in the study use assessments at the beginning of their instructional cycle and the teachers study the results to decide where to go from there; this may require changing up instructional strategies. Most teachers in the study also shared that they let the results do the talking; after each round of assessments, the teachers see which strategies were most effective based on the results shown on the assessments (Bambrick-Santoyo, 2010). Bambrick-Santoyo's principle of culture supported the third finding. The finding indicated that teachers would like to engage in

initial training and on-going, collaborative workshops on using the PDSA to analyze data. This finding aligned with the principle of culture because Bambrick-Santoyo (2010) recommended that part of building a data-driven culture involve establishing a calendar that schedules time for assessment, analysis, and on-going professional development. Bambrick-Santoyo also suggested that teachers and leaders have introductory training on data-driven instruction, ideally including introduction, assessment, analysis, and action to build a data-driven culture. This suggestion aligned with the participants' request for initial and on-going training on PDSA. Lastly, Bambrick-Santoyo (2010) suggested that teachers build by borrowing which is a best practice that allows teachers to share resources and good strategies. According to finding three, participants in this study would also like to work collaboratively with other teachers in the school. The findings in this study showed that teachers believe the PDSA is effective in revealing data from assessments that teachers can use to analyze students' weaknesses and strengths and determine actions teachers should take based on results. Teachers use assessment data to determine if they should re-teach or differentiate instruction in the next learning cycle. In addition to assessments, analysis, and action identified in the findings, the fourth principle, culture, focused on teachers need to have a supportive environment for data analysis and data-driven instruction; this was also identified in the findings.

Conclusion

By capturing the perceptions of elementary and middle-level teachers about using the PDSA to analyze data to inform instruction, I addressed three research questions. The research questions helped to bring focus to the study so that I could conduct rich

conversations with the participants about individual views on using the PDSA (Lodico et al., 2006). The conversations from the research question allowed me to gain more meaning and understanding of the topic. The three research questions related to teachers' perceptions about using the PDSA, how teachers use assessments to inform instruction, and professional development opportunities needed to support using the PDSA to enhance using data to inform instruction.

In finding one, I indicated that teachers acknowledge that using the PDSA for analyzing data is time-consuming, but it is a useful model to identify learning goals and plan future instruction. To illustrate Finding 1, all participants recognized that the PDSA is a good way to monitor instruction and make necessary improvements. The participants also shared concerns about the time it takes to complete the entire PDSA.

In finding two, I indicated that teachers rely on assessment data to teach, re-teach, and differentiate instruction to address the needs of all students. To illustrate Finding 2, during the interview, participants shared specific examples of ways they adjusted their instruction during the PDSA cycle to improve teaching and learning for students. Some of the ways mentioned were: a) differentiation, which involves using different instructional strategies to address students' weakness and strengths, b) re-teach, which involves teaching the whole concept again (maybe in a different way) if most of the students did not master c) review, which requires the teacher to go back over content from an assessment if needed.

In finding three, I indicated that teachers would like to engage in initial training and on-going, collaborative workshops on using the PDSA to analyze data. I illustrated

finding three when participants provided their insight on what an idea PD on using the PDSA to analyze data should entail. The participants strongly suggested that the school district should provide a school-wide initial training for new teachers on the PDSA and then there should be occasional training as a refresher for already trained teachers. In addition, the participants believed there should be time designated for on-going collaboration on current data to inform instruction.

I learned that the participants are willing to want training on the PDSA, but it is not available. I also learned that the participants would prefer time to collaborate and work with colleagues as opposed to working individually. Therefore, I will design a PD project to support teachers in using the PDSA as part of a PLC. I will design the PD so that they will learn how to set up data walls, learn to engage students in data analysis using the PDSA cycle, and use PDSA during PLC time. The PLC will provide the teachers with collaboration time that they are lacking.

The current findings captured the teachers' perceptions about using and analyzing data to inform instruction. A review of literature about using and analyzing data in PLCs will be used to gather the perceptions of scholars who studied culture, PLCs, and continuous improvement models such as, PDSA. In the project design, I will draw information from the findings and the literature review to provide teachers with information on how to create a culture in which they can collaboratively plan and implement the PDSA to analyze data to inform instruction.

Section 3: The Project

Introduction

This qualitative study captured elementary- and middle-level teacher perceptions about using and analyzing data to inform instruction in a case study design. Findings revealed the collaborative culture, initial training, and on-going training that teachers need in order use the PDSA to analyze data to inform instruction. The following section includes an outline for a project based on the genre of professional development. Through this project, I provide teachers with insight and instruction on how to create a culture that allows the opportunity for collaboration and to assist teachers in using the PDSA to plan instruction and engage students in the data analysis process. I describe the project goals, rationale, implementation, potential barriers, potential resources, and supports to assist teachers who may struggle with implementing the PDSA. The project may serve as a model for districts that would like to use this project or create a similar one to effect social change through data analysis in their schools. I include a review of the literature to deepen and expand my study's findings and critical components. Finally, I discuss the evaluation of the project to offer a framework for reflection on the project outcomes and possible improvements or changes.

Description and Goals

Description

This project is a 3-day PD for teachers who want to increase their understanding of a collaborative culture that fosters data analysis to improve instruction, and for teachers who want to learn how to use PDSA to monitor student data collaboratively with

team teachers and engage students in the process of continuous improvement. I created this project based on study findings that indicated that teachers would like to engage in initial training and on-going, collaborative workshops on using the PDSA to analyze data from assessments. In this section, I outline the purpose and goals of the project. The overarching goal for the PD is to equip teachers with the knowledge, materials, and skills to assist them in creating a collaborative culture that allows them to use data to improve teaching and student learning. Furthermore, each day of the program will have a unique purpose along with additional goals.

During the first day of the PD, I will present teachers with an overview of what the training will entail during the 3-day PD sessions. I will also provide research-based information on building a collaborative culture using PLCs. This first workshop will allow time for teachers to create a common formative assessment implementation calendar that the teachers can use during PLC time to bring focus to the collaboration time. In addition, teachers will engage in an activity to introduce a sample PLC form that can bring structure and support and document meaningful collaboration. On the second day of PD, I will engage teachers in an overview of the PDSA and provide them with a PDSA form that can be used to collaboratively plan instruction within a small group within the same content or grade-level. In addition, I will provide teachers with time to create a lesson plan and to use the lesson plan as a guide to complete the PDSA form. Finally, I will engage the participants in a share-out group. On the third day of the PD, I will present an overview of essential parts of a data wall. This set-up is a model of the data wall that teachers will use to engage their students in the data analysis process. Next,

I will facilitate the group as teachers work individually to create the PDSA labels that they will use on their classroom data walls. Finally, the teachers will share-out the model of what their data wall will look like in class with the labels on it. In addition, I will lead the group in a discussion and creation of a sample mission statement. This part of the PD will provide the participants with exemplars from which they can later customize a mission statement in class with their students to post on the data wall.

Rationale

The problem that prompted this study was that elementary- and middle-level teachers in a rural school district in the Southern United States were not able to monitor academic progress effectively using PDSA, a district prescribed data-driven model. I based the conceptual framework that grounded this study on Bambrick-Santoyo's (2010) principles for effective data-driven instruction. The four principles Bambrick-Santoyo recommended are (a) assessment, (b) analysis, (c) action, and (d) culture. The conceptual framework led me to create a PD project because teachers expressed that they would like to participate in ongoing, collaborative training on data analysis and PDSA. Bambrick-Santoyo advised that an effective data-driven culture should be embedded within the drivers of assessment, analysis, and action. He also pointed out that it is important for educators to take care when building a culture of data-driven instruction; educators should frame assessments as opportunities to improve teaching (Bambrick-Santoyo, 2010). The PD project offers a way to introduce teachers to a culture of collaboration that focuses on student achievement. DuFour et al. (2016) suggested that for student achievement to increase through collaboration, teachers must be engaged in the right

work of PLCs. The right work of a PLC is the center of four questions: (a) What do we want students to learn?, (b) How will we teach them what they need to learn?, (c) How will we know when they have learned it?, and (d) What will we do when students learn or struggle to learn? Because PLCs are recommended for helping students achieve at higher levels and for increasing teacher collaboration opportunities (Hallam et al., 2015), it is vital to creating a PD in which teachers can learn about PLCs. Teachers can use PLCs to collaborate and intentionally plan the implementation of common formative assessments. Therefore, PLCs are an ideal way to provide teachers with training on the PDSA and using it to analyze data.

Furthermore, Murawski and Lochner (2018) recommended using the PDSA to establish a structure for adapting and putting PLCs into practice in a supportive, systematic way. Thus, I chose a project to accommodate time for developing and using the PDSA in a collaborative culture. The participants can also use on-going collaboration time through PLCs in the future to analyze assessments, to plan lessons, and to drive instruction. As pointed out by Bambrick-Santoyo (2010), often schools make time to test but schedule no time to implement each step of the data-driven process. As a result, I have designed the PD for Day 1 so that teachers will learn how to conduct PLCs and will schedule time for assessments, analysis, and PD on PDSA. The PLC will provide teachers with the forum needed to work interdependently and to share knowledge of best practices with colleagues. These PLC activities may guide teachers toward positive student outcomes. When colleagues discuss results from assessments, make instructional decisions, and change lessons based on current data (Murawski & Lochner, 2018), they

provide students with focused and beneficial instruction. Dufour et al. (2016) highlighted the importance of having focused collaborative PLCs that help students achieve at higher levels. The researchers also suggested PLCs that allow teachers to engage in a systematic process to analyze their professional practice to improve results. The PLC process encourages teachers to improve student and adult learning (DuFour et al., 2016).

Day 2 will involve training teachers to use the PDSA to guide collaborative planning during the PLC, because the PDSA provides a structure for conducting PLCs (Murawski & Lochner, 2018). I will give teachers the opportunity to use the PLC form introduced and modeled for them on Day 1. The teachers will use the document to discuss their next common formative assessment and collaboratively plan their lesson using the PDSA as grade and content level teams. As recommended by Bambrick-Santoyo (2010), when providing PD for adults, the participants should not merely be listening to lectures, which means that teachers should be involved in generating the content that they can put into action. Following overviews of PLC and PDSA on the second day, I will offer time to create the essential parts of the PDSA for teachers' data walls. Trainers, who want teachers to put the training into action, should provide concrete tools for teachers to implement the new learning immediately in their schools (Bambrick-Santoyo, 2010). It is vital for teachers to move past talking and take part in activities that matter at the school level (Hess, 2015). This PD will also include time for breakout sessions so that teachers can develop and set up a data wall, frameworks of the PDSA for immediate implementation in their classrooms.

During Day 3 PD, teachers will create essential parts of the PDSA by setting up data walls. Because the Day 3 workshop will involve showing teachers how to engage students in the process of PDSA, allowing teachers time to interact with their data wall and present it to the whole group for feedback will improve their competency levels. Another reason I chose this project genre was to allow teachers time to engage in a productive PD so that they will feel more prepared to work with students and to use data to identify improvements in student performance (see Bayar, 2014). Nudrat and Akhtar (2014) suggested that schools apply extra effort to prepare teachers to feel comfortable leading initiatives in schools. The Day 3 PD activities will allow teachers to use the PDSA for students' engagement in the data analysis process. In this study, teachers also revealed that they would like to engage in an initial training as well as on-going, collaborative workshops about analyzing data. Teachers believe that PD is effective if the facilitators organize the PD based on the teachers' classroom needs and if it is provided consistently over extended periods (Bayar, 2014). A recursive process over extended periods will allow teachers the opportunities to learn new skills, to test the new skills, and to check for clarity and understanding.

Consequently, I designed ongoing PD work sessions to keep the teachers' needs in mind so that the PDs can be useful. Similarly, I based the PD on an analysis of data drawn from the interviews and the document analysis that revealed patterns, relationships, and themes about the perceptions of teachers about using and analyzing data to inform instruction. I created the PD to address the study problem by including current findings into a series of progressive, collaborative activities of common planning,

and of knowledge- and resource-building. I drew the content from what participants felt were important aspects for them to receive training to use the PDSA to inform instruction through data analysis. The teachers believed that training should take place in a collaborative environment that could allow them to use the assessment data to plan future instruction. The three findings provided the informational core of the PD: common planning, discussion, and collaboration.

I created PowerPoint introductions to outline and illuminate the PD sessions and to focus the learning plan for each session. The slides include research-based examples of effective implementation of PLCs, and I designed the slides to assist participants with reflecting on their current practices of data analysis so that they may become more aware of effective strategies to use during collaborative planning time. Participants will receive a printed duplicate of the slideshow to fill in as a place to take notes, jot down inquiries, or reflect on the presentation as I project the slides on a Promethean board. In this way, the participant will have a hard copy to refer to and reflect on once the training is over. In specific cases, a given slide will indicate a site with a useful video, such as the video on conducting effective PLCs on analyzing and using formative assessment. In addition, I will offer participants examples and readings from other useful websites to assist them with the data analysis process. In addition to these examples, participants will be encouraged to share their favorite tools, resources, and insights with their common grade level team by placing the notes on a resource board by the front of the room. By participating in this way, teachers will be able to contribute by sharing their expertise with their colleagues. An important role of a PD facilitator is to manage reflection and

sharing time as individuals, small groups, and large groups so that participants can

solidify learning (Bambrick-Santoyo, 2010). To build a sharing relationship with all

members, I will use PD protocols that encourage sharing and reflection. Moreover, I will

provide teachers with a data notebook that has the materials to build resources needed to

create the essential parts of their data walls.

These protocols were drawn from my personal experience as a teacher from 2012-

2015. During this time, I participated in several district summer institutes and year-round

workshops that provided time for work sessions so that teachers could create lesson plans

and have time for collaboration between colleagues. As the lead teacher from 2015-2017,

I was the facilitator of the bi-weekly PLC for my grade level. These experiences allowed

me to observe protocols that are useful for creating an environment in which teachers can

use assessments to collaborate and plan lessons accordingly. I designed the PD sessions

developed for this project to help participants understand that a culture of collaboration

involves sharing insight and learning by doing. The three PD days offer work sessions in

which participants are encouraged to collaborate, share ideas, and plan as a team. I

designed this experience to simulate the work of a collaborative school team.

I also intended for the PD series developed for this project to involve participants

in a hands-on learning session focused on teachers creating a data analysis culture and on

transferring that data analysis process in the class to engage students in using data. Day 1

of the PD sessions is designated for participants to how to establish a PLC culture

centered on assessment data. The second day, however, will offer increasing amounts of

time for work sessions to help participants develop and share examples of documents that

the participants may use to guide a PLC culture. Lastly, the third PD day will be to develop content that the teachers can use immediately to engage students in the data analysis process. Each day, time will be available for reflection, open discussion, and shared learning in which participants will be encouraged to think deeply about their state of competence, needs, and expertise as teachers and how this expertise will affect their students' achievement.

Review of the Literature

A review of the literature helped me to connect teacher participants' reflections to the literature on collaborative planning to improve instruction and data use. I searched scholarly literature with keywords such as *collaborative data school culture*, *school culture*, *school culture and data use*, *professional development, professional learning, professional development and adult learning, adult learner motivation* and *andragogy*. To show historical viewpoints, I included some literature published longer than 5 years ago. The review of literature assisted me in creating a project based on my findings and allowed me to illuminate the following significant ideas that emerged from the data analysis:

1. Teachers engage more in data analysis when schools develop a culture of collaboration.

2. Teachers strengthen their ability to analyze data from assessments to improve their instruction by engaging in professional development.

In the following sections, I explore the research related to these critical themes. I expanded and deepened this exploration of the literature related to adult learning,

andragogy, teacher collaboration, school cultures, and PD. This literature review includes current literature related to the topics of adult learning, cultures of collaboration, and teacher PD.

Supporting Adult Learners

For educators to stay informed about changes in education, continuous learning is necessary to enhance professional skills that benefit the teacher and students (Evans, 2014). To teach adults, it is imperative to understand how they learn and to become aware of how to support that learning. Knowles, Holton, and Swanson (2014) confirmed that it is essential to understand characteristics of adult learning, and the best ways adults learn. One way for educators to learn is through job-embedded training and PD that internal or external sources of education may provide (DuFour, 2004b). One well-regarded approach is for school leaders to send interested teachers to workshops, so they can learn about a program, return to their home schools, and train other teachers about the program. The train-the-trainer approach is a PD strategy that provides for one teacher within a system to become a subject-matter expert (Marzano, 2011). The primary and secondary levels mainly use the train the trainer model so that teachers can share their expert skills and knowledge with other teachers (Marzano, 2011). In support of this train the trainer model, leaders may send interested teachers to outside workshops to become in-house experts in order to teach colleagues. Once these delegates return to their respective schools, they become responsible for sharing the knowledge with teachers. Likewise, leaders of education also expect teachers to share knowledge of effective

teaching practices used in their classroom with colleagues in PLCs, as another way to teach (Hallam et al., 2015).

In order to share knowledge with others, facilitators of education must learn to teach adults in a way that is appropriate for the adult learner to understand so that the learning transfers to the classroom to influence student achievement (Stewart, 2014). As suggested by Meador (2016), teacher quality influences learning, and when teacher quality improves, it can result in students achieving at higher rates. Utilizing methods and delivering lessons in ways that are conducive to adult learning so that the adult can apply the lessons in the classroom is essential because the training will affect the adult students' learning. Adults and children process what they learn differently, so educators must teach adults accordingly (Rochester Institute of Technology, 2013). Knowles et al. (2014) and Schwartz (2013) suggested several important factors for teaching educators in a way that supports their learning needs.

To teach adults successfully, educators first need to understand the differences between children and adult learners (Brookfield, 2013). The term, andragogy, is a synonym for teaching adults; the term refers to being learner-focused. Knowles (1970) defined *andragogy* as the art and science of helping adults learn. On the other hand, Knowles (1970) described pedagogy as the art of teaching a theoretical concept or an academic subject (Knowles, 1970). Researchers often relate pedagogy to teaching children and to a teacher-focused model; they use it to describe the teacher overseeing children's learning (Darling-Hammond, 2010). Knowles et al. (2014) did not support this notion of giving teachers control over the learners. Conversely, Knowles (1970) noted

that adult learners should be involved in planning and evaluation their learning. Knowles et al. (2014) identified several other principles of adult learning such as the following: (a) adult learners are inspired by their own life goals and self-direction, (b) adult learners bring personal and professional life experiences to the learning environment, (c) adult learners are inspired by the tangible and abstract things they want to achieve, (d) adult learners are guided by what is meaningful, (e) adult learners are practical, and (f) adult learners aspire to be respected as adults (Knowles et al., 2014). Similarly, Schwartz (2013) reported characteristics unique to adult learners such as (a) adult learners are selective; (b) adult learners are self-directed; (c) adult learners are experienced and have previous knowledge, and (d) adult learners have a problem-centered approach to learning (Schwartz, 2013). Because the characteristics of adult learners differ from that of children, professional development must be defined within those characteristics. In order to teach adults successfully, facilitators must recognize that adult learners are selective, self-directed, and experienced.

Adult learners should have an opportunity to select what they would like to learn. Selective learning implies that adults prefer to learn things that are important, interesting, and meaningful to them (Knowles et al., 2014; Schwartz, 2013). To solicit adult participation in professional development, it should be engaging and relevant (Stewart, 2014), if it is not important enough to use in class, if adults do not find it interesting, and if adults cannot find meaning in what the facilitator expects the adult to learn, they may choose not to participate. It is also important for facilitators to be aware of the outside factors that may influence adult learners' choice to participate in PDs; most adult learners

have family obligations and full-time jobs that may influence their desire to increase their learning (Nohl, 2015; Peterson & Ray, 2013). Therefore, adults should be involved in choosing the topics that they want to learn and given optional times to participate in the learning.

Adult learners should also have input on how they would like to learn once they discover what they would like to know. Self-directed learning involves identifying personal learning needs, choosing how to learn, setting goals, gathering materials, and evaluating progress (Knowles, 1970; Knowles et al., 2014; Schwartz, 2013). As recommended by Bayar (2014), teachers should be involved planning and designing their professional development. Therefore, adults should have some autonomy over what leaders expect them to learn. Moreover, as suggested by Owen (2015), leaders should involve adults in setting goals for professional development so that they are attainable. Facilitators should give adult learners responsibilities that will allow them to take ownership of their learning (Rochester Institute of Technology, 2013). Bambrick-Santoyo (2010) recommended letting adults generate the content themselves. Taking ownership means the adult learner can choose their direction of learning without the help of others, become more independent, and engage in a personal plan to accomplish goals that have been set (Johnson et al, 2014; Nohl, 2015; Rochester Institute of Technology, 2013). For example, facilitators may offer time for reflection to allow adult learners to set personal learning goals, to reflect on their learning, and to evaluate if they achieved their goals (Darling-Hammond, 2014). Guided reflection allows teachers to evaluate their teaching

practices, which in turn will promote student learning (Darling-Hammond, 2014). This may increase teachers' motivation and the value they place on their teaching.

Adult learners also have more experiences with life and learning than children do so they are more motivated to learn in order to increase knowledge (Knowles et al. (2014); Schwartz, 2013; Van Genderen, 2013; Weber, 2014.). Teachers should consider their own learning experiences when teaching adult learners, because their experiences may guide how they work with adult learners. According to Battista and Ruble (2014), when adults can make the connection between their experiences in life and the instruction provided in the classroom, they become more cooperative and motivated. These experiences in life allow adults to be aware of their own learning, even when they are required to teach something to others; the process helps to improve overall learning (Nohl, 2015; Samaroo Cooper, & Green, 2013). Workshop facilitators should be mindful of the prior knowledge adults bring so that the facilitators of adult learning may plan workshops with learning that connects to motivation and experiences (Weber, 2014). When teachers become motivated, they are more willing to use and share what they learn with others. Furthermore, adult learners appreciate when facilitators treat adults as knowledgeable individuals and not blank slates (Hill, 2014). Workshop facilitators should recognize adults as valuable resources when building a culture of collaboration to improve adult student engagement and performance. Treating adult learners as valuable resources because of their experiences may increase the learners' motivations.

Bambrick-Santoyo (2010) advocated five failures associated with adult learning that trainers should avoid, (a) teaching by talking, (b) teaching adults primarily by *I do-*

we do- you do (c) not specifically targeting leaders, (d) struggling to structure large-group

sharing, and (e) poorly planning transitions and time management (Bambrick-Santoyo,

2010). Trainers should also consider these frequent defeats when providing professional

development for adults.

Fostering a School Culture that Encourages Data Collaboration

In a collaborative school team, where the attention is on sharing ideas and

instructional practices, it is vital to keep teachers motivated. If the teachers are motivated,

it will increase the learning of all stakeholders including the knowledge of the teacher

whose role is that of a facilitator (Nohl, 2015). Nohl (2015) and Samaroo et al., (2013),

advocated that facilitators could develop their own learning while developing the learning

of others because of their experiences as an adult learner. Therefore, when teachers work

in PLCs and engage in collaboration and they all are learning, which results in

meaningful work (Hallman et al., 2015). Moreover, Hallam et al. (2015) recommended

implementing PLCs to increase student achievement and teacher collaboration. PLCs will

provide schools with the culture it needs to implement collaboration among all teachers.

As advised by Stewart (2014), professional development must be collaborative to

improve teacher instruction. Likewise, Cohen and Brown (2013) shared that a culture in

which teachers share ideas about instruction improves teacher practice and student

learning. Hence, teachers must collaborate to improve student learning.

Because researchers recognize PLCs as a means to provide a collaborative

culture, it is vital for educators to understand how to design it to create a culture of

collaboration. PLCs should be planned with goals and learning expectations embedded to

motivate participants; this motivation will increase the value that the adult learners place on learning (Chinnasamy, 2013; Peterson & Ray, 2013; Weber, 2014). Teachers agreed that educators should implement PLCs so that teachers can communicate more effectively (Dexter, 2014). When teachers can communicate more effectively, chances are they will be able to work together to share practices and improve student achievement.

Schools should develop a school culture where teachers can work together to improve student achievement by using data to improve instruction (DuFour, 2016). Educators shape school culture by building shared values, beliefs, behaviors, and a focus on students' achievement within that school community (Carpenter, 2015). For school teams to improve student success, everyone must commit to doing things a standard way so that the attention will be on student learning (DuFour, 2016). Student achievement relates to shared core beliefs, a clear, focused purpose, and intellectual engagement (Deal & Peterson, 2016). Leaders of a school should ensure that they create a collaborative environment centered on student learning and not just teaching. This will ensure that student achievement improves. When leaders have a clear vision for their schools, it has a great impact on teacher performance, and it encourages a data culture where even students take ownership of data (Militello, Bass, Jackson, & Wang, 2013). It is vital that schools create teams that are willing to use data to share and support effective instructional practices.

Teachers who use data must find time to share practices that are effective in their classrooms with colleagues so that everyone can accomplish the goal of student

achievement (DuFour, 2016). As recommended by Carpenter (2015), in order to have a

collaborative school culture, teachers must work interdependently to analyze and share

information about their professional practice to improve student achievement.

Collaboration helps to strengthen the instruction across the school and not just in one

class. Therefore, there is a positive shift in the entire organization, which promotes a

culture of data-driven instruction.

Changing the focus of the school culture may help educators become more aware

of the priorities, and this change may, in turn, shift their mindsets and habits about using

data to improve teaching. Spillane (2012) reported that many educators use data when

groups set professional community norms and provide regular opportunities for teachers

to discuss ways to use data to inform instruction. Schools should develop a culture that

has designated time for teachers to meet to collaborate about data from assessments in

order to adjust instruction to meet the learning needs of all students. In order for schools

to build a collaborative learning culture, teachers must understand that they can succeed

together and not in isolation. Additionally, leadership teams should expect teachers to

keep their knowledge up-to-date (Stafford, 2017). Leaders should set standards and high

expectations for using data as a team to improve student achievement. According to Dyer

(2013), teachers stated that it is vital to have support from colleagues when going through

changes in the school because it becomes a group effort and not a teacher's effort.

Teachers become supportive of established guidelines when they have teams working

toward common goals.

A great culture of data use starts when teachers know what they are responsible for doing when they collaborate. Therefore, leaders in education should establish clear expectations for collaboration when using data for improvement (Hagen & Nordmeyer, 2013). Teachers should know what routine and norms they should be following when they meet with common team members. Another way leaders can communicate expectations for data use, is by modeling the expected practice, documenting the policy, and presenting information about expectations (Gerzon, 2015). These actions will allow teachers to see the consistency in the organization and realize that there is a systematic way of doing things to improve teaching and learning. The facilitator of these PDs, will not only be sharing information about PLCs but will also model the way a PLC meeting should look when teachers return to their schools.

It is essential for leaders in an organization to determine what their culture will be like and choose how they would systematically bring it into existence. Bambrick-Santoyo (2012), recommended designing a clear vision for the work of the organization. One way to create a system for collaboration and define the work of the organization is by implementing PLCs. It is common practice for school leaders to divide their teachers into collaborative teams of the same department, content or grade level when implementing PLCs (Hallam et al., 2015). To create an effective collaborative culture, leaders should form these common groups intentionally. A culture cannot exist with one person. People should spend time together discussing expectations of each other to accomplish any goals they have established (Gruenert & Whitaker, 2015). Furthermore, when teachers partake in collaborative meetings with others they experience professional growth and they a

better able to meet class goals (Murugaiah, Ming, Azman, & Nambiar, 2014). Teachers in same schools and same content should work together to shape a collaborative culture in which they have designated time to discuss overall goals (DuFour, 2016). When teachers have time allocated for professional development, it encourages team planning and reflection (Janssen, Kreijns, Bastiaens, Stijnen, & Vermeulen, 2013).

Providing Teachers with Professional Development

One way for teachers to work together as adult learners to accomplish goals is through professional development. Professional development is the engagement of stakeholders in needs-based learning to plan, implement, and evaluate strategies to improve student achievement (DuFour, 2015b; Hargreaves & Fullan, 2012; Learning Forward, 2015). To increase the level of adult learning, an understanding of both andragogy and professional development is required (Peterson & Ray, 2013). Many schools provide teachers with professional development throughout the academic school year and sometimes extend it through the summer. Stewart (2014) suggested that professional development be collaborative and planned with activities that demonstrate teacher growth. Professional development occurs when stakeholders engage in learning based on their needs and use it to plan, implement, and evaluate strategies to improve student learning and achievement (DuFour, 2015b; Learning Forward, 2015). When teachers recognize they need support, schools should support them through professional development. Once teachers learn through a series of PDs, the teachers should be able to use what they learned in their classroom immediately and evaluate it to determine if it improved students' achievement (Department of Education and Training, 2017). This

process is an example of professional learning. Professional learning results from

learning that take place by using a wide range of professional development activities

(Department of Education and Training, 2017). Although the information provided in a

PD session should be practical, it is equally important for teachers to take the information

learned in PD and have time to discuss the information with other participants (Nohl,

2015). According to Bambrick-Santoyo (2010), group sharing is a critical component of

learning that allows participants to also verbalize and share their knowledge. Discussing

information as a group gives participants the opportunity to personalize the information.

One way a teacher can personalize the information is by addressing how the teacher will

apply the acquired knowledge in class (Nohl, 2015; Van Genderen, 2013).

Another way for teachers to personalize information is by processing the

information and determining how they will use it. In fact, researchers stated that it is

important for PD trainers to include time for personalized teacher-led decisions and

address how the knowledge gained applies to daily classroom practices (Nohl, 2015; Van

Genderen, 2013). Teachers should have an opportunity to take the information that was

presented in a PD and personalize how they will use it in their schools and classroom to

improve teaching and learning. Slavin (2014) recommended that learners engage in some

form of cognitive explanation of new materials so that they will learn and understand

them. For example, teachers may use reflective journals to help build an understanding of

the concepts presented during PD because it will allow time to personalize the

information shared by the facilitator. In addition, the trainer should designate time for the

participants to share out and cognitively. In fact, several researchers recommend that

learning be voluntary, appeal to experiences and motivation, and be collaborative in order to individualize PD (Peterson & Ray, 2013; Van Genderen, 2013). When trainers give teachers time to share-out, they show participants that they respect their expertise and differences (Knowles et al., 2014). Leaders in education should capitalize off the expertise that exists in their organizations due to the need for continuous learning and improvement in education. Because education evolves and the demands of education changes, teachers must be aware of these changes so that they may stay abreast. Leaders in school districts must arrange for teachers to learn and improve teaching by providing internal or external effective professional development. According to Bayar (2014) in order to offer effective professional development, there should be high-quality facilitators, and the professional development should match to existing teacher and school needs, involve teachers in planning the activities, and offer active participation with long-term engagement.

Conclusion

This literature review revealed that adult learning, culture, and professional development are connected to improved teaching and learning. The researchers whose works were reviewed shared the importance of valuing the type of learner, creating a collaborative culture, and providing professional development (Knowles et al., 2014; Schwartz, 2013; DuFour, 2016; Stewart, 2014). Professional development in schools requires consideration for adult learning because teachers are learning as opposed to teaching their students. As stated previously, the facilitator must understand that the adult learns differently from children. When conducting the PD series that stemmed from this

study, it is crucial for the trainer to consider the adults' level of motivation and experiences. This awareness will help maximize the participants' level of understanding because these experiences will help adults make connections to learning. Equally important will be for the school leaders to develop a culture of collaboration in which teachers can consistently use and analyze data together.

When teachers work in PLCs and engage in collaboration about using data, they all are learning, so the learning becomes meaningful. If learning how to use the PDSA is meaningful then teachers will more than likely use the PDSA once the 3-day training ends. The initial training and the PLCs should be planned with goals and learning expectations embedded to motivate participants. Cohen and Brown (2013) advocated for the use of professional learning communities to give teachers opportunities to learn instructional practices from each other that would change their teaching and result in gains in students' achievement. However, teachers will need appropriate training on how to use the data during PLCs. The literature also supports the notion of creating a culture in which teachers can reflect and collaborate with common groups to improve teaching and learning. This is also supported by the findings from this study which suggested that there is a need for teachers to be trained on PDSA. Once teachers learn to use the PDSA more effectively, they will be able to implement it in their classrooms and evaluate the system to determine if it improved student achievement. Once the teachers have started the training process, there will be a continuation of professional learning through PLCs. The PLCs will foster an environment of continuous learning. Facilitators should implement PD sessions in a positive environment that may encourage teachers to become

self-motivated and build self-efficacy that may result in effective life-long learning

(Akin, 2014; Bayar, 2014; Nohl, 2015, Weber, 2014). Teachers will have an opportunity

to get professional learning on data analysis to inform instruction during this PD, and

they will plan PLCs for the future sessions so that they will be able to apply and sustain

the learning after the 3-day sessions end. Professional learning should be ongoing and not

a one-time occurrence (Silva, 2015).

<div align="center">**Project Description**</div>

Potential Barriers, Resources and Existing Supports

Districts have many initiatives that they put in place to increase students' learning

experiences. District leaders seek to provide teachers with high-quality PD that will

enhance teachers' instruction to result in increased student achievement (Hunzicker,

2011). By offering the district this PD series, my goal will be to assist teachers in

increasing their knowledge of analyzing data and student progress monitoring that may

positively increase student achievement in all subjects. To implement this project, I will

need some resources in the forms of materials and assistance. Before the sessions begin, I

will meet with the district instructional leaders to share my study results and to present

my agenda for the PD sessions. I will ask the principal of the school to allow the teachers

some time to participate in the 3-day PD. I will send all elementary and middle-level

teachers and other stakeholders an e-mail invitation to the 3-day PD. Then I will ask the

instructional leader to follow-up by asking teachers to participate in the program,

preferably during the mandated summer institute. If I cannot plan the PD during the

summer institute, I will plan for implementation during the first month of school in

August. I will hold the PD sessions in the PD classroom or media center, using a laptop

and Promethean board. The instructional leader will assist with providing supplies

including copies of handouts, chart paper, chart markers, and cardstock for name badges

by using Title 1 funds from the school budget to purchase materials. I will provide pre-

developed documents, copy paper, timers, journals, and writing utensils.

Potential Barriers

One potential barrier may be the school administrator's lack of support for the

project. Although the principal of the school where I conducted this study supports this

effort, other school administrators within this district may not. Other administrators may

feel that the district staff, development leaders already provide the necessary training for

teachers at their schools. The school leaders may feel that they have competing priorities

that may not allow time to implement these the workshops. The administrators also may

not be open to giving up PD days that they may have scheduled for the teachers already.

In addition, they may be uncertain if this training will positively affect their teachers'

instruction and students' performance on state tests. To gain the support of school

administrators, I will present an in-depth overview of my study findings of teachers'

perception about using and analyzing data to improve instruction to all administrators and

instructional leaders. I will review the state summative assessment results data from the

previous school year, and I will engage the administrators in a discussion of how this PD

can bring teacher awareness to student progress monitoring. I will also try to schedule

individual meetings with each administrator to share information about how schools and

teachers can benefit from these PD opportunities when trying to reach goals to improve student achievement.

Another potential barrier is teachers may be reluctant to participate in a PD that requires more time and appears to be unnecessary work without additional compensation. The teachers may not want to spend time on extra PDs that the district has not mandated. To ensure there is teacher participation, I will schedule the PDs at a time that the district already requires teachers to participate in a PD. I will also let the teachers know that the workshop includes working sessions that will allow them to develop products that they will be able to use immediately upon returning to their classroom. In addition, all participants will receive a copy of the presentation for later reference. Moreover, the participants will have deliverables such as assessment calendars, lesson plans, and data wall labels that can reduce the time needed to complete these during the school year when planning their daily instruction. I will share with the teachers how collaborative planning and work sessions during the workshop may save them time on planning later. By attending this PD, the participants will have the opportunity to gain insights from their colleagues and prepare all components of their data walls, which is a required part of their learning environments.

I will ask the school administrator for a budget to provide snacks to the participants because the teachers will attend the workshops for extended periods. This budget may be from Title 1 funds that facilitators can use for light refreshments. If the school has already depleted these funds, then I will request that teachers bring their own snacks, or I will ask the parent-teacher association or a local business to donate

refreshments to the teachers. Space for meetings should not be a problem because I will host the PD at the designated time for weekly PDs after school or in the summer when the instruction is not taking place. If the district administrators approve the project, I will reserve time on the PD schedule and agenda early in the year. The instructional leader and staff members will be vital to the scheduling process because they are the ones who develop the schedule and topics for each school term. This team will ensure that I will be able to host the sessions in the designated PD room.

Proposal for Implementation and Timetable

Planning for implementation of the PD will take place during the academic year. This planning will include the principal, instructional leader, and me. Table 2 shows the details of the proposed timeline.

Table 2

Proposed Timeline

Date	Task	Person	Deliverable
June	Meet with principal and other administrators	Principal, Instructional Leader, Researcher	E-mail
July	Plan PD	Principal, Instructional Leader, and Researcher	Workshop Flyer/Announcement/ Agenda/Sign-in Sheets
July	Identify key participants	Researcher	E-mail
August	Develop volunteer survey and submit volunteer responses	Potential participants	E-mail/Surveys
August	Select first 20 participants	Committee	School e-mail announcement
September	Share presentation with principals and leadership team	Researcher	Slide show highlighting PD
September	Coordinate time and place for PD	Instructional Leader, principal, and researcher	Professional Development Schedule
October- May	Conduct PD sessions	Researcher and participants	PowerPoint Presentation, Materials

Roles and Responsibilities

My responsibility and role will be to organize all meetings, facilitate

communication between all stakeholders, and present all workshops for the professional

development (PD). The district administrator, the principal, and the instructional leader

are all important instructional leaders who can contribute to the success of this initiative.

The district administrator will support the work by approving for me to use the facilities

and conduct the workshop in the district. The principal will support the work by

encouraging the teachers to implement the PLCs, the PDSA model, and the use of data

walls that are part of the presentation. The instructional leader is responsible for securing

the PD room and scheduling the time needed for a productive presentation. In addition,

the instructional leader will also work with the presenter to review and approve the PLC

strategies implemented and to confirm their alignment with the district instructional

protocols and PLC expectations. To implement this program successfully, I will create

constructivist-learning experiences to involve participants in developing and using PLC

strategies. I will couple these activities with working sessions to provide participants with

active and reflective learning sessions. I planned the workshops to provide participants

opportunities to work in collaborative groups; the workshops will challenge participants

to share practices and create products and data wall components based on information

learned. The workshop will also provide participants with opportunities to review lessons

that have been effective in their experiences with using the PDSA model in PLCs. I will

provide time and space for participants to work collaboratively to plan assessments,

create lessons, and prepare data walls. Even though I will have a well-planned

professional development program, the support of all stakeholders will be essential for

successful implementation. I recognize that I am asking for stakeholders' time, facility

space, and participation when educators may have other pressing concerns and priorities.

Presentation of the project will support the district data-driven initiative. Therefore, the

presentation will be an important vehicle for school improvement efforts and the workshops will relate directly to the work of the district. In this way, my role will be that of a facilitator to all stakeholders in the district.

Project Evaluation Plan

Formative Evaluation

It is crucial for facilitators to check for understanding when working toward learning outcomes. One way to do this is by using formative assessments. Formative assessments help fill the gaps between current levels of performance and desired levels of performance. (Sargent & Curcio, 2012). To determine if the teachers are learning, I will need to check for understanding along the way. Formative assessments will allow me to assess if the participants are learning and to get feedback on the workshops. Formative assessments also are useful in helping to increase learning and motivation (Sargent & Curcio, 2012). To provide participants with opportunities to give feedback on the progress they are making toward the objectives set for the PD, they will reflect on what worked for them and what improvements the facilitator could make for the PD to be more effective. Teachers will have reflection journals to write personal notes at the end of the day. As a formative assessment, teachers will be asked to provide responses to the workshop events of each day by answering the questions: "what worked" and "what improvements are needed". Teachers will be provided with sticky notes to post their responses on posted charts that have *plus* (+) on one side to place their comments about "what worked" and *delta* (Δ) to place their comments about "what improvements are

needed". The teachers will use their reflective journals to complete quick notes to address key questions related to the daily objectives.

I embedded the formative assessments used in each session in the workshop PowerPoint presentations and notes. In addition to the written feedback, the participants will engage group conversations by asking probing questions. I will also display a parking lot poster for participants to post questions and concerns that I will respond to throughout the day. I can determine the participants' level of motivation and understanding of the content by allowing time for participants to engage in these discussions. Once each session is complete, I will review the participants' journal entry reflections and posted exit slips. This will help gauge if the content is addressing participants' needs, and it will allow me to follow-up with any gaps in learning the next day. The journal reflections and exit slips are a quick way to formatively assess participants' learning and check for understanding of the information presented. I will use the feedback data to measure progress against the intended learning outcomes. I will use the results to review and re-teach to ensure that the participants achieve the established goals for this PD.

Summative Evaluation

It is important for participants of a workshop to achieve the goals that they along with the facilitator established. For this project, I will use summative assessment to gauge how well workshop participants have accomplished PD objectives (Perera-Diltz & Moe, 2014). At the end of the PD, participants, administrators, and the instructional leader will complete a survey to evaluate the effectiveness of the content that I presented during the

PD. Participants will answer questions pertaining to the content of the presentation and the impact the content will have on their teaching and student learning. For the summative assessment, I will e-mail a Google form that will ask the participants to respond to seven narrative questions:

1. Did the presenter appear to be knowledgeable of the content presented?

2. Was the presented information relevant to instruction?

3. Do you feel you learned enough to implement the information from this PD immediately when you return to your classroom?

4. Explain what has been the most useful information you obtained during this PD session.

5. How will you use PLCs to enhance your instruction in your classroom?

6. How do you think the PDSA will influence student learning?

7. What recommendations do you have to improve this 3-day workshop?

A summative evaluation is helpful to evaluate how the participants' competency levels changed because of the PD (Pellegrino, 2014). Therefore, the answers to these seven questions will serve as a final assessment that I will analyze to determine how to improve future PD work sessions to assist teachers with successfully using the PDSA in PLCs.

Overall Evaluation Goals

The formative and summative evaluations directly align with the PD goals to assist teachers with implementing the PDSA to analyze data from assessments when conducting PLCs and using data walls in class. Teachers who participate in the PD will

be able to engage in hands-on activities to create documents that they may use in their classrooms to assist with implementing the PDSA. I include formative assessments in every PD session by building in time for reflections, having participants complete and post-exit slips, and engaging the participants in peer dialogues and share-outs about the covered content. When the participants complete the PD, they will receive a survey via e-mail containing seven narrative questions. The participants will submit the responses to the narrative questions and the electronic tool will collect automatic responses, and the system will show the results in real time. I will use this evaluation as the overall summative assessment to determine what teachers find useful and what I may need to be improved for future sessions. The evaluation process is a part of the PD training that engages teachers in meaningful conversations, deep thought, and on-going reflection about how to use the PDSA in PLCs and the classroom. I will use the overall evaluation to assess the effectiveness of the data analysis PD. This workshop can have a positive effect on teacher instruction and student learning; the evaluation and revision process will help to ensure this happens.

Key Stakeholder Group

I created this PD based on the findings from this study. It was clear that teachers work in settings that involve multiple stakeholders, and it will be important to include all stakeholders in collaborative planning related to the project. Participants for the PD will be district elementary and middle-level teachers and the instructional leader who will participate in all 3 days of the PDs. The principal and instructional leader will have the option to attend because they have other priorities that may keep them busy. The

instructional leader will assist the trainer and teachers with the workshop activities daily.

I will train the instructional leader so that he or she will be able to train district teachers in

the future. It would be ideal to have the administrators attend and participate in the PDs

with teachers because it would demonstrate the importance of attending PD workshops,

and it would give administrators an opportunity to identify teachers' abilities and observe

what the teachers will be implementing in their classrooms. However, administrators will

see the final products that the teachers create during the work sessions even if they are

not in attendance. For the timeline planning, I when I will invite the stakeholder groups

such as teachers, administrators, and the instructional leaders for the project planning and

implementation process.

Teachers. The main group of participants for this PD will be the first 20 teachers

who volunteer to participate in the program. The only additional group will be

administrators who choose to attend during one of the work sessions. The focus for the

PD will be to engage teachers in activities that they can implement in their classrooms

and PLCs to better assist them with using the PDSA to monitor student progress.

Teachers who volunteer to participate in the program may teach any school or some may

just work together, and choose to attend with the individuals that teach the same content

or grad-level as them. Collaboration, reflection, shared practices, and common planning

with colleagues may prove useful in their continuous improvement of instruction.

Administrators. The school principal and the instructional leader will form the

administrative team members who will be vital to the success of the PD. I will include

district and school administrators in the planning and implementation meetings. Because

principals are busy preparing for the school year and meeting other demands during this time of the year, I will schedule them at a separate time to give them an overview of the workshop's content and order of procedures. I will also invite administrators to share their expectations for PLCs and data walls on the last day of the PD, as their input is valuable for the success of this program. When the principals engage in the workshop, it will show participants the importance of the workshops. Perhaps this will encourage participants to plan their lessons successfully using the PDSA with fidelity because the district mandated its use. If administrators support the work developed during this time, the teachers may not have to change any of the final products they created during the sessions because they will know their principals' expectations. In addition, principals will be knowledgeable and better equipped to interpret classroom interactions when they observe classes and evaluate teachers in the classrooms.

Instructional Leader. The instructional leader is the person who makes all the decisions about the PDs that teachers need to support instruction, assists teachers with effective implementation of classroom instructional strategies, and provides opportunities for teachers to engage in effective PD that will help strengthen and support their instruction. I envision that the feedback that the participants will provide after the sessions along with the input and guidance that the instructional leader will offer, will help the teachers to discover ways to collaboratively plan instruction that will improve student achievement. The principal and the instructional leader are the driving forces who propel teachers to implement district initiatives in their classrooms.

Project Implications

Social Change Implications

When teachers realize that they can influence student success and to drive change and improve student achievement levels, they become agents of social change. After analyzing the data from this study, I revealed key findings that can have a strong impact on student achievement. These findings can have a strong impact on how teachers understand their own skills, abilities, behaviors, and dispositions to lead change in their own schools. Through my research, I have learned that teachers use data in their classrooms to monitor student learning, but they are willing to learn how to use it more consistently to monitor student progress and instruction to help their students increase their performance. I also learned that teachers prefer training on how to use data analysis systems more appropriately to monitor teaching and learning. This study also helped me recognize that it is crucial for all teachers to plan strategically to use assessments more frequently to gauge the learning in their classroom because it can have a positive effect on the students' future success. Using these findings as the basis to build my PD for teachers who desire to improve teaching and learning will allow me to assist teachers in their journey to improve data analysis and so that they may implement effective classroom instruction.

Effective teacher instruction will significantly impact the lives of individuals. When you provide students with high-quality instruction, it can influence their educational and career goals. Students may better prepare for college and career when teachers provide them with the instruction that aligns to state standards and analyzes the

data to see if students are proficient in the skills taught, and when they improve teaching based on the results. It is important for educators to build data systems that can help them improve instruction and monitor student progress toward standards (U.S. Department of Education, 2016).

Importance of the Project to Local Stakeholders

This project has potential importance to local stakeholders because I will offer it within the district where I currently teach. The teachers of this district could benefit from the PD because the PDSA challenges teachers to use a data analysis system without district leaders properly training teachers to use it effectively. During these meetings, participants will bring current lesson plans, data from student assessments, and share their experiences based on their implementation of the PDSA. This PD could provide an opportunity for teachers to collaborate, implement strategies to sustain a PLC, and learn new instructional strategies to increase their students' academic performance. I will reach out to the administrators, principal and instructional leaders so that they can assist teachers in implementing the new strategies as well as support them during the presentation of the PD. The project that I have developed because of this study's findings could prove to be of immediate use to the district and school leaders and teachers.

In addition, surrounding districts may become interested in creating more collaboration and participating in professional development centered on data analysis to improve instruction. Educators overwhelmed by the strong accountability and evaluation demands. Therefore, I anticipate that the findings from the study and the subsequent project that emerged from it will be important to local stakeholders.

Importance of the Project in the Larger Context

In the larger context, I believe that this project has great potential for assisting teachers and schools. Many schools across the nation successfully implement data-driven instruction that increased student learning. The leaders of these schools received training in data-driven instruction, and they can lead in some of the highest achieving schools (Bambrick-Santoyo, 2010).

I designed the presented project so that facilitators can continuously restructure it for recurring presentations on using and analyzing data from assessments in PLCs and classrooms. District leaders or facilitators can also modify this PD workshop for presentation to teachers of all grade levels. This modification would increase the effort of and support the district-wide initiative to use the PDSA to analyze data. Focusing on this as a district-wide initiative could help bridge the gap between what the district requires and what the teachers are doing in schools across the district. It may also bridge the knowledge gap that teachers have about using the PDSA. By doing this, schools staff members across the district would have the data analysis framework to meet across grade levels to determine where the gaps in teacher instruction and student learning exist. This would allow them to begin to work as a team to determine how they can decrease the number of students who are not proficient in college and career-ready standards. Teacher collaboration and implementation of PLCs would also increase. Finally, I plan to share this study's initial findings with my colleagues in local, state and national education organizations to lead conversations about how these findings may be useful to teachers.

Educators can use the PD that emerged from this study on a local and national level to increase classroom data analysis awareness.

Section 4: Reflections and Conclusions

Project Strengths and Limitations

Teachers in the local school of this study have been struggling to implement the PDSA effectively. This problem has affected teachers' ability to monitor instruction and student progress effectively. The data and findings from this study indicate that teachers are lacking the appropriate training needed to implement the PDSA that will help them monitor student learning and teaching. This is an indication that the district leaders need to give teachers an opportunity to engage in an effective PD on the PDSA. Providing intensive PDs may positively influence students' academic success and teachers' instruction. This section is focused on my reflections and conclusions about the project.

Project Strengths

This project's strengths connect to the research and analysis of findings. Schildkamp et al. (2012) suggested that schools are accountable for student progress so when teachers improve instruction, they may influence higher student achievement. DuFour (2004b) believed that a culture of collaboration involved teachers working together to improve classroom practices that may lead to higher student achievement. The primary goal of this PD is to improve teachers' use of data-driven instruction; however, the ultimate outcome of this PD may be the improvement of students' academic performance. In the PD that I developed based on this study's findings, the participants will learn ways to change the teacher culture within the school into one that is collaborative.

During the PD, teachers will have the opportunity to collaborate with their colleagues to plan practical lessons that can positively influence their teaching and students' learning. I have designed the sessions to engage participants in creating PDSA documents, PLC protocols, common collaborative groups, hands-on planning, as well as to assist participants as they develop components of a data wall. Participants will also gain a deep awareness of the importance of their relationships with colleagues as they collaborate to plan lessons that can assist them with student progress monitoring. This awareness, in turn, may also assist with accomplishing school, district, and state goals. The greatest strength of this project is that it will provide participants with opportunities to continuously learn and improve their instructional practices so that it may improve student learning. The teachers will be engaging in effective educational experiences that involve collaborating with their common team members and planning effective lessons that will impact their teaching and the students they teach. The PD will also allow teachers to gain insight how vital assessments are and what part it plays in improving student learning and teaching. The conceptual framework will guide how teachers analyze assessment data, act on it, and create a culture that can build effective data-driven instruction (Bambrick-Santoyo, 2010). The PD is designed to train teachers on how to how to use and analyze data to improve instruction by using use a data analysis tool, the PDSA.

Because of the PD, teachers can become part of a community of learners who use school improvement efforts to become teachers that are more effective. For that reason, this study may promote the understanding that the teaching profession involves

significant collaboration and sharing of knowledge that influences student achievement. The trends, issues, and changes in education suggest that there is a need for instructional improvement. Therefore, my goal is to encourage teachers to shift their mindsets so that they may see their daily work as important, public, and professional (Lieberman, 2010).

Limitations

One limitation of this study is that some teachers may not believe in the PDSA approach to data analysis and do not implement the approach in their classrooms, causing inconsistency of this process for students and PLCs. Another limitation of this study involves ensuring that the 3-day PD will begin an ongoing collaborative effort for teachers to use data from assessments to change teaching. However, the challenge would be to identify stakeholders who will sustain the efforts once the 3 days end. In addition, there will need to be a person designated to collect and review PLC forms when teachers submit the forms. This person may also need to stay informed of the new research to update the program as needed. This PD is an attempt to create a change in the school's culture, so I will offer all participants the opportunity to engage in an effective PD through collaborative planning. An effective PD for teachers becomes collaborative when it emphasizes active and interactive learning experiences through professional learning communities (Hunzicker, 2011). The teachers will have an opportunity to work with their peers to develop resources and to confirm their understanding of the content presented in the PD. They will also be involved with deep thinking through reflection. However, the collaboration that teachers may experience while engaged in the PD may be hard to maintain as teachers return to their daily responsibilities in the classroom. To foster a

continuous mindset of collaboration among the teachers, I suggest that program facilitators organize the workshop sessions so that it is job-embedded and they can provide refreshments throughout the school year. Educators should consider integrating job-embedded PD into the workday, consisting of teachers finding solutions to problems of practice (National Staff Development Council, 2010).

To encourage continuous collaboration, I will create a Google Classroom and ask the teachers to join to share their collaboration successes after returning to class. Furthermore, I will give the participants my e-mail address to keep communication open for any teachers who may have questions and need assistance from me to ensure the professional learning communities keep going throughout the school year. I would like to offer refresher PDs during the summer. It will be the same 3-Day workshop so that new teachers may also attend.

Recommendations for Alternative Approaches

Alternate Approaches to the Problem

In the previous section, I indicated that it would be difficult to determine if this project would sustain a collaborative culture of data use. Because of this limitation, I will need to provide a different approach to the problem and provide PD and collaboration opportunities for teachers who would like to continue engaging in professional learning communities with their peers. Collaborative opportunities other than a PD may include a lead teacher being responsible for managing the work of all group members. The lead teacher would ensure that the group meets regularly to conduct the necessary work and implement the PDSA in their work consistently. Another alternative approach would be

to use the PLC process to serve a framework for overseeing the work of the group members.

Alternative Definitions of the Problem

The problem that prompted this study was that teachers were not able to monitor student academic progress effectively using PDSA, a district prescribed data-driven model. I interviewed several teachers who were already familiar with using the PDSA and had at least 3 years of teaching experience in the district. The data that I obtained because of three forms of data collection indicated that the teachers wanted to participate in a collaborative, hands-on PD that they could use to analyze data from assessments. In the project I developed based on this study, I support the collaboration of teachers through common planning. By participating in this project's PD, teachers will have the opportunity to plan together and develop resources together that supports the PDSA. Some teachers may only take advantage of this opportunity to collaborate during the three PD days. They may not follow up with one another and continue the collaboration. Therefore, two alternative definitions of the problem for this study are as follows:

1. Reveal ways in which the instructional leader or experienced teachers can become leaders in leading a PD so that they continuously collaborate about data from assessments and plan together to develop effective lessons to improve student learning.

2. Reveal ways to create local networks of teacher who would like to lead PLCs and develop the Common Formative Assessment (CFA) annual calendar, PDSA forms, and data wall components to share online to assist teachers with

the effective use of the PDSA. Perhaps the leader can create a Google

Classroom each year and post the documents that the teachers will need. The

teachers will also use the Google classroom to submit their agenda and PLC

forms each time they meet for initial training and PLCs.

These alternative definitions of the problem align with the problem that prompted

this study because all the problem statements reveal how teachers can receive on-going

training and collaboration on the PDSA.

Alternate Solutions to the Local Problem

Teachers who work in schools where they do not have the opportunity to

collaborate and plan with their fellow teachers may benefit from alternate solutions. The

design of the alternate solutions may engage groups of teachers in PLCs. These teachers

may need to collaborate with others to strengthen their knowledge of the PDSA. The

collaboration meetings may also allow teachers an opportunity to review data, plan

lessons together, share their expertise, instructional strategies, and success stories.

Alternate solutions are a good way for the researcher to identify teachers' strengths in

their successful use of the PDSA.

Ways teachers can collaboratively plan. Teachers may feel more confident

about their effectiveness in the classroom when they are able to plan in collaborative

groups. In a collaborative school setting, leadership teams could develop schedules to

ensure that teachers have time to meet to plan and collaborate on a regular basis.

Teachers could meet bi-weekly to ensure they are covering the same content and to

reflect on the outcome of instructional strategies that they have implemented in their

classrooms. In addition, they could share results from CFA to reveal data that can help the teachers plan future instruction. The idea would be to identify various forms of common formative assessments, to share instructional strategies, and to highlight what strategies were successful. Furthermore, the teachers could determine areas of weakness in the lesson to adjust and refine accordingly. The collaboration meetings would not require the approval of the school administrator, but the school administrator may join the meetings at any time. The teachers would be required to submit the meeting agenda and minutes to provide administrators with feedback about the collaborative meetings. Ideally, this type of collaboration would foster a reciprocal agreement in the school and district about the positive impact of teachers using PLCs to consistently plan together.

At the school level, the teachers could conduct PLCs weekly to allow teachers time to share ideas about lesson planning, instructional strategies that they will use, activities that the students will do, study assessment results, and develop an action plan according to what the data revealed. Once teachers meet, the teachers may be required to submit a completed PLC form to confirm that they did the PDSA process with fidelity. Administrators could invite teachers to participate during their planning time on certain days to review assessments and work together on lessons. Schools can benefit from teacher collaboration that focuses on developing a PLC that will help improve teaching and learning.

Ways leadership teams can create local networks for teachers to share plans and collaborate online. Many schools and districts offer teachers the opportunity to post lessons online and to share their expertise. Teachers may be able to find such resources

on the district and school webpage, but they may not be able to meet with teachers

consistently at another school or other teachers at the same school. An alternative

solution to the problem could be to create pacing guides, assessment calendars,

assessments, and lesson plans that the teachers could obtain through e-mail or by creating

a school or district Google Classroom for teachers to submit these resources. Teachers

may also use Google Docs to plan lessons together by working on the document together

in real time. In addition, teachers could invite fellow teachers to meet online for

collaborative meetings by using Google Hangouts or Zoom video conferencing to discuss

PLC matters. To reflect on the success of their lesson implementation, teachers could also

engage in a blackboard discussion or a Padlet exercise. Finally, teachers could engage in

online learning through webinars that focus on data analysis and the PDSA. The alternate

solutions will allow the opportunity for teachers who want to collaborate and plan

together to interact without feeling overwhelmed when they cannot meet face-to-face.

Scholarship, Project Development and Evaluation, and Leadership and Change

As I researched ways in which teachers can use and analyze data to inform

instruction, I developed findings with teacher participants who were supportive of using

the PDSA to improve teaching and learning in the classroom. As a lead teacher, I have

witnessed other teachers implementing the PDSA in their classrooms to improve their

instructional strategies and to engage students in the data analysis process. Conversely, I

have also noticed some teachers not implementing the PDSA even though they had it

displayed on their boards.

My goal was to acquire an understanding of why teachers struggle with implementing the PDSA in their classroom with fidelity. I wanted to develop a project structure that would allow teachers to work together to analyze data and implement the PDSA in a way that would improve both teaching and learning. I also wanted to find out from teachers why they were having difficulties using the PDSA. I was eager to complete this research because I knew that the results would have an impact on teachers' perceptions of the PDSA and their successes with using it to improve instruction and student achievement.

As I gained experience and grew in this process as a scholar, I had to shift my mindset and learn to separate my opinions and biases. This was a challenge in the beginning because of my passion for analyzing data and because of the discipline required to ground myself in the research process. I had to discipline myself, be determined, and consistent to overcome my challenges. I knew the problem was significant, but I had to do research to confirm that other scholars support these ideas in their research. This process taught me to have an open mind and appreciate the previous work other scholars contributed to research. Bambrick-Santoyo (2010), Eaker and DuFour (2002), and Means et al. (2010) suggested ideas about collaborative planning, assessments, and the importance of data-driven instruction that inspired my scholarship throughout this study. I learned to become a more critical and reflective thinker about what I read.

Once I had selected the teacher participants for the data collection process, I was excited about beginning to collect the three forms of data. However, the process was not

as smooth as I would have liked. I anticipated the timeframe of 1 week for participants to volunteer for the study, but the process took longer than a week. After a few weeks, I was finally able to begin scheduling individual interviews and do an analysis of each teacher's data wall. During this data collection process, I also kept a reflective journal to help me understand the experiences and reflect on my work as a scholar.

After I finished my data collection and developed my findings, I focused on project development. My findings drove the project development, and the process allowed me to learn that teacher collaboration about data-driven instruction would make the greatest impact on student learning and teacher instruction. Developing PD sessions may help teachers to manage time to use and analyze data from an assessment and collaborate about effective instructional strategies that all teachers can use in class to increase student performance. In turn, teachers may have a positive impact on student achievement by helping colleagues develop their abilities to analyze data using the PDSA.

As a leader driven by using data to identify weaknesses and strengths, I found that by having an open-mind and growth mindset about the research process, the results, and the project, I could have a more positive impact on the teaching and learning process. I could offer participants more guidance on how to engage in collaborative team meetings in a systematic way so that they could review data from assessments, share instructional strategies, and spend time planning on how to improve instruction. Therefore, I credit my success as a researcher to the on-going learning throughout the research process.

Personal Learning Reflective Analysis

When I started the doctoral journey, I was excited and full of energy as I embarked on this new experience. I quickly realized that the process is very time-consuming, and it requires a lot of effort. Over time, I saw that it required a different type of thinking to complete the program successfully. I had to stop and regroup several times after determining that this was going to be the most challenging thing I have ever done. Initially, when I learned that this doctoral study would require me to do a project, I was apprehensive and frustrated because I felt it was just going to add unnecessary time for me to complete my doctoral degree. Conversely, as I grew as a scholar, I saw the importance of developing a project. I learned that I needed the project development, as it became part of the solution to the problem. Going through the process increased my expertise and prepared me to become more of a scholar.

Once I overcame my nervousness of interviewing the first participant, my skills and confidence grew. I reflected on the first interview experience, and it helped me to realize that it was a just a conversation for me to gain data and insight. I started approaching all other interviews as if they were interesting conversations with people experienced in using data walls. Through these conversations, I began to see that all teachers try to teach in ways that ensure students are learning, and they plan ways to adjust teaching if students are not learning.

This experience brought a lot of awareness to me about real-life experiences that people may possibly encounter. I started to notice experiences around me that made me view the world differently, wondering if people use the PDSA informally on a regular

basis to plan for improvement. For example, one day when I visited my doctor for an appointment, as I sat and waited I noticed that the doctor was going back and forth from a patient's room to his computer, which was in a central location. This location allowed me to observe his actions from the waiting room. After he went to type data into his computer, he went back to the patient's room with notes and an IPad. The doctor also did this when it was my turn to go in the room to see him. He came into the room to collect data from me, then he went to his computer to use and analyze the data that he gathered, and then he came back with an action plan, including prescription, home instructions, and a date to follow-up with me. I concluded that he was going through the PDSA cycle with each patient.

As a result, I learned that any professional field could modify the results of my study. I also learned that people could apply the PDSA in a personal way to improve goals and plans. I discovered this because as I tried to reach my goal of completing this doctoral study I had to use discipline. For example, at the beginning of each new semester, I wrote my semester plans by working through a PDSA cycle to reach the goals that I set. At times, I fell short, but when I did, I had to develop another plan and specify what I would do to reach my goal. I applied what I was learning in my own life while still facing the challenge of staying focused and grounded in my study. It was almost as if my mind had shifted to a new way of thinking and seeing experiences in the world. I have the drive to learn more about the influence of data analysis, and I anticipated what the data from my study would indicate upon analysis. I realized that although collecting this data is interesting, it is also time-consuming. However, I realized that if I focused on the data

collected within my study, I could use the results to expand my abilities and positively affect other well-researched projects in the future.

Growth as a Scholar

As I went through the process to pursue this doctoral degree, I realized that this part of my educational career is much different from all other courses I have taken. I learned things about the writing and research process that I would never have learned if I had not decided to become a doctoral student. In the past, I have been required to write using APA style. However, while writing my doctoral study, I learned the importance of using scholarly language and consistent document structures. I learned to write in a scholarly voice by using the precision of language and the economy of expression, which is a focus of APA writing. This process was very challenging, and it forced me to rise above my normal study habits so that I could self-direct my learning to acquire the skills needed. Along with the assistance of my Chair, I had to learn to diagnose my learning needs and rise to the level that he expected for writing. Directing my learning was so difficult to do at times, but the process was a great learning experience that helped me to grow as a scholar. My challenges taught me how to persevere when things get hard, and accept humility in the process. I am now able to empathize with any student who decides to embark on this educational journey. I will be able to share encouraging words and inspiration to help motivate them through the process. Although I have improved my scholarship, I still have so much to learn. This journey has prepared me to become a life-long learner and to continue to follow my path of becoming an advanced scholar.

I also learned from collecting data from my study. During the study process, I began to classify myself as a researcher. I noticed that I started to possess the qualities and mindset of other researchers. I started to look at my daily work on the research in an analytical and more systematic way. These qualities allowed me to identify the significance of how I collected the data. I identified specific findings by transcribing data from interviews and transcribing data from observing data walls. This was a tedious process of collecting many pages of data. I had to analyze all the data on each page, which led me to my findings. I focused close attention to my participants' expression and details of how they implement the PDSA in their classrooms. This helped me to identify the themes and patterns that emerged from their thoughts and words so that there would be no biases. As I analyzed the data, I found that by thoroughly analyzing teachers' experiences and perceptions I could yield important findings. I spent many long nights and very early mornings working, with the determination to become a more professional writer.

Growth as a Practitioner

My research for this study had a major influence on my growth as a practitioner. The most obvious and direct effect was in my teaching. My responsibilities include teaching students so that they can become proficient in state identified grade level standards. I immediately applied what I learned during my research for this study. I started to pay close attention to the type of assessments that I was administering to my students. I made it a point to give my students formative assessments weekly, and to set calendar dates to administer benchmark/interim assessments at the beginning of the year

to ensure that I do it. During my doctoral research, I learned that assessments are not for

only giving grades to students but they should guide teaching as well; therefore, I started

to apply that consistently. I learned to give assessments more frequently and to analyze

the data results to identify which students are proficient on standards and which were not

proficient. Once I analyzed the data, I used it to plan how I will re-teach or use the

assessment data to differentiate my teaching to address learning needs. I applied what I

have learned from my doctoral research to my professional responsibilities daily. It is

almost as if using and analyzing data to improve my instruction comes naturally. I also

support and encourage other teachers to use their data to make instructional changes so

that we may target our students' learning more efficiently. I now understand the teaching

profession more clearly than I did before I completed this study.

Another influence I noticed in my work with teachers in my school is the ability

to encourage collaboration amongst team members. As a lead teacher, I can pull the team

together to meet twice a month. I have been able to implement some of my research from

this study in my presentations during the meetings. The focus of our meetings recently

changes because I have been able to apply some of the knowledge I gained while doing

research. For example, in the past when the teachers and I met as a team we seemed to

always spend our time together talking about our students' behavior and going down the

list of what the child did, what the parents don't do, and a whole lot of irrelevant topics.

The topics have changed and the conversations are more meaningful because I always

create an agenda with topics related to assessments, teaching, and planning. In addition,

we now go over a list of norms before the meeting starts to ensure that we stick to the

agenda. If I had not learned about assessments and collaboration during my research then I would have been still doing things the old and comfortable way. Next year I am looking forward to introducing PLCs so that I can apply DuFour's four PLC questions to our collaboration time.

I have also been able to apply what I learned as a qualitative researcher in my professional and personal life. As I work on certain documents at work, I can take accurate notes due to my experience with field notes, and I now recognize the importance of using pseudonyms and respecting the privacy of my students. At home, I try to ask open-ended questions when I want to discuss important matters with my family members. If it were not for this doctoral experience, then I would not have learned that the open-ended questions prompt others to freely elaborate and provide more details. This works out well with my children because they often like to choose fixed responses such as yes or no to avoid talking. Now when I have both, professional and personal conversations, I patiently allow the other party to speak while I seek to understand by actively listening. I can discuss sensitive topics with more confidence while respecting the perspectives of others.

Growth as a Project Developer

In developing the project for this study, I wanted to be sure that it would address the research findings, but also be useful to others who may be interested in implementing the PD. I realized that the project would have the potential to be a valuable resource for many teachers so I knew before I started that I had to invest time and thought into it so that it would be of good quality. By creating a PD, I offered teachers a way to reflect on

their ability to analyze data and apply the results to teaching and learning. I included sessions in the PD that would allow time daily for reflection on how to strengthen their instruction. The sessions also offered time for teachers to collaborate as they review assessments and plan lessons. To accomplish this, I needed to reflect upon what the findings indicated was necessary for teachers to implement the PDSA effectively and with fidelity. I learned from the findings that teachers believe that the PDSA is an effective system, but the teachers need time to have on-going training for them to implement the PDSA.

I also developed a session during the 3-day PD for teachers to focus on creating their data wall frameworks. The reason for this work session was to help teachers be intentional and proactive about setting up data walls so that setting up data walls would not seem like just another daunting task on their long to-do list once school is in session. As I developed the project, I made setting up data walls an essential part of the work sessions because the research findings revealed that teachers thought the PDSA was time-consuming. I wanted to provide teachers with the opportunity to collaborate with other teachers who might have creative ideas about creating data walls.

Because I recognized that the participants in this project would need to engage in the hands-on activities, I created a project that would allow teachers to use their planning and instructional time appropriately. This project represented the chance to offer quality collaboration on teaching and learning for teachers that may not have had the chance to collaborate on a regular basis about using data to inform instruction. Being the project developer has helped me to grow in my ability to think of using the PDSA through the

lens of these teachers as I have learned to use this study's findings to frame the content of my PD project successfully.

Reflection on Importance of the Work

This study is important because the findings came from the perceptions of elementary and middle-level teachers about using and analyzing data to improve instruction. The participants in this study are certified teachers who have at least three years of teaching experience and who are familiar with the PDSA. Teachers with this level of experience with the PDSA shared their insights of the strengths and weaknesses in using the PDSA easily. This study is important because it may provide teachers with training to help implement the PDSA with fidelity so that the teachers can monitor student learning. Implementing the PDSA will get teachers in the habit of analyzing data to provide effective instruction that focuses on what students learned and not just on what the teacher taught (Bambrick-Santoyo, 2012). If this study can help teachers understand the importance of using data to improve instruction, of collaborating with colleagues to disaggregate data, and of engaging students in the data analysis process, then it can provide teachers with the guidance they need to help students improve their academic performance. If the study raises awareness of student progress monitoring, and teachers become dedicated to using assessment data to drive their instruction, then it will have a long-term effect on student achievement and teacher instruction at the local, state, and national levels. Monitoring student progress will help teachers gauge how close or far away, students are from meeting state and national standards. When educators help students meet the standards the state expects students to know in K-12 education, then the

students may be more successful in courses they will be required to take in higher education. Therefore, this work is important because prepared students will have more opportunities and greater options available to them after high school.

As I reflect upon the importance of this work, I realize how important data-driven instruction and collaborative planning is to the learning process. Looking at data consistently allows teachers to influence student learning daily by improving the quality of their instruction. The teacher training and collaboration from this study may not be limited to the local school building and district. After using and refining this PD workshop, it may be more likely for me to share broadly through presentations at conferences as well as through virtual communities such as blackboard discussions or even screencast document videos.

Allowing teachers time to reflect, plan, collaborate, and analyze data help the teachers improve student learning. Once the first group of teachers have attended this PD and provided feedback, facilitators may improve the workshop sessions and offer it to more teachers. This will enable other groups of teachers to attend and to benefit from the PD. Thus, this project, by engaging teachers in ongoing collaborative meetings, may sustain the data-driven practice. When I reflect upon the importance of this project, I realize its potential to a) impact the lives of students in school and beyond high school, b) change the way teachers view teaching and learning, c) improve the school culture, and d) engage teachers in meaningful professional learning communities.

Implications, Applications, and Directions for Future Research

This study adds to the literature of researchers about the importance of using data to improve instruction (Bambrick-Santoyo, 2010; Candal, 2016; Mandinach 2012; Marsh et al., 2015). Elementary and middle-level teachers' perceptions, insights, and challenges of using the PDSA helped me to obtain my findings. When I analyzed the data and revealed the three findings, I designed a PD to assist teachers who reported that they would like to engage in ongoing training on using the PDSA to analyze data.

Potential Impact of Social Change

When teachers put forth an effort to make a difference in the teaching and learning environment by improving their daily practice, there is a potential impact for social change. This study contributes to social change because it helps educators to reflect constantly on their teaching by looking at data to identify and address deficiencies in their instruction. As teachers recognize their ability to influence student learning, they become vehicles of social change. By working collaboratively with colleagues, teachers can share their expertise with others. The participants provided valuable information for other teachers that can continue beyond the local school. Because the information from the study can extend to others, another potential impact for social change may occur across geographic areas and through chains of teacher networks; effective instruction can positively impact students' lives significantly. Some of the applications can improve the way students engage in their learning processes. For example, student become engaged in learning opportunities when they do the following: (a) develop academic goals, (b) use data to measure progress, (c) use data notebooks, (d) collaborate with teachers to identify

strategies that best help them learn, or (e) learn to view grades to monitor their own learning.

The PD developed from these findings can be a direct link to help teachers improve their instruction and student learning, which in turn, will change the educational environment. As the participants receive the PD training, they will apply what they have learned in their classroom, and as a result, it will contribute to the positive change in their school culture. As a Walden student, I know the importance of influencing social change so the PD was designed to bring a major change to the learning community so that the change will positively impact student achievement and change the school culture. The current findings may inspire teachers to collaborate and become leaders of data analysis their learning communities. As a result, the PD may transform the teachers' day-to-day practice.

It was essential to create activities that would allow participants to reflect on their teaching and how to better monitor student learning as they collaborate with colleagues and share their expertise. Because of this, I focused on offering reflective time, work sessions, and collaborative planning activities during the PD. I also took into consideration that each participant in the PD would bring prior knowledge based on his or her experiences and insights about using the PDSA. Although I began the study with a focus on the problem of teachers not using the PDSA with fidelity, I gained so much more understanding from the study participants. The teachers' knowledge and insight helped to produce the information for this study.

Methodological, Theoretical, and Empirical Implications

This study has important methodological, theoretical and empirical implications because the problem that prompted the study focused on teachers struggling to implement the PDSA with fidelity. There is a need to address data-driven instruction, as this study revealed that there is a void in the way the district train teachers to use the district's prescribed data analysis system. The district's training need to better prepare teachers to use the PDSA to analyze data. Possible solutions to this problem emerged from the experiences and insights of elementary and middle-level teachers, supported by scholarly research. The methodology used in this study allowed me to communicate with elementary and middle-level teachers in individual interviews and during document observations. This dialog provided participants with multiple opportunities to reflect upon the questions that stemmed from my research questions and to offer their perceptions through two forms of data collection. The qualitative study design used for this study was the best methodology to gather teachers' insights and perceptions so that I could learn what participants believe they need so they could use and analyze data to inform instruction.

The conceptual framework of this study was based on Bambrick-Santoyo's principles that assessment, analysis, action, and culture vital to develop an environment of effective data-driven instruction (Bambrick-Santoyo, 2010). Mandinach's (2012) research further supported this because it revealed that teachers should analyze data from assessments and then act to modify instruction. DuFour (2004b) believed that a collaborative school culture could support data-driven instruction. Just as with other

professions, the field of education is constantly evolving. Therefore, teaching practices must also change. Plan, Do, Study, Act is a systematic process that users can apply in many areas to improve success in professional fields or workforce. My findings suggest that teachers find the PDSA effective and agree that it can improve student achievement if users attend proper training. The theoretical implications of this study include the idea that teachers should also use PDSA systematic process to improve their practice.

The empirical implication of this study suggests that teachers are experts in their professional field and they are very knowledgeable about their practice. Furthermore, researchers can determine this by carefully analyzing data, guided by a conceptual framework that focuses on a culture in which teachers use data to drive instruction. The data have indicated that teachers have strategies that they use in their classrooms to monitor student learning, but it may not support the district's prescribed system. As a result, the teachers are willing to learn how to implement the PDSA effectively to help their students increase their performance and to improve their instruction. To achieve their goals, teachers have found ways to collaborate with their colleagues to discuss effective data use strategies. The empirical implication of this study suggests, therefore, that additional studies that capture teachers' insights and experience may prove useful to teachers and to school systems that wish to improve teachers' use of data analysis. These studies could provide further examples of effective practices and skills that teachers can use as models for educational organizations that wish to support this type of professional learning.

Recommendations for Practice and or Future Research

The education field is full of opportunities for future research that focuses on capturing the expertise and experience of elementary and middle-level teachers. The findings of this study indicated that teachers use assessments to adjust instruction and that teachers would like to engage in initial and ongoing collaborative PDs on using the PDSA to analyze data. Additional studies that focus on effective use of assessments to analyze data may be useful to potential elementary and middle-level teachers. Assessments are critical to the data-driven process. Furthermore, research that focuses on engaging students in the data analysis process would contribute to the body of knowledge as well. When students use data from assessments to track their progress, it can enhance their motivation and performance. Teachers would benefit from teaching students to monitor their own progress because when students become aware of their performance, they may choose to take steps that may improve their learning, just as teachers work to improve their instruction.

Researchers should do additional research on how PLCs can help bridge the gap between data use and practice so that teachers can use the data to inform instruction (Marsh et al., 2015). This would be beneficial because teachers may be provided the time needed to use and analyze data and to collaborate on ways to improve teaching and learning. Finally, I recommend doing research about how teachers can increase collaboration about data and assessments using PLCs. Participants in this study consistently pointed out that they would like to strengthen school-wide data collaboration. Therefore, research that describes data revealing ways teachers can

collaborate on data analysis through professional learning communities would be significant.

Conclusion

Effective data-driven instruction involves analyzing data from assessments, responding to the data, and creating a culture in which data is often used (Bambrick-Santoyo, 2010). In this qualitative case study, I invited eight elementary and middle-level teachers to share their perceptions about using and analyzing data. As I gathered data and later analyzed them, I aimed to make sense of this phenomenon to understand how participants attributed meaning to it (Merriam, 2014). Teachers struggle with using data from assessments to inform instruction in many school districts across the nation (Marsh & Farrell, 2015; Means et al., 2011; Weiss, 2012). This study focused on ways that districts could improve teacher use and analysis of data.

The problem that prompted this study was elementary and middle-level teachers in a rural school district are not able to monitor student academic progress effectively using PDSA; a district prescribed data-driven model. When I collected and analyzed the data, I learned important lessons that participants shared about data analysis. I analyzed the data, guided by the three research questions, to uncover findings that described participants' perceptions of (a) analyzing data; (b) using assessments, and (c) PD opportunities. This study is important because it reveals teachers' perceptions of ways to strengthen their data-driven instruction to increase student performance and improve their teaching. Teachers who are aware of the effective impact instruction can have on student performance may be motivated to collaborate consistently with their colleagues to ensure

student learning takes place consistently. Professional development can provide teachers with the support they need to establish effective data use practices (Gerzon, 2015). In addition, the shared final products, such as the assessment calendars, participants' lesson plans, and PLC documents make an important contribution to the teaching field because they provide tangible evidence of ways that teachers can improve instruction and students' academic achievement by working collaboratively.

Data-driven instruction is a tool that teachers can use to ensure that every student achieves according to the academic standards that have been set. Data-driven practices can help teachers continuously evaluate teaching and learning. Using data from assessments that measures standards help teachers identify weak areas that teachers can quickly address by modifying their instruction promptly. Therefore, teachers must use data to meet the students where they are and help the students meet the standards that are required. When students meet standard requirements at each grade level standards, they have a better chance of succeeding in whatever college and career they may choose. Teachers who are motivated to ensure that they meet all students' learning needs create bright futures for their students and contribute to building productive citizens.

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Appendix A: The Project

Goals: In this 3-day PD, the trainer will provide the teachers with the knowledge and skills that will assist them in implementing the PDSA. Teachers will learn how to use the PSDSA model to collaborate with other teachers in PLCs and to engage students in the data analysis process. The trainer will use reflection, collaboration, and group work sessions to help teachers find ways to use data from assessments to drive instruction in ways that are timesaving, meaningful, and feasible in their educational settings.

Learning Outcomes: Teachers will identify effective protocols for working within collaborative teams. The teams will focus on increasing student performance by mapping, monitoring and analyzing data from student assessments. The trainer will provide the teams with data analysis forms to collect and organize assessment information. The teachers will analyze this organized information during the PLCs as they build instructional plans to address student weaknesses. Teachers will understand how to engage students successfully in the PDSA process during class. Teachers will engage in a self-assessment at will help them understand areas they need to improve in order to facilitate an effective PLC. At the end of the PD, teachers will develop essential data wall components and detail a process for engaging students in the data analysis after an assessment. At the end of the PD, participants will collaborate with their colleagues using a data to review assessments. There will also be designated stakeholders who will review the forms and data wall components at the end. These resources are the final products of the workshops

Target audience: Twenty elementary and middle-level teachers, who have volunteered to participate, will be the target audience for this project. On day three, the trainer will invite a group of volunteer administrators to participate in the development of data walls by giving feedback and providing some guidelines. On all three days, the trainer will invite instructional leaders to provide support, guidance, and feedback.

Components: The trainer organized the PD according to topics. The trainer will guide participants through the topics according to the following plan:

Day 1: Creating Collaborative Cultures for using Assessments

Day 2: PDSA for Collaborative Planning

Day 3: PDSA with Student Engagement

In order to plan the PD project, the literature review explains that elementary and middle-level teachers need to have a culture in which the teachers can collaborate to use the PDSA efficiently to inform instruction and monitor student academic progress. The trainer designed the project to assist teachers, to gain an overview of PLCs so that they can create a culture that allows time for using assessment data to plan together. Teachers will collaborate with their peers on using the PDSA on the first day. On the second and third day, teachers develop components of the PDSA so that the teachers can implement when the cycle when planning collaboratively. The last two days will also include hands-on activities that will allow teachers to create final products to solicit feedback. The three days of professional development will consist of collaboration and reflection from all participants as identified in the literature review.

The trainer organized activities with trainer notes for each day followed by PowerPoint presentations for each session. The presentations contain all the links, information, references, and logistics needed for the trainer to run the session. Participants will receive a hard copy of the presentation to follow and the facilitator will project an electronic version of the presentation on the Promethean board daily. The presentation has formative assessment products and reflections embedded. The presentation also embeds a link to an overall reflection at the end of the presentation on Day 3. The following charts outline the time, topic, and methods used each day of the professional development program:

Day 1: Creating Collaborative Cultures for Using Assessments

Time	Topic	Method
8:00–8:30	Sign-in, materials collection & seat assignment	Sign in at table and collect color coded name tags for Common Grade Level
8:30–9:00	Welcome, Ice-breaker, Overview	Group Discussion
9:00–9:30	Professional Norms	Trainer and Participants Discussion
9:30–10:30	What is a PLC?	Trainer Presents History of PLCs/PowerPoint
10:30–11:00	What road are you on as it relates to PLC?	Individual analysis, Pair-Share, Share-out
11:00–11:30	PLC in Action!	YouTube Video- *PLCs at Work: Analyzing and Using Formative Assessment Data* (CLAS Network, 2015) (What is something new from the video that will benefit you as you facilitate PLCs with other teachers?)
11:30–12:30	Lunch	On your own
12:30–1:30	Introduce Types of Assessments	Participants will read and discuss a handout
1:30–2:30	Create Common Formative Assessment Calendar	Grade Level Collaboration
2:30–3:00	Closing Session	Plus/Delta (+/Δ) PLC Evaluation Form- **Strengths** (What worked well?) **Improvements** (What changes are necessary?)

Day 2: PDSA for Collaborative Planning

Time	Topic	Method
8:00–8:30	Sign-in	Sign-in at Common Grade Level Table/Light refreshments
8:30–9:00	Welcome, Ice-Breaker	YouTube Video- *PLCs* (Brooks, 2016) Reminder Review of what a PLC is and is not/Group Discussion
9:00–9:15	Professional Norms	Trainer and Participants Discussion
9:15–9:45	What is Plan-Do-Study-Act?	Trainer Presents Overview of the PDSA cycle using PowerPoint
9:45–10:30	How can the PDSA cycle make PLCs more effective?	Read and discuss a Handout: *Overview of PDSA* (Murawski & Lochner, 2017)
10:30–11:30	Hands-on Collaborative PDSA Lesson Planning	Break-Out Session: Grade Level Collaborative Planning for later use
11:30–12:30	Lunch	On your own
12:30–1:30	Use a Recent Lesson to complete PDSA form	Jig-Saw Method to complete sample PDSA form used in PLC
1:30–2:30	PDSA Form Presentation	Present a modified PDSA Form for your needs
2:30–3:00	Closing Session	Plus/Delta (+/Δ) PLC Evaluation Form- **Strengths** (What worked?) **Improvements** (What changes are necessary?)

Day 3: PDSA with Student Engagement

Time	Topic	Method
8:00–8:15	Sign-in	Sign in at Common Grade Level table
8:30–9:00	Welcome, Ice-Breaker, Review	Group Discussion
9:00–9:15	Professional Norms	Trainer and Participants Discussion
9:15–10:00	How do I make learning transparent and communicate values and learning goals to all stakeholders?	PowerPoint Presentation on Essential Parts of Data Walls when using PDSA
10:00–11:30	What will I use to monitor the teaching and learning process in my class?	Break-Out Session: Teachers will engage in Hands-on activity to create essential parts of the Data Wall for their classroom
11:30–12:30	Lunch	On your own
12:30–1:30	How does a mission statement guide the teaching and learning process?	Presenter will model how to create a mission statement for a PLC
1:30–2:30	What will your mission statement be for your PLC/Class?	Teacher will complete a hands-on activity
2:30–3:00	Closing Session	Plus/Delta (+/Δ) PLC Evaluation Form- **Strengths** (What worked?) **Improvements** (What changes are necessary?)

Trainer Notes for Day 1

Creating a Collaborative Culture for Using Assessments

The trainer will attend to the following tasks at the beginning of the first session, before the presentation:

- Ensure all relevant information for participants is included in the PowerPoint presentations and the handouts for the participants. Some participants will prefer to work from their computers, and those participants will receive electronic copies of the PowerPoint presentations.

- Download video clips to the presentation computer and check speakers prior to the sessions.

- Review each slide before beginning the sessions to ensure the trainer has all materials in place.

- Distribute handouts, post-it sticky notes, composition notebooks (journals), and highlighters to each table in the room. Provide an additional table to organize materials the participants will use. Place a basket at the exit door to collect evaluation forms (exit tickets) and journals at the end of each session.

- Hang a sheet of sticky flipchart paper up in the back of the room for the Parking Lot.

- Be responsive to participants. Notice when they are restless and need a break. The trainer will address individual needs through a stretch break, bathroom break, or brain break. The facilitator will assign the breaks daily during the morning and afternoon sessions to be mindful of participants' individual needs.

- Welcome participants and introduce administrators who may have volunteered to attend the 3-day workshop. Explain that this 3-day PD opportunity will assist teachers in discovering how to create a collaborative culture of teachers who implement the PDSA to monitor student academic progress and plan instruction effectively. Explain that the first day will focus on creating a collaborative culture for using assessments and for making instructional decisions. Create a collaborative culture in which teachers can discuss and use

data from assessments to make instructional changes as needed. The trainer

will also explain that the subsequent days organize the PD sessions for

implementing the PDSA.

- Participants will discuss icebreaker question within their small grade-level

  group and then share-out with the whole team.

- The trainer will read the first pre-determined professional norm. These are

  norms that have been established before started the session. Then the group

  will do a round rally so that the participants voluntarily get to read the other

  statements. The round rally involves participants taking turns reading a

  statement as the trainer go around the room:

  - Start and end on time

  - Have an open mind for differences (respect others)

  - Actively listen and engage in activities

  - Speak from experience

  - Respond in a professional, non-judgmental manner

  - Politely and professionally address violations of the norms

  - Reflect. Engage. Create.

  - Keep cell phones on silent mode.

  - Address DuFour's 4 PLC Questions

- Ask the group members if they agree with these norms or if they would like to

  add additional norms. Modify the list as determined by participants by typing

  them in as I project them on the Promethean screen. Have the participants

agree to the professional norms and review them daily during the PowerPoint presentations.

- Inform participants that they should feel free to drink water and use the restroom as needed in addition to any breaks that seem necessary throughout the day.

- Inform participants that there will be a parking lot poster at the back of the room for them to post comments and queries. The trainer will address the posted information at the end of the workshop.

- Once the welcome/introductions are done, and the group establishes the norms, session one will start.

Sessions 1-4

- The trainer will be presenting for a portion of the sessions; the trainer will use the slides as a pre-populated framework on the Promethean board to help provide visual and vital information for participants to engage in the workshops.

  - **Session 1-** The trainer will give an overview of the study and its findings.

  - **Session 2-** Trainer will ask volunteers to read the Objective and Essential Question (EQ) aloud. In this session, participants will reflect on what a Professional Learning Community is, based on the participants' prior knowledge of PLCs and the research about PLCs. The trainer will allow participants to read the first slide to themselves and then do a pair-share of what PLCs are in their own words. Participants will write and then discuss the PLC self-reflection questions with a partner to analyze their knowledge

of PLCs. The trainer will use a metaphor to relate PLCs to the ease of access of roads with varied surfaces. The participants will also compare and contrast staff meetings and PLCs. Participants will volunteer to share-out their analysis. Next, the participants will view a video of *PLCs in Action,* then write down and post take-a-ways that they can implement in their own PLC.

- **Session 3** - This session will begin after lunch. The participants will discuss a Flashback from the morning session. The flashback will come from the sticky notes they posted about the video they viewed before lunch. The trainer will read some of the post-its aloud to the group, and the participants may discuss and elaborate on the statements. Next, the trainer will ask volunteers to read Objective and EQ for this session aloud. The participants will read an article entitled *Types of Assessments.* The trainer will assign each group a section (topic) to read using the Jigsaw method. The groups will prepare to share what they read about each type of assessment with the whole group. Each group will have a different type of assessment assigned to them to discuss. The trainer will modify the number of topics assigned based on the number of groups in attendance.

- Session 4- In this session, the participants will have a breakout work session to allow time for them to intentionally plan when they will administer common assessments during the school year. The trainer will pass out a copy of the *Assessment Calendar* template so that teachers can

work together to document dates for administering CFAs. The trainer will

share each team's calendar with administrators at the end of this 3-Day PD

so that the administrators may review and decide if they would like to use

any of the assessment calendars at the school level. Next, participants will

answer and discuss self- reflection questions about how they will use

common formative assessments to monitor teaching and learning in their

class.

- The trainer will distribute the evaluation form with two columns with Plus

  (What worked) and Delta (What changes are needed for improvement).

- PowerPoint presentation slides for Day 1; Sessions 1-4 are on the following

  pages of the appendix:

  - Session 1: Overview, page 186

  - Session 2: *What is a PLC?* page 188

  - Session 3: *Types of Assessments*, page 191

  - Session 4: *Common Formative Assessments Calendar* Planning,

    page 192

Presentation Handout, Day 1, Session 1

Perceptions of Teachers about Using and Analyzing data to Inform Instruction

Facilitator: Lateasha Harris, Ed.S.

What is the Problem?

The problem that prompted this study is elementary and middle school teachers in a rural school district in the southern United States are not able to effectively monitor student academic progress using Plan-Do-Study-Act (PDSA) cycle.

What is the Purpose?

The purpose of this qualitative case study is to identify elementary and middle-level teachers' perceptions about utilizing the PDSA model to analyze data in the classroom and how that data can inform classroom instruction.

Findings

- Teachers acknowledge that using the PDSA model for analyzing data is time-consuming, but it is an effective model to identify learning goals and plan future instruction.
- Teachers rely on assessment data to teach, re-teach, and differentiate instruction to address the needs of all students.
- Teachers would like to engage in initial training and ongoing, collaborative workshops on using the PDSA model to analyze data.

Overall Goals

- In this 3-Day PD, teachers will be provided with the knowledge and skills that will assist them in developing PLC protocols that will help them manage time to implement the PDSA model.
- Teachers will learn how to use the PDSA model as a framework to collaboratively analyze data from assessments to inform their instruction in class.

Daily Goals

- Day 1- Collaborative Culture: 1) Teacher will identify PLC protocols to help manage data analysis time. 2)Teachers will collaboratively create an assessment calendar that can be followed as a guide during PLCs to analyze assessment data to improve teaching and learning.
- Day 2- Collaborative Planning: 1) Teachers will engage in hands-on lesson planning that will incorporate the PDSA model. 2) Teachers will modify a PLC form that can be used in PLCs to analyze assessment data collaboratively to improve teaching and learning.
- Day 3- Student Engagement: Teachers will develop a data wall framework using the PDSA model that will engage their students in the data-analysis process to monitor learning.

GOAL

Presentation Handout, Day 1, Session 2

Welcome: 3 Day Collaborative Data Retreat

- Tell your name and content area.
- Share one ground/housekeeping rule for this PD.

Icebreaker Question:

- What is your philosophy of teaching and learning?

Learning Outcomes

By the end of this 3-Day PD, Participants will be able to:
- Identify effective protocols to facilitate a Professional Learning Community using data from assessments.
- Understand how to use the PDSA model when conducting PLCs.
- Understand how to engage students in the PDSA process using a data wall.

What to Expect at the End

- Teachers will create assessment calendars detailing when they will administer common formative assessments that can be used during PLCs.
- Teachers will collaboratively develop and share a lesson plan using the PDSA model, and modify the PLC form to fit their needs.
- Teachers will create a framework for data walls that can be used to engage students in the PDSA model.

Reflection

- Take a journal from the center of the table and write down what you expect to get out of this 3-Day PD.
- During this 3-Day PD, you will have ample time to reflect and share your thoughts and ideas.
- There will also be a Parking Lot posted each day for you to post comments and queries.

Developing a Game Plan for Data Collaboration

Facilitator: Lateasha Harris. Ed.S.

Day 1:
Creating a Collaborative Culture for Using Assessment data

Be sure to sign in and collect your grade-level badge for your seat assignment.

Pre-determined Professional Norms

What is appropriate and not appropriate for meetings? (5 mins)

- Honor the start and end times
- Have an open mind for differences
- Actively listen and engage; then speak from experience
- Respond in a professional, non-judgmental manner
- Politely and professionally address violations of the norms
- Reflect. Engage. Create.
- Keep cell phones on silent mode
- Address DuFours 4 PLC questions

Amended Professional Norms

What is appropriate and not appropriate for meetings? (5 mins)

Learning Outcomes

Objective
By the end of today's morning session, educators will be able to
build professional learning communities.

Essential Question
How can engaging in a PLC at my place of work enhance my instruction?

GOAL

What is a PLC?

- Professional Learning Communities (PLCs) are continuous, job-embedded professional development in which teachers are committed to collaborating in an ongoing process of collecting and acting on results to better serve students (DuFour, DuFour, & Eaker, 2008).

- To engage fully in the PLC process, members of a team must use data from student learning to inform and improve teaching (DuFour, 2015).

Self-Reflection

- What road are you on as it relates to PLC?

- How is a PLC different form a staff meeting or PD?

Write it in your journal and be prepared to share.

PLCs in Action!

What is something from the video that will benefit you as you facilitate PLCs with other teachers?

Use the sticky notes provided to post-it in the Parking Lot.

Video: PLCs in Action!

1. Before viewing the video, talk with the person sitting next to you about your understanding of a PLC?

2. After viewing the video, share something new from the video that will be beneficial as you participate in PLCs throughout the school year.

https://www.youtube.com/watch?v=buUaPW1uhSE

LUNCH on Your Own

ENJOY!!!

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Self-Reflection

- How will you use Common Formative Assessments to assess student learning in your class?
- How will you use Common Formative Assessments to monitor your teaching?

Write it in your journal and be prepared to share.

References

- CLAS Network (2015, November 30). *PLCs at Work: Analyzing and Using Formative Assessment Data* [Video file]. Retrieved from https://www.youtube.com/watch?v=buUaPW1uhSE
- DuFour, R., DuFour, R. and Eaker, R. (2008) *Revisiting professional learning communities: New insights for improving schools.* Solution Tree, Bloomington, IN.
- DuFour, R. (2015). How PLCs Do Data RIGHT. *Educational Leadership,*73(3), 22-26.
- Sparks, S. (2015). Types of Assessments: A Head to Head Comparison. *Education Week, 35*(12), Retrieved from https://www.edweek.org/ew/section/multimedia/types-of-assessments-a-head-to-head-comparison.html

Questions

Closing Evaluation

Plus- What went well during this session?

Delta- What changes are needed to improve this PD?

Be sure to complete the Plus/Delta Evaluation Form

Presentation Handout, Day 1, Session 3

Morning Flashback

Welcome Back!

Let's take few minutes to share-out some of the parking lot notes you posted before lunch as it relates to things you found useful from the PLC video.

Learning Outcomes

Objective

By the end of today's afternoon session, educators will be able to develop a common formative assessment calendar for the year.

Essential Question

How can I use Common Formative Assessments as part of the PLC process to monitor the teaching and learning process?

Types of Assessments

- Formative
- Interim/Benchmark
- Summative

https://www.edweek.org/ew/section/multimedia/types-of-assessments-a-head-to-head-comparison.html

Reading About Assessments: Jigsaw Method

Group 1 -Section: Formative Learning Assessment

Group 2 -Section: Formative Diagnostic Assessment

Group 3-Section: Benchmark/Interim Assessment

Group 4-Section: Summative Assessment

Presentation Handout, Day 1, Session 4

Handout, Day 1

Quarterly Assessment Calendar (2018-19)		
Dates:	**Assessment Name**	**Teacher Notes**
Week 1:	Pre-Test	
Week 2:	Unit 1:	Write in the name for each unit test.
Week 3:	Unit 2:	
Week 4:	Unit 3:	
Week 5:	Unit 4:	
Week 6:	Unit 5:	
Week 7:	Quarterly Common Formative Assessment (CFA) Unit 6:	
Week 8:	Re-teach Units 1-6	Mini-assessments daily to prepare for benchmark.
Week 9:	Benchmark Test/State Test	4th quarter will be the state test.

Trainer Notes for Day 2

PDSA for Collaborative Planning

Welcome participants to the second day of the PD that will focus on implementing the PDSA during a PLC when planning a lesson. Teachers will get background information on the PDSA and apply the steps in the model while collaborating with other teachers to plan a lesson. The teachers will work toward leaving with a concrete lesson plan to teach, re-teach, and differentiate instruction to address the needs of all students.

Notes to trainer for Sessions 1-5:

- Review the recorded professional norms from Day 1.

- Use the PowerPoint presentation as a framework for the day's activities.

- Download video clips to the presentation computer and check speakers before the sessions.

- Review each slide before beginning the sessions to ensure I have all materials in place.

- Distribute materials for each session, making sure to have journals, sticky notes, Popsicle sticks, chart paper, highlighters, handouts, and pencils available for each group.

- Place a tray at the front of the room to collect PDSA lesson plan products at the end of sessions.

- Hang a sheet of sticky flipchart paper up in the back of the room for the Parking Lot.

Sessions 1-5

- The trainer will be presenting for a portion of the sessions; the trainer will use the slides as a pre-populated framework on the Promethean board to help provide visual, vital information for participants to engage in the workshops.

  - **Session 1 -** The participants will discuss the icebreaker about monitoring student learning. Then the group will review norms and verbally agree. Next, the trainer will ask volunteers to read Objective and EQ aloud. The participants will view a video of what a PLC is and is not. After the video, the participants will do a Think-Pair-Share about non-negotiables when conducting PLCs.

  - **Session 2 -** The trainer will ask volunteers to read the Objective and EQ for this session aloud. Next, the trainer will present notes about PDSA and PLCs to transition into what PDSA is; breaking down each part of PDSA. After discussing each part of the PDSA, the participants will have reflection time to determine and write down if they are currently using any of the components in their class during a learning cycle.

  - **Session 3 –** The trainer will ask volunteer participants to read the Objective and EQ for this session aloud. The trainer will pass out a handout on the PDSA mode so that participants can read and discuss details about the PDSA a model using Socratic Seminar. The session will conclude with a Quick

Write in their journals about the PDSA, and I will use Popsicle sticks to call on participants to share-out their Quick Write randomly.

- **Session 4** - During this session, the participants, will breakout into groups with their common grade level or content and work collaboratively to plan a lesson using their school lesson plan while applying what they learned about the PDSA.

- **Session 5** - This session will begin with a flashback; participants will write, post, and share how effective their lesson planning session went before they went to lunch. The session will also require participants to evaluate the PDSA form provided by the trainer and modify it to fit their needs. Once their team does this, they will complete the PDSA form using the lesson plan they developed in the previous session. Finally, they will share-out and turn in their final product so that the trainer can turn it in to the administrator or instructional leader.

- The trainer will distribute the evaluation form with two columns with Plus (What worked) and Delta (What changes are needed for improvement).

- PowerPoint presentation slides for day 2; sessions 1-5 are on the following pages of the appendix:
  - Session 1: Icebreaker, Review Video, page 196
  - Session 2: What is Plan-Do-Study-Act? page 197
  - Session 3: Overview of PDSA, page 199
  - Session 4: PDSA Lesson Planning, page 199

o Session 5: Modified PDSA Form Share-out, page 200

Presentation Handout, Day 2, Session 1

Perceptions of Teachers about Using and Analyzing data to Inform Instruction
Facilitator: Lateasha Harris, Ed.S.

Day 2:
PDSA Collaborative Planning
Be sure to sign in and collect a Popsicle stick to write your name on and place it back in the cup.

Welcome
3-Day Collaborative Data Retreat

Icebreaker Question:
How do you monitor learning effectively in your class?

Professional Norms
What is appropriate and not appropriate for meetings? (5 mins)
- Honor the start and end times
- Have an open mind for differences
- Actively listen and engage; then speak from experience
- Respond in a professional, non-judgmental manner
- Politely and professionally address violations of the norms
- Reflect. Engage. Create.
- Keep cell phones on silent mode
- Address DuFours 4 PLC questions

Learning Outcomes
Objective
By the end of session one, educators will be able to identify what is and is not a PLC.

Essential Questions
1. What will you do to ensure that you are conducting a PLC and not a PD meeting?

GOAL

Video Review: *PLCs*
Reflect on what a PLC should look like in your school?

Think-Pair-Share Reflection
What is one non-negotiable from the video that you will use in your PLCs?

What is a "No-No" from the video that you will keep out of your PLCs?

Presentation Handout, Day 2, Session 2

Learning Outcomes

Objective

By the end of session two, educators will understand components of the PDSA model to monitor teaching and learning.

Essential Questions

1. What system do you have in place to monitor student learning and teacher instruction?

G⊙AL

Plan-Do-Study-Act (PDSA)

PDSA and PLCs

- PDSA can be used as a framework for conducting PLCs.
- PDSA establishes a structure for supporting DuFours PLC questions in a systematic way.
- PDSA can be used to plan thorough lessons during PLCs.
- PDSA can be used to analyze assessment results during PLCs.

What is Plan-Do-Study-Act (PDSA)?

- PDSA is a four-step cycle that teachers can use to ensure continuous improvement in the classroom. It has been proven by research to be a best strategy.
- It is also a strategy that collaborative groups can use to identify goals, monitor progress, and make timely changes when expected results are not achieved.

Plan

- *What do we want our students to Learn?*
- **Identify and clarify goals.**
- **Standards/Objectives**

Think: What do you want your students to learn in the next 5-10 days?

Plan: Journal Reflection

- Unpack your standards and identify the knowledge or skills for the next learning cycle in your class.
- These are your objectives; make them kid-friendly to share with your students. Perhaps, as *I Can* statements.

Do

- **How will we teach them what they need to learn?**
- **Determine instructional strategies to help students meet objectives.**
- **Instructional plan /Agenda**

Think: How will you teach to ensure students learn the objectives?

Do: Journal Reflection

- Look at your standards and be specific about the teacher and student role in order for students to meet the objectives.
- List what activities the teacher will do.
- List what activities the student will do.

Study

- How will we know they have learned it?
- Analyze data from assessments (individual student and class)
- Percent of objectives mastered and not mastered
- Student progress monitoring

Think: What does the data from assessments tell about how well your instructional strategies work?

Study: Journal Reflection

- Explain what data from assessments in your class is used to determine what students have or have not learned.

*Be prepared to share-out; popsicle pull!

Act

- What will we do when students learn? What will you do when struggle to learn?
- Enrichment (advanced students); Intervention (struggling students)
- Action Steps

Think: Did the results show the change you wanted or is there room for improvement?

Act: Journal Reflection

- What are your next action steps?
- What will the teacher and students do differently in the next learning cycle?

*The PDSA cycle starts over again.

Presentation Handout, Day 2, Session 3

Learning Outcomes

Objective

By the end of session three, educators will be able to identify components of the PDSA model.

Essential Questions
1. How can the PDSA cycle make PLCs more effective?

GOAL

Overview of PDSA

- PDSA is a cycle so it never ends; it is not a list of steps.
- A group may start by planning a lesson or they may choose to start by studying data. Since it is continuous, there is no set starting point.

Hand-Out: *Overview of PDSA*

Socratic Seminar 3-2-1

- Read section one and discuss with 3 people.
- Read section two and discuss with 2 people.
- Read that last section and discuss with 1 person.

Hand-Out: *Overview of PDSA*

Reflection:
- Take two minutes to complete a Quick-write about the PDSA model.

Presentation Handout, Day 2, Session 4

Learning Outcomes

Objective

By the end of session four, educators will be able to plan a lesson collaboratively by reflecting on the PDSA model.

Essential Questions

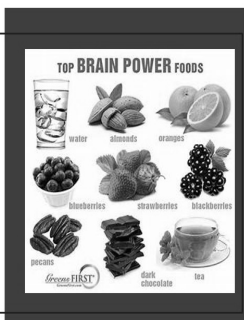1. How can planning with your common team members make your lesson more effective?

GOAL

Break-out Session

Task- You and your common team members will use this time to plan your next learning cycle using your school lesson plan template.

*Consider what you have learned about PDSA as you plan.

LUNCH on Your Own

ENJOY!!!

TOP **BRAIN POWER** FOODS

water   almonds   oranges

blueberries   strawberries   blackberries

pecans   dark chocolate   tea

Greens FIRST

Presentation Handout, Day 2, Session 5

Morning Flashback

Welcome Back!

Let's take few minutes to post a note in the parking lot about how effective it was to create a lesson plan by collaborating with your team this morning.

Learning Outcomes

Objective

By the end of session five, educators will be able to complete PLC forms using the PDSA model.

Essential Questions

1. How can I modify the PDSA form to hold me accountable for the teaching and learning process in each PLC?

GOAL

Building PLCs

- Now that you have seen what a PLC may look like. Remember, one of the most important resource to have is a way to document your collaborative planning.
- I have created a PLC form that I find useful to use during Collaborative planning.
- Now we will use a Jigsaw method to go over each part of the form.
- Break-out into your grade-level/ content-level teams

Instructions:

- Your group will read the title and discuss ways to complete that section during a PLC.
- You may do research and find examples.
- Each group will share out findings.

Completing a PLC Form- Jigsaw Method

Group 1: Section entitled S.M.A.R.T Goals

Group 2: Section entitled Plan; Do

Group 3: Section entitled Study; Act

Group 4: Section entitled Reflection; Checklist

Trainer: All other sections not assigned

Break-out Session

Task- You and your common team members will use this time to modify parts of the PLC form provided by me so that it fits the needs of your school culture. Remember, you must always have a PLC that focuses on the 4 PLC Essential Questions.

References

- DuFour, R., DuFour R., Eaker, R., Many, T., & Mattos, M. (2016). *Learning by doing: A handbook for professional learning communities at work.* Bloomington IN: Solution Tree.
- Jim Shipley & Associates. (2012). *Continuous classroom improvement: First steps in using a systems approach to improve learning results.* Retrieved from http://www.jimshipley.net/materials/continuous-classroom-improvement-3rd-edition/
- Murawski, W. W., & Lochner, W. W. (2017). *Beyond Co-Teaching Basics: A Data-Driven, No-Fail Model for Continuous Improvement.* Alexandria, VA: ASCD

Questions

Closing Evaluation

Be sure to complete the Plus/Delta Evaluation Form

Plus- What went well during this session?

Delta- What changes are needed to improve this session?

Handout, Day 2

Game Plan for Using Data to Improve Teaching and Learning	**4 PLC Essential Questions:**
	What do we want our students to learn? -Plan
	How will we teach them what they need to learn? -Do
	How will we know when they have learned it? Study
	What will we do when students learn or struggle to learn? -Act

Common Team Name:	**Date:**
COLLABORATIVE TEAM MEMBERS	**ROLES/RESPONSIBILITIES**
	Facilitator
	Timekeeper
	Recorder
	Norms Identifier

Agenda	
Task	**Time**
• Review Agenda	• 5 minutes ____:____
• Review Norms	• 5 minutes ____:____
• Complete PDSA process	• 40 minutes ____:____
• Review Checklist	• 5 minutes ____:____
• Closure	• 5 minutes ____:____

S.M.A.R.T Goals
Quarter: **Year:**   **School-wide:**

Quarterly Assessment Calendar (2018-19)		
Dates:	**Assessment Name**	**Teacher Notes**
Week 1:	Pre-Test	
Week 2:	Unit 1:	Write in the name for each unit test.
Week 3:	Unit 2:	
Week 4:	Unit 3:	
Week 5:	Unit 4:	
Week 6:	Unit 5:	
Week 7:	Quarterly Common Formative Assessment (CFA) Unit 6:	
Week 8:	Re-teach Units 1-6	Mini-assessments daily to prepare for benchmark.
Week 9:	Benchmark Test/State Test	4th quarter will be the state test.
Plan-Do-Study-Act (PDSA)		
Plan What do we want our students to learn? **Standards/Objectives**	
Do How will we teach them what they need to learn? **Instructional strategies (IS) to help students meet objectives**	
Study How will we know they have learned it? **Identify data from CFA- percent mastery/not mastered**	

Act What will we do when students learn or struggle to learn? **Action Steps based on data-Intervention/Enrichment**	

Reflection

Checklist of Things Covered

____ Read the Agenda   ____ Created Common Formative Assessment

____ Reviewed the Norms   ____ Reviewed Data from previous assessment

____ Reviewed the Standard/Goals   ____ Planned Differentiated Instructional strategies

____ Discussed Intervention and Enrichment   ____ Wrote reflection

Next Meeting Date: _____

Things to Bring to Next Meeting:

_____

Trainer Notes for Day 3

PDSA with Student Engagement

Welcome participants to the third day of the PD that will focus on implementing the PDSA during in class when reviewing data with students. Teachers will get background information on data walls and can prepare essential parts of the data wall so that the teacher can display the labels in their classrooms. The teachers will have time during this session to work on the labels and components that are necessary for their data wall.

Notes to trainer for Sessions 1-2:

- Review the professional norms that were recorded on Day 1.

- Use the PowerPoint presentation as a framework for the day's activities.

- Review each slide before beginning the sessions to ensure I have all materials in place.

- Distribute materials for each session, making sure to have journals, sticky notes, Popsicle sticks, chart paper, highlighters, handouts, portable laminators, and pencils available for each group.

- Place a tray at the front of the room to collect PDSA lesson plan products at the end of sessions.

- Hang a sheet of sticky flipchart paper up in the back of the room for the Parking Lot.

Sessions 1-2

- The trainer will be presenting for a portion of the sessions; the trainer will use the slides as a pre-populated framework on the Promethean board to help provide visual, vital information for participants to engage in the workshops.

  - **Session 1-** The participants will discuss the icebreaker about using data walls in the classroom. Then the group will review norms and verbally agree. Next, the trainer will ask volunteers to read Objective and EQ aloud. The participants will read and discuss PP notes about components of a data. Then the trainer will provide the participants will be provide with handouts and materials so that they can create essential data wall labels.

  - **Session 2-** This session will begin with a flashback from the morning session that required them to develop components of their data wall. The participants will do a journal entry explaining how they plan to use the data walls weekly in their classrooms. The participants will then share with their elbow partners. Next, the trainer will ask volunteers to read the Objective and EQ for this session aloud. Next, the trainer will present notes about mission statements, and then the trainer will model various ways to create mission statements. The trainer will allow time for the participants to evaluate and discuss the two options presented for developing a mission statement. Then, the participants will have a working session in which they will create a mission statement that they will use to guide the teachers' PLCs or a classroom mission that the

teacher may share with their students when they return to class and display the mission statements on their classroom data walls.

- The trainer will distribute the evaluation form with two columns with Plus (What worked) and Delta (What changes are needed for improvement).

- PowerPoint presentation slides are found for day 1, sessions 1-2 on the following pages of the appendix:

  o Session 1: Developing Data Walls, page 208

  o Session 2: Creating Mission Statements, page 210

Presentation Handout, Day 3, Session 1

Data

Teachers use data from assessments in many ways:

➢ to plan lessons
➢ to modify instruction
➢ to differentiate instruction to meet the needs of all students
➢ to create Response to Intervention (Rti) Plans , etc.

Data Walls

Teachers can use Data walls as a focal point to:

➢post data on progress towards mastering academic standards
➢share data with students, parents, and other stakeholders
➢project learning goals
➢promote student Learning
➢improve teaching
➢promote healthy competition

Essential Labels for Data Walls

➢Assessment Results

➢ S.M.A.R.T. Goals

➢ Plan, Do, Study, Act (Continuous Improvement Model)

➢Classroom Mission Statement

Classroom Mission Statement

Classroom mission statements can be co-created by teachers and students.

*We will discuss this in more details during the next session.

Assessment Results

➢ Assessment results can be displayed on data walls using charts, tables, graphs, etc.
➢ Be sure to remember the Family Educational Rights and Privacy Act (FERPA) when posting student data. *DO NOT OPENLY DISPLAY INDVIDUAL STUDENT NAMES AND SCORES*

S.M.A.R.T. Goals

Specific	Who (Students)- Is the goal clear?
Measurable	What (%) - Is the goal quantitative?
Attainable	How (Strategies)- Is the goal realistic?
Results-Oriented	Evidence - What assessment is the goal assigned?
Time bound	Timeframe- What is the specified time to achieve the goal? ?

Plan, Do, Study, Act Display Exemplar
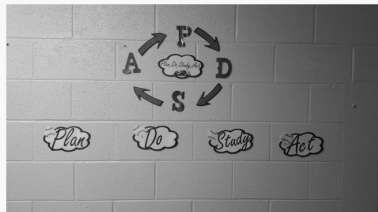
Break-Out Session

Use this time to create the essential data wall labels that you will use on your data wall when you return to class.
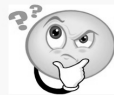
Materials will be provided for each group.

LUNCH on Your Own

ENJOY!!!

TOP **BRAIN POWER** FOODS

water almonds oranges

blueberries strawberries blackberries

pecans dark chocolate tea

Greens FIRST

Presentation Handout, Day 3, Session 2

Morning Flashback

Reflection

Write a journal entry explaining how you will use your data wall weekly in class with your students.

*Be prepared to share with your elbow partner.

Learning Outcomes

Objective:

By the end of session two, educators will be able to create mission statements for their classroom data walls.

Essential Question:

How does a mission statement bring focus to the teaching and learning process?

GOAL

Questions to Ponder when Developing a Mission Statement

- 1. **WHO-** Who are we? What is our classroom like?
- 2. **WHAT-** What do we want to accomplish? What is our purpose together?
- 3. **HOW-** How are we going to accomplish it?
- 4. **WHY-** Why do we want to accomplish it?

Considerations for Mission Statements

- It provides a clear purpose and direction.
- It aligns to the district and school's mission
- Language is student friendly
- It communicates what is valued in your classroom
- It is embedded into the day to day learning of the entire class

Considerations for Mission Statements

- It allows everyone to review responsibilities and values using a common language daily.
- Students, as well as teachers are able to create a clear focus for who they are, who they strive to be, and what actions need to be taken in order to reach their goal(s).

Model: Creating a Mission Statement for PLCs

Option 1: I have developed a mission statement to get your buy-in.

Please sign the mission statement to show that you support the mission presented. By signing you agree to bring the mission to life daily.

Guided: Analyzing Mission Statements

Look at the mission statement I have developed and let's identify the following from the mission statement:

- Who?
- What?
- How?
- Why?

Sample Professional Learning Community Mission Statement

The mission of XXX Professional Learning Community is to provide teachers with time to collaborate and use data to improve teaching and learning through common planning time in order to become a data-driven school

Collaborate: Compare and Contrast the Two Missions

Your School Mission Statement	Your District Mission Statement

Check For Understanding:

Let's pick out the
~ Who? What? How? Why?
for each one of the following:

School   District

Model: Creating a Mission Statement for PLCs

Option 2: What do you think can be the mission of your Professional Learning Communities?
- Get with your common grade/content level team.
- Each person in your group will write a word that best describes the expectations for a clear mission for your PLCs.
- When I call for time-up…

Model: Creating a Mission Statement for PLCs

- Write a sentence using each person's word to create a mission statement for your PLC and post it on the flipchart entitled "Mission Statement".

- We will share the post-its aloud and identify essential parts needed to make it appropriate to be a mission statement.

Tying it Together

- Mission statements can be pre-developed by teachers, and the teacher may present it to the students for buy-in. Be sure to get input to make modifications before having students sign the mission statement in agreement.
- Mission statements can also be developed using an activity that involves the students in the process from beginning to end.

Reflection

- Choose one of the mission statements shared that you like the most and tell why you chose it.
- Next, write down the who, what, how, and why

Remember

* There is a difference between writing and living a mission.

* Your colleagues, students and you must take meaningful steps to bring the mission to life.

References

- Boston Plan for Excellence (2011). *Making Data Public* Retrieved from http://www.bpe.org/files/MakingDataPublicExamples.pdf
- DuFour, R., DuFour, R. and Eaker, R. (2008) *Revisiting professional learning communities: New insights for improving schools*. Solution Tree, Bloomington, IN.
- DuFour, R., DuFour R., Eaker, R., Many, T., & Mattos, M. (2016). *Learning by doing: A handbook for professional learning communities at work*. Bloomington IN: Solution Tree.
- Classroom Mission Statement (N.D) Retrieved from http://www.dunlapcusd.net/CI/Pages/ClassroomMissionStatement.aspx

Questions

Summative Evaluation

*Thank you so much for your time and attendance to this 3-Day workshop.

*Be sure to complete the closing survey to share thoughts, suggestions, and improvements.

The following summative evaluation questions will be included at the end of the 3-day workshop:

1. Did the presenter appear to be knowledgeable of the content presented?

2. Was the presented information relevant to instruction?

3. Do you feel you learned enough to implement the information from this PD

   immediately when you return to your classroom?

4. Explain what has been the most useful information you obtained during this

   PD session.

5. How will you use PLCs to enhance your instruction in your classroom?

6. How do you think the PDSA will influence student learning?

7. What recommendations do you have to improve this 3-day workshop?

Appendix B: Teacher Invitation Letter

Dear Teachers,

My name is Lateasha M. Harris, a doctoral student at Walden University. I am conducting a study on perceptions of school teachers about using and analyzing data to inform instruction. The purpose of this qualitative case study is to identify elementary and middle-level teachers' perceptions about utilizing the PDSA model to analyze data in the classroom and how that data can inform classroom instruction. I am inviting teachers who are familiar with the PDSA model, who have at least three years of teaching experience, and who teach grades three through nine to be in the study. If you agree to be in this study, you will be asked to participate in an interview consisting of 11 questions and to allow me to observe, make notations about your data wall, and ask four questions regarding how you use the data wall during instructional periods.

Upon your request, I will conduct a brief informational meeting if you would like more information about the study. The requirements of the study will be explained in more details at that time. Your participation will be completely voluntary and you will not be compensated for participating in this study. Any information you provide will be kept confidential. Your personal information will not be shared with anyone at any time. If you decide, after the study begins, that you no longer want to participate, you may withdraw from the study at any time. If you choose to participate in this study, please read the attached Informed Consent Agreement and submit it to me or respond with an e-mail acknowledging and accepting the terms of the agreement by writing the words, "I consent".

If you would like to participate and/or have any questions, please do not hesitate to e-mail me at xxxxx@xxxxxx or call me at xxx-xxx-xxxx.

Thank you,

Lateasha M. Harris, Ed.S.

Appendix C: Interview Protocol

Teacher: _____   Grade Level: _____
Date: _____   Time: _____

Interviewer: Lateasha Harris

Title of Study: Perceptions of Teachers about Using and Analyzing Data to Inform Instruction

Good afternoon. I appreciate your time and your willingness to allow me to interview you. This interview will allow me to gather information related to my doctoral study. I selected you because you are a participant in this study and your experiences and perception are valuable. The topic is about how schoolteachers use and analyze data to inform instruction. Participation in this study is strictly voluntary. The responses I receive from this interview will in confidentiality. This interview will last 45 – 60 minutes and with your permission, I will record it. Recording the interview is to ensure that I can capture accurate responses during the conversation. Please attempt to speak loud and clear when you speak. Do you have any questions for me before I start the voice recorder?

RQ1: What are elementary and middle-level teachers' perceptions about utilizing the PDSA for analyzing data in the classroom?

The following questions are derived from research question 1:

1. How is do you use and analyze data when teaching?

   Probe: Would you please share the specific steps you use when you use and analyze data in your classroom?

2. How would you describe the process of the PDSA?

   Probe: How do you feel about implementing it in your classroom?

3. When using the PDSA, what specific approaches have you used to engage students successfully?

Probe: Do you know of approaches used by other teachers?

4. What obstacles have you encountered when going through the PDSA?

   Probe: Can you give an example of a time it was challenging to use in your

   class?

5. How have you overcome the obstacles you encountered when using the

   PDSA?

RQ2: How do elementary and middle-level teachers use assessment data to

inform classroom instruction?

The following questions are derived from research question 2:

6. After an assessment is given, how do you use the data from assessments to

   determine your teaching strategies in class?

   Probe: After giving a classroom assessment, how do you determine your

   instructional strategies?

   Probe: After administering a benchmark assessment, how do you determine

   your instructional strategies?

   Probe: After students have taken the state assessment, how do you determine

   your instructional strategies?

7. How do you plan instruction after giving an assessment?

   Probe: After giving a classroom assessment, how do you use it to plan

   instruction?

   Probe: After administering a benchmark assessment, how do you use it to plan

   instruction?

Probe: After students have taken the state assessment, how do you use it to plan instruction?

8. How do you address the needs of all your students after looking at data from assessments?

RQ3: What professional development support can help elementary and middle-level teachers to utilize analyzed data to inform classroom instruction?

The following questions are derived from research question 3:

9. What kind of professional development session about data analysis will be most helpful to you?

10. Do you think all teachers need professional development on the PDSA?

Probe: Why or why not?

Probe: How do you feel about your own ability to use PDSA?

11. What kind of professional development do you think you need to help you use and analyze data to inform instruction?

Probe: What do you think leaders need to do for that to happen?

Probe: Do you think other teachers need training on PDSA?

Appendix D: Document Analysis Form

Teacher_____ Subject/Period_____

Date/Time_____ Observer <u>Lateasha Harris</u>

The purpose of this document analysis will allow me to gather information related to my doctoral study topic of how schoolteachers use and analyze data to inform instruction. Participation in this study is strictly voluntary. I will conduct an observation of each participant's data wall. I will communicate with the teachers through e-mail to determine the date on which I can observe the teacher's data walls to see how the teachers created it and ask the teachers questions about how the teachers use the data wall to make it meaningful when providing students with instruction. I will provide a check mark next to the steps I see and provide verbatim language about how teachers use each step of PDSA. The document analysis will last 30 minutes. Thank you for your participation.

Data Wall Document Analysis Field Notes

Setting: Classroom
Teacher:
Observer: Lateasha M. Harris
Role of Observer: Researcher/ Data Collector
Date: **Time:**
Length of Observation:

Plan – Do- Study-Act Process on Data Wall	Is there evidence of this step? (Provide a check mark)	Notes on how teachers use the data walls during each step
1. **Plan-** Teacher lesson plan posted in a conspicuous place; learning objective displayed		
2. **Do-** What the teacher/student will do is posted		
3. **Study-** Current State Test results posted <u>or</u> Benchmark results posted <u>or</u> Teacher assessment results posted		
4. **Act-** New action plan (or steps) posted for the next cycle of learning		
Reflective Notes:		

1) How do you discuss the objective or learning target during instruction?

2) Do you discuss and engage the students in identifying high-yield strategies that will help them reach the learning target/objectives?

3) How do you engage students in the assessment results?

4) What discussion do you have with students about ways to improve during the next learning cycle?