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Instructional Leadership of Elementary School Principals Regarding Proficiency in Mathematics

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Walden University

College of Education

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Melvinia L. Robinson

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Walden University

2020

Abstract

Instructional Leadership of Elementary School Principals Regarding Proficiency in

Mathematics

by

Melvinia L. Robinson

ME, Tarleton State University, 2007

BA, University of North Texas, 2001

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Walden University

October 2020

Abstract

Elementary school principals, as instructional leaders, are critical to improving mathematics proficiency. The research problem was that elementary school principals are inconsistently applying instructional leadership to support mathematics teachers' efforts to improve students' proficiency. The purpose of this qualitative case study was to understand how elementary school principals apply instructional leadership to support mathematics teachers in their efforts to improve student proficiency in mathematics. The conceptual framework was the instructional leadership model of Hallinger and Murphy, which defines three main dimensions of instructional leadership: (a) the school mission, (b) the instructional program, and (c) the school climate. The research question was how elementary school principals apply instructional leadership to support mathematics teachers to improve student proficiency in mathematics. The participants were 12 elementary school principals who were purposefully selected. Data were collected via semistructured interviews via Zoom using an interview protocol. Thematic analysis was used to analyze the data. The themes revealed that principals should set goals based on student achievement while fostering communication with all stakeholders. The themes are embedded in the job functions within instructional leadership's three dimensions. Implications for positive social change include providing new information on how school principals can apply instructional leadership practices to better support mathematics teachers' work with students. These efforts may help students to improve their proficiency in mathematics and graduate from school.

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Dedication

I dedicate this dissertation to my four children, Hannah, Toni, Devyn, and Damon; a new legacy awaits you. I am grateful to my Lord and savior for the plans He had for me and to my husband for his support.

Acknowledgments

I would like to thank my committee chair, Dr. Peter Kiriakidis, for his support and feedback. I would also like to acknowledge my family, friends, and church family for their continued support and prayers.

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Chapter 1: Introduction to the Study

School principals set the stage and vision for the whole school. Principals are responsible for ensuring that instruction is occurring in each classroom and maintaining a positive learning environment. Teachers are responsible for educating the students in their classroom, whereas principals are responsible for all students within the school; thus, the influence from increasing principal quality surpasses the value of increasing a single teacher's quality (Hitt & Tucker, 2016). Therefore, this study's focus was on the influence a principal has on students' academic achievement, particularly mathematics achievement.

School principals make instructional leadership decisions based on their educational backgrounds and experiences. Principals with knowledge of mathematics, for instance, have a deeper understanding of the subject matter and question teachers on teaching and learning (Steele, Johnson, Otten, Herbel-Eisenmann, & Carver, 2015). Without a mathematical background, principals base their feedback on best practices and student characteristics (Steele et al., 2015). Lockmiller (2016) observed that leadership content knowledge (LCK) is the missing component in instructional leadership analysis. LCK is the blend of subject matter knowledge and instructional leadership practices. What is not clear is what leadership instructional practices principals with a math background use that others could benefit from knowing.

According to the National Assessment of Educational Progress (NAEP, 2017), the average Grade 4 math assessment score has not been measurably different in the past decade. I sought to understand whether elementary school principals' instructional

leadership and content knowledge improved proficiency in mathematics. The findings may provide school principals with new information on applying instructional leadership practices to better support mathematics teachers. Implications for positive social change include improving students' mathematics proficiency and likelihood of graduating from school.

In Chapter 1, I provide background information on principals' instructional leadership and student achievement. I also present the problem statement, purpose, and research question and describe the conceptual framework and nature of the study. The construct used to understand how principals apply instructional leadership with a focus on mathematics proficiency from state standardized scores and create the interview protocol was instructional leadership by Hallinger and Murphy (1985). The research question concerned how elementary school principals apply instructional leadership to support math teachers' efforts to improve students' proficiency in math. The methodology for this study was a qualitative case study. I conducted semistructured face-to-face interviews with 12 elementary principals via the video conferencing platform Zoom. The assumptions, scope and delimitations, limitations, and significance of this study are also addressed in the chapter.

Background

Principals balance the three dimensions of instructional leadership, outline the school mission, oversee the curriculum and instructional programs, and stimulate a positive learning environment at high levels to increase student achievement. Effective principals build a solid foundation as instructional leaders, even with little time in the

classroom (Mazzoni, 2017). Scholars have indicated that when teachers' perceptions of leadership are high, student performance is high (Mackey, 2016; Martin, 2018; Nguyen, Hallinger, & Chen, 2018). Teachers place the most merit in principals who protect classroom instructional time (Brown, 2016; Cansoy, Polatcan, & Kılinc, 2018; Davis & Boudreaux, 2019). However, some principals do not have a clear understanding of instructional leadership or how to manage instructional programs (Kalman & Mustafa, 2016; Manaseh, 2016); rather, they see themselves as facilitators of the concept (Campbell, Chaseling, Boyd, & Shipway, 2019). To implement instructional leadership, principals must have an understanding of how to manage instructional programs.

Federal and state policy has emphasized the shift of U.S. principals as managers of schools to instructional leaders focused on student achievement. Supervising and evaluating instruction is a direct activity of instructional leadership (Hallinger & Murphy, 1985). Policy and funding have advanced instructional leadership, focusing on narrowing the achievement gap and establishing a minimum standard of student achievement. Researchers reported that effective principals prioritized learning, grounded in instructional leadership (Terosky, 2016). Tan (2018) found that students' achievement improved the most with strong instructional leadership through principals' work with teachers on instructional capacity in mathematics. Educational policy makers have also highlighted the principal's role in instructional leadership. Principals with strong instructional leadership promote students' learning with the execution of the Measure of Academic Progress (MAP) Growth and MAP Skills (Goddard, Goddard, Sook Kim, & Miller, 2015). MAP Skills is a valuable instrument to assess ongoing instruction and

intervention efforts among classrooms. Goddard et al. (2015) revealed concepts and skills students know and still need to progress toward mastering. A school's effectiveness in using these programs systemically is the result of the principal's instructional leadership, according to Goddard et al. One dimension of instructional leadership is coordinating the curriculum.

The literature highlights how instructional leadership practices are crucial to improving student learning and teacher performance. According to experts, principals need to implement these practices to support teachers (Lochmiller & Acker-Hocevar, 2016; Ozdemir, 2019). The gap in practice was the need to examine how elementary school principals apply instructional leadership practices to support math teachers' efforts to improve students' proficiency in math. Few scholars have researched elementary school principals' instructional leadership role specific to mathematics content (Lochmiller, 2015). Principals can support teachers to improve their mathematics instruction with professional development (Steele et al., 2015). Urick, Wilson, Ford, Frick, and Wronowski (2018) also advocated that principals offer teachers professional development opportunities. This study was needed to generate new knowledge of instructional leadership practices for supporting mathematics teachers.

Problem Statement

The research problem was how elementary school principals with a background in mathematics apply instructional leadership to support math teachers. Instructional leaders need to enhance teaching opportunities to learn math through content-specific resources (Urick et al., 2018). Few researchers, however, have focused on the instructional

leadership role of elementary school principals as it pertains to mathematical content (Lochmiller, 2015). This lack of research is concerning because, for elementary students to increase their proficiency in mathematics, instructional leadership needs improvement (Williams & Welsh, 2017). As Bodnarchuk (2016) noted, instructional leadership supports student learning. Principals who have a math background make instructional leadership decisions based on their content knowledge (Lochmiller, 2015). It therefore follows that elementary school principals with a background in mathematics should be able to apply instructional leadership practices in the area of mathematics.

In the local context, the problem of mathematics student achievement is of particular concern. The research site was a metropolitan school district located in the southern United States. The school district administrators decided in 2015 to increase math state scores in elementary schools, according to a senior district administrator. District administrators worked with elementary school principals to determine math teachers' needs to help students pass math state tests, the administrator noted. District administration decided to use the MAP Skills program, a computer program designed to help students improve their math skills, the administrator noted. These efforts have met with limited success, however. If the principals' leadership practices with mathematics backgrounds are shared, then the effort may be more successful.

This research was needed to examine how elementary school principals apply instructional leadership practices to support math teachers' efforts to improve students' math proficiency. Researchers have found that principals affect student achievement (Mette et al., 2017; Ozdemir, 2019) and school performance (Leithwood & Azah, 2017).

Although the expectation is that elementary school principals apply instructional leadership practices in all academic subjects (Nguyen et al., 2018), Manaseh (2016) revealed that principals had no understanding of how to apply instructional leadership practices to help teachers. Principals need to apply instructional leadership to promote students' learning (Goddard et al., 2015) and teachers' instruction (Lochmiller & Acker-Hocevar, 2016; Ozdemir, 2019). As Bodnarchuk (2016) noted, instructional leadership supports teaching and learning. Principals are appraised on student achievement results and are responsible for maximizing student achievement (Karadag, Bektas, Cogaltay, & Yalcin, 2015). Branch et al. (2013) observed that highly effective principals raise the achievement of a typical student in their schools by between 2 and 7 months of learning in a single school year'. Curriculum-aligned math interventions enhance learning for students as measured by state scores with school principals (Gersten, 2016).

Purpose of the Study

The purpose of this qualitative case study was to understand how elementary school principals apply instructional leadership to support math teachers' efforts to improve students' proficiency in math.

Research Question

The research question addressed in this dissertation was, How do elementary school principals with a mathematics background apply instructional leadership to support math teachers' efforts to improve students' proficiency in math?

Conceptual Framework

The conceptual framework grounding this research was the instructional leadership model of Hallinger and Murphy (1985). Hallinger and Murphy outlined three main dimensions for instructional leadership: (a) defines the school mission, (b) manages the instructional program, and (c) promotes a positive learning climate. These three dimensions are divided into job functions classified as direct or indirect activities or behaviors. I used this conceptual framework to understand how elementary school principals apply instructional leadership to support math teachers' efforts to improve students' proficiency in math. I examined (a) functions engaged by principal, (b) types of activities performed by principals, and (c) practices of the school organization.

Researchers have revealed that effective school leadership is a determining quality to increase student achievement (Hitt & Tucker, 2016). Leithwood, Louis, Anderson, and Wahlstrom (2004) found that school-based leadership is the second most crucial factor in student academic achievement. The literature on the effects of school leadership effects literature (Day, Gu, & Sammons, 2016; Martin, 2018; Robinson, Lloyd, & Rowe, 2008) emphasizes the ability of principals to define the school mission. Successful school principals have a defined mission for student achievement and place a high priority on communicating the goals to all stakeholders (Suber, 2012). School principals who establish a clear vision and goals tied to student achievement and who consistently communicate these to staff increase overall student achievement. Student achievement is a primary emphasis in effective schools.

A critical instructional leadership role of effective school principals is to work with teachers on curriculum and instruction. School principals must play a role in managing instructional programs (Hallinger, 2003; Leithwood, Day, Sammons, Harris, & Hopkins, 2006; Marks & Printy, 2003; Robinson et al., 2008; Spillane, 2006). School principals are engaged in supervising and evaluating instruction, coordinating the curriculum, and monitoring student progress. Instructional leadership demands school principals who actively focus on teaching and learning (Ash, Hodge, & Connell, 2013). Focusing on teaching and learning therefore is a priority of instructional leadership.

Instructional leaders promote a positive school learning climate by protecting instructional time, supporting professional development, and offering teacher and student incentives. Effective school principals develop a culture that promotes and rewards continuous learning and improvement (Hallinger & Heck, 2003, 2010, 2011; Hallinger & Wang, 2015). Continuous culture of improving teaching and learning drives instruction to match the school's mission (McCann, Jones, & Aronoff, 2012).

The intent of this study was to understand the behaviors, practices, and school policies of effective school leadership to increase student achievement. Specifically, I wanted to understand how elementary school principals apply instructional leadership to support math teachers. I used Hallinger and Murphy's (1985) three main dimensions for instructional leadership--(a) defines the school mission, (b) manages the instructional program, and (c) promotes a positive learning climate--to create the open-ended interview questions found in the interview protocol (see Appendix A). I also drew from the measure of instructional leadership characteristics when analyzing the data for emergent

themes. The conceptual framework of instructional leadership related to the research question, which was how elementary school principals apply instructional leadership to support math teachers in improving students' proficiency in math.

Nature of the Study

I used a case study research design for this qualitative study. Ravitch and Carl (2016) noted that qualitative research makes meaning of the participants' experiences. A case study is an exhaustive analysis of a phenomenon in its natural context (Yin, 2014). A case study was most suitable to develop a comprehensive understanding of how elementary school principals apply instructional leadership to math achievement. This research design required a specific group of elementary school principals. This case study was, therefore, bounded to this particular group that has mathematics content knowledge.

I used purposeful sampling to identify elementary school principals who can provide the appropriate data within the scope. The purposeful sample consisted of elementary school principals who apply instructional leadership to math achievement. Kozleski (2017) stated that to gain a greater understanding of participants' purposeful sampling should be used. The data source was semistructured face-to-face interviews via Zoom with elementary school principals lasting approximately 1 hour. I used an open-ended interview protocol to interview 12 elementary school principals. Interviews are the primary source of data for this research study. I immediately used the recordings to transcribe of the interviews was followed. I used a data software program called Dedoose for coding and to organize the data. Open coding was used to analyze the data from the interview transcripts.

Definitions

Instructional leadership: A term used to describe how principals manage schools focusing on student achievement by defining the school mission, managing the instructional program, and promoting school climate (Hallinger & Wang, 2015).

Leadership content knowledge (LCK): A term used to define principals' academic subject knowledge of the content as instructional leaders (Stein & Nelson, 2003).

Proficiency: Standards used to determine levels of achievement on standardized test and state accountability assessments. Texas measures student achievement using the State of Texas Assessment of Academic Readiness (STAAR), with four levels of proficiency: did not meet, approaches meet, and masters (Hallinger & Wang, 2015).

Student achievement: A measure of student performance outcomes on standardized tests or state accountability assessments to determine academic proficiency (Mackey, 2016).

Assumptions

In this research, I assumed the elementary principals I interviewed responded to the interview questions to the best of their ability and comprehended this study's purpose. I also assumed the elementary principals were open and gave explicit details when articulating the specific instructional leadership strategies used. I assumed that the school's academic gains and current performance are a result of the principals' instructional leadership, since the principal is the leader of the school, and school leadership is second to teacher quality in student achievement.

Scope and Delimitations

This study's scope was one school district that provided information on the actions of elementary school principals with LCK; how they applied instructional leadership in the area of mathematics. Principals were a focus due to their ability to indirectly increase student achievement (DuFour & Marzano, 2011). Specifically, instructional leadership practices of principals' have been shown to increase the quality of teacher instruction (Katterfeld, 2013). The scope of this study was one urban public school district located in the southern United States. The school district consisted of 82 elementary school principals. The sample for this study was 12 elementary school principals who posed the necessary mathematics background. LCK was not a framework included in this study. I focused on the actions and application of elementary school principals' instructional leadership who had the content knowledge or required mathematics background.

Limitations

Conducting this research in one of the largest local urban school districts was a limitation. The school district's size presented an issue of transferability due to the varying levels of contextual factors and demographics of the elementary school principals and the additional impact these factors had on the application of instructional leadership. Another limitation to this study was the self-reporting nature of the actions and applications from the principal. The way a person sees oneself is often not connected to their actions (Brutus, Aguinis, & Wassmer, 2013).

Significance

The mission of the school district was to improve student's proficiency in math at the elementary level. The results of this qualitative case study help elementary school principals to apply instructional leadership to better support math teachers for students to improve their proficiency in math by defining the school mission, promoting a positive school climate, and managing the curriculum and instruction. School district administrators could use the findings to understand the needs of elementary school principals regarding their instructional leadership. Implications for positive social change included information for school principals to better apply instructional leadership practices to support mathematics teachers for students to improve their proficiency and graduate from school.

Summary

The purpose of this qualitative case study was to understand how elementary school principals applied instructional leadership to support mathematics teachers to improve student proficiency in mathematics. The conceptual framework was the instructional leadership of Hallinger and Murphy. Data were collected through semistructured face-to-face interviews via Zoom using an interview protocol. Data were analyzed using thematic analysis for emergent themes.

Principals are instructional leaders (Mazzoni, 2017), and teachers need support from principals (Davis & Boudreaux, 2019; Ozdemir, 2019). Urick et al. (2018) advocated that principals offer professional development opportunities to teachers. Effective principals prioritized learning (Terosky, 2016). A school's effectiveness was

the result of the principals' instructional leadership (Goddard et al., 2015). Effective instructional leaders support teachers and emphasized student learning.

In Chapter 2, I present the literature review. The conceptual framework was defined and explained how it related to this study. Literature review topics included instructional leadership, student achievement, and LCK.

Chapter 2: Literature Review

The research problem was that elementary school principals are inconsistently applying instructional leadership to support mathematics teachers for students to improve their proficiency. The purpose of this qualitative case study was to understand how elementary school principals apply instructional leadership to support mathematics teachers to improve student proficiency in mathematics. The research question was how elementary school principals applied instructional leadership to support mathematics teachers to improve student proficiency in mathematics. This research was needed to address inadequate knowledge of the instructional leadership role of elementary school principals as it pertains to mathematical content (Lochmiller, 2015).

Principals manage teaching and learning and in so doing affect student achievement (Ozdemir, 2019) and school performance (Leithwood & Azah, 2017). As experts have noted, principals have the responsibility to maximize student achievement (Karadag et al., 2015), including math achievement (Tan, 2018), and improve student outcomes (Martin, 2018). To improve student achievement, principals need to apply instructional leadership practices (Lochmiller & Mancinelli, 2019; Nguyen et al., 2018). To do so effectively, principals need to understand how to apply instructional leadership practices to help teachers (Manaseh, 2016). In this chapter, I review the literature and explain the conceptual framework. In the literature review's major sections, I define instructional leadership and discuss student academic achievement, policies on instructional leadership, LCK, and measures of academic progress. I also review

literature on students' proficiency in mathematics. I begin the chapter by discussing my literature search strategy.

Literature Search Strategy

I searched for peer-reviewed literature published between 2016 and 2020 using EBSCOhost, ProQuest, Taylor and Francis, and ERIC databases, which I accessed from Walden University Library. Search terms included *instructional leadership*, *elementary principals*, *leadership content knowledge*, and *math proficiency*. Google Scholar was also used because it searches all databases; I accessed pertinent results directly through the source database within Walden's library. As I read the literature I gathered, I followed up on related references cited within the last 5 years. Afterward, I analyzed and organized the articles into sections and subsections.

Conceptual Framework

In this study, I looked specifically at elementary school principals' provision of instructional leadership regarding mathematics instruction. Thus, this study required a framework that could be the basis for the interview questions to answer the research question. Because of its pertinence, I selected the instructional leadership theory of Hallinger and Murphy (1985) as the conceptual framework of this study. Hallinger and Murphy defined three main dimensions of instructional leadership: (a) defines the school mission, (b) manages the instructional program, and (c) promotes the school climate. These instructional leadership dimensions break down into job functions, actions, and behaviors performed by the school principal (Hallinger & Murphy, 1985). The level or type of principal activity can be a direct or indirect interaction consisting of behaviors,

practices, and policies. Organizational processes guide the school's activity as an organization and facilitate the application of instructional leadership functions.

The first dimension of instructional management concerns defining the school mission and consists of two functions: (a) framing school goals and (b) communicating school goals (Mackey, 2016). The school's mission to improve student learning routinely communicated to staff, parents, students, and other community members is an example (Ismail, Don, Husin, & Khalid, 2018; Mackey, 2016; Shaked & Schechter, 2016).

Effective instructional leaders prioritize all stakeholders in the school and community and make everyone aware of the school's mission. A school's mission focused on improving student achievement is shared with more than the internal teachers and staff.

The second dimension of instructional leadership is managing the curriculum and instruction and consists of three functions: (a) supervising and evaluating instruction, (b) coordinating curriculum, and (c) monitoring student progress (Campbell et al., 2019).

Principals with instructional leadership have effectively improved student outcomes by improving teacher practice (Campbell et al., 2019; Grissom, Kalogrides, & Loeb, 2017).

Instructional leaders who manage instructional programs well ground their approaches in learning principles and seek the input of teachers (Terosky, 2016). Supervision and evaluation are a direct activity of instructional leadership (Hallinger & Murphy, 1985).

This dimension is the most prominent one when considering instructional leadership.

The third dimension is promoting a positive school learning climate, which consists of mostly indirect activities. Six job functions make up this dimension: (a) protecting instructional time, (b) promoting professional development, (c) maintaining

high visibility, (d) providing incentives for teachers, (e) enforcing academic standards, and (f) providing incentives for students (Campbell et al., 2019). These three dimensions shown in Table 1 are interconnected and define the specifics of instructional leadership.

Table 1

Dimensions of Instructional Leadership

Defines the school mission	Manages the curriculum and instruction	Promotes a positive school learning climate
(a) framing school goals	(a) supervising and evaluating instruction	(a) protecting instructional time
(b) communicating school goals	(b) coordinating curriculum (c) monitoring student progress	(b) promoting professional development (c) maintaining high visibility (d) providing incentives for teachers (e) enforcing academic standards (f) providing incentives for students

I concluded that the conceptual framework of instructional leadership by Hallinger and Murphy (1985) was appropriate for this study of elementary school principals' instructional leadership practices to improve student achievement in math, and I based the interview protocol on the theory. Specifically, the open-ended interview questions were developed based on the dimensions of the instructional leadership theory. The real challenge of principals is “finding the proper balance between direct and indirect activity” (Hallinger & Murphy, 1985, p. 221), considering each school's contextual factors. Principals play a vital role in focusing on learning in schools through their continual engagement in instructional leadership (Gurley, Anast-May, O'Neal, & Dozier,

2016). Instructional leadership builds structures and systems to support teachers, fostering student learning and increasing achievement (Goddard et al., 2015). Use of this framework allows researchers to identify and pinpoint specific behaviors and actions of instructional leadership essential for increasing student achievement.

The instructional leadership theory gained notability with Edmonds' (1979) research on effective urban elementary schools. Instructional leadership theory included the significance of the school principal (Bossert, Dwyer, Rowan, & Lee, 1982; Dwyer, 1985; Glasman, 1984; Leithwood & Montgomery, 1982). Policymakers began to create policies to foster school principals to adopt instructional leadership to boost student achievement (Barth, 1986; Cuban, 1988). During the 1990s, school principals framed instructional leadership (Hallinger, 1992; Rowan, 1995; Spillane & Halverson, 1998; Stein & D'Amico, 2000). School principals need to focus on applying leadership theories (Al-Mahdy, Emam, & Hallinger, 2018; Mette et al., 2017; Urick et al., 2018). Leadership theories were applied to determine elementary school principals' specific actions and behaviors (Lochmiller, 2015). Principals are the core of instructional leadership.

Literature Review Related to Key Variables and/or Concepts

Instructional Leadership

Principals need to recognize the activities of instructional leadership. Actions and behaviors characterized as direct or indirect instructional leadership (Hallinger & Wang, 2015; Shaked, 2018). Bendikson, Robinson, and Hattie (2012) reported that principals with indirect and direct leadership behaviors increased instructional leadership activities. The effective principal provided support to teachers to improve instruction quality

(Bendikson et al., 2012). Indirect activities are discussed below and then followed by a discussion of direct.

Principals work with teachers directly, which indirectly promotes student learning. Principals had an indirect effect on learning and student achievement with structural elements such as organizational practices and environmental settings (Branch et al., 2013; Brown, 2016; Kalman & Mustafa, 2016; Mackey, 2016; Ozdemir, 2019; Sebastian, Huang, & Allensworth, 2017). Principals focused on teaching and learning (Hallinger & Wang, 2015). Indirect activities outlined what to do when there was no direct supervision. Principals addressed indirect activities through policies and practice. For example, a school could have a policy that every student reads for 20 minutes each night for homework. This policy governed expectations for the entire staff, and the principal as the instructional leader, occasionally monitors teacher execution. Another example of an indirect policy would be the requirement of respect agreements in every classroom. One major disadvantage of indirect activity was that it required a great deal of teacher commitment to the policy to be effectively implemented.

Principals need to identify specific direct practices of instructional leadership. Direct activities refer to actions performed directly by the principal or when principals work with individual teachers (Hallinger & Wang, 2015). Direct instructional leadership activities focused on improving teaching practices (Sebastian et al., 2017). Supervising instruction in classrooms and providing teachers with feedback is a direct instructional leadership activity to “ensure school goals translate into classroom practices” (Hallinger & Murphy, 1985, p. 222). Setting goals, leading professional development for teachers,

and ensuring teacher quality are examples of direct instructional leadership (Murphy, Neumerski, Goldring, Grissom, & Porter, 2016) while monitoring student progress can be implemented directly or indirectly (Hallinger & Murphy, 1985). Principals had a significant effect on school performance (Leithwood & Azah, 2017; Wahyuddin, 2017; Woods & Martin, 2016). Direct instructional leadership activities are functions performed by the principal.

Principals are the core of instructional leadership because they set the tone and vision for the entire school. The Wallace Foundation (2013) found five key responsibilities of principals as instructional leaders. Shaping a vision of academics for all students, setting a school-wide vision for commitment to high standards and the success of all students, and having high expectations are some examples of a key responsibility. Another responsibility was to narrow the achievement gap between advantaged and less advantaged students. Policy mandates have required principals to shift academic expectations and beliefs to learning for all students and ensure staff supports these beliefs. The effective principal creates a climate hospitable to education where the learning environment is safe, filled with supportive attitudes, and connects all stakeholders. The principal cultivates leadership in others and works with teachers to share the responsibility of student progress, to foster teacher collaboration, and to work with teachers on assessments, curriculum alignment, and instruction. School principals promoted professional learning by working directly with teachers (The Wallace Foundation, 2013). Barth (1986) stated that principals must understand as instructional

leaders, for students to grow and learn, teachers must first grow and learn. Principals are responsible for classroom instruction and student learning.

As instructional leaders, principals used five leadership dimensions to focus on the primary goal to develop high-quality teachers and ensure learning for all students. Wallin, Newton, Jutras, and Adilman (2019) studied instructional leadership using the framework of Robinson et al. (2008) five leadership dimensions. The dimensions consist of establishing goals and expectations, ensuring an orderly and supportive environment, promoting and participating in teacher learning and development, planning, coordinating, and evaluating teaching and curriculum, and resourcing strategically. Analyzing the first dimension, which is establishing goals and expectations, Wallin et al. found that principals routinely communicated their expectations, values, and used goal-setting with teachers. Principals used five strategies to promote teachers to participate in learning opportunities (Wallin et al., 2019). Principals do the following strategies: (a) create time for teachers to collaborate, (b) allow teachers autonomy in professional learning choices, (c) conduct action research around school goals, (d) deploy staff in different grade levels or content areas to teach, and (e) are lead learners (Wallin et al., 2019.). Investigating the fourth dimension using resources strategically, principals used a variety of strategies to obtain needed resources. Ensuring an orderly and supportive environment, principals looked for opportunities to involve stakeholders in education (Wallin et al., 2019). These examples emphasized the actions principals took to foster instructional leadership.

The five leadership dimensions framework was similar to Hallinger's and Murphy's (1985) instructional leadership theory of dimension and job functions. The

leadership dimension of establishing goals and expectations relates to the instructional leadership dimension defining the school mission. Ensuring an orderly and supportive environment links to promoting a positive school learning environment. Managing the curriculum and instruction connects to the dimension for planning, coordinating, and evaluating teaching and curriculum. The last two leadership dimensions, promoting and participating in teacher learning and development, and strategically resourcing, are embedded in the dimension's job functions, promotes a positive school learning environment. Hallinger's and Murphy's (1985) and Robinson et al. (2008) investigated school principals' instructional leadership actions to improve teaching and learning. The two frameworks of instructional leadership focused on student achievement.

Researchers have studied the functions of high-performing principals. Martin (2018) researched the qualities of principal instructional leadership in high-performing schools. Martin stated that high-performing school principals understood that teachers were important in improving instruction and routinely offered teachers professional development to deepen their pedagogical knowledge. Principals improved the quality of teaching and learning (Muda, Mansor, & Ibrahim, 2017). Principals prioritized activities and functions around teaching and learning.

The perceptions of the principal were influential for teachers. When teachers' perceptions of leadership were high, then student performance was high (Mackey, 2016). Elementary school principals were perceived to have high instructional leadership (Nguyen et al., 2018). Sebastian, Allensworth, Wiedermann, Hochbein, and Cunningham (2019) found that effective principals who promoted school improvement focused on a

positive learning environment, including school safety and teacher expectations. Moore, Kuofie, Hakim, and Branch (2016) found that principals with great instructional leadership maintain visibility within their schools. Likewise, Martin (2018) revealed that principals with high school-performance significantly engaged in defining the school mission, managing the instructional program, and creating a positive school culture. These comprise the elements of instructional leadership. Highly effective school principals were good instructional leaders with great vision.

In order for principals to be effective instructional leaders, they must understand the roles and dimensions of instructional leadership. Manaseh (2016) revealed that principals had no understanding of instructional leadership models and were not effective in managing instructional programs. Additionally, Campbell et al. (2019) found that school principals did not view themselves as instructional leaders, but only as facilitators of the concept and their understanding of instructional leadership was weak. Principals cannot lead in areas in which they do not understand. Assessing principals in roles and behaviors they cannot define is problematic (Hallinger & Murphy, 1985). A formal definition of instructional leadership had been challenging to agree upon within the literature; the concept of instructional leadership is multi-dimensional (Dimmock & Tan, 2016). The literature had renamed the term instructional leadership over the years as learning-centered leadership and leadership for learning (Gumus, Bellibas, Esen, & Gumus, 2018; Liu, Hallinger, & Feng, 2016). A firm understanding of instructional leadership is a need.

With the many roles and tasks, principals' can be effective instructional leaders. Managing the day-to-day functions employed a significant percentage of principals' time (Gawlik, 2018; Murphy et al., 2016; Shaked, 2018; Urick, 2016). School leaders should be high performing principals (Hitt & Tucker, 2016). Creating a vision, mission, building a culture, and instructional supervision is a fusion of leadership (Hussain, Haider, Ahmed, & Ali, 2016). According to Hussain et al. (2016), successful school principals leverage professional learning and reflect on student work. Hussain et al. found that principals need to focus on instruction, curriculum, and assessments. One practice of successful principals reflected their job and what they did (Hussain et al., 2016). Mazzoni (2017) showed that even with minimal time in the classroom, a principal could be an effective instructional leader through setting a school vision, providing feedback on formal evaluations, and supporting professional development opportunities. Instructional leaders set a vision for everyone within the school to aim for, and they monitor the progress of that vision (Hussain et al., 2016). Even with limited time, instructional leadership can be a priority.

The learning climate was a dimension of instructional leadership. Teachers value instructional leaders who built positive school culture (Davis & Boudreaux, 2019). Teachers reported one function of instructional leadership in multiple studies as one of the most imperative leadership practices, preserving instructional time (Brown, 2016; Cansoy et al., 2018; Dixon, 2015). Effective instructional leaders stress the importance of classroom instructional time and learned the content knowledge and pedagogy to advance teachers (Hitt & Tucker, 2016). Teachers have the most direct effect on student

achievement and hold high respect for school principals who protect instructional time. Shaked (2018) interviewed 41 principals to understand why instructional leadership suffered. Shaked noted a gap in the implementation of professional recommendations, principal behaviors, and the accompanying policies. As principals interpret and react to policy differently, they often decide which external factors to focus on (Shaked & Schechter, 2016). Three core barriers exist in why principals sidestep instructional leadership. First, principals' lack sufficient uninterrupted time to spend in classrooms to improve instructional practices (Goldring et al., 2015; Murphy et al., 2016; Shaked, 2018). Principals reported (Shaked, 2018) they lack control over their time. Second, principals lack the explicit instructional leadership content knowledge needed for the role of instructional leader (Goldring et al., 2015). Third, deep-rooted school norms viewed instruction as teachers' territory only (Goldring et al., 2015; Murphy et al., 2016; Shaked). Instructional leadership actions performed by principals can be direct or indirect activities (Hallinger & Wang, 2015). Effective school principals must balance the roles of manager and instructional leader (Hitt & Tucker, 2016; Hussain et al., 2016). Instructional leadership starts with setting a vision tied to student achievement (The Wallace Foundation, 2013). Principals must be willing to lead learning that is intentional in improving teaching practices (Stein & Nelson, 2003). Principals can be effective instructional leaders (Mazzoni, 2017) by defining the school mission, managing the instructional program, and creating a positive school environment (Hallinger & Murphy, 1985). A positive learning environment sets the stage for students to achieve.

Student Academic Achievement

Principals as instructional leaders play a role in the relationship between teacher collaboration, collective efficacy, and student achievement. Instructional leadership has the most significant effect on student achievement since it is the most important concept related to teaching and learning (Corcoran, 2017; Karadag et al., 2015). Instructional leadership has a significant positive effect on disadvantaged students' achievement the most (Tan, 2018). Principals with great instructional leadership practices help students' score higher in mathematics on state tests (Grissom et al., 2017; Palmer, Gardiner, & Hermond, 2016). Enabling teachers to act as an instructional practice has the most significant correlation between leadership practices and high mathematics performance (Palmer et al., 2016). Scholars have reported a positive effect of instructional leadership on student achievement (Farnsworth, Hallam, & Hilton, 2019). Elementary school principals who focus on instructional leadership help students improve their academic achievement (Mette et al., 2017). Grissom et al. (2017) reported a positive correlation between the amount of time school principals spent on the school's instructional programs and student achievement. Competent school principals have a positive effect on school performance (Babo & Postma, 2017). When principals understand instructional leadership's role and consistently perform at high levels of instructional leadership, student achievement rises.

One of the direct activities of instructional leadership is supervising and evaluating instruction. An instructional leadership emphasis is vital for teachers to improve professionally and student learning to expand (Kaparou & Bush, 2016). Khan

and Shaheen (2016) studied 90 school principals' leadership roles in student academic achievement. Khan and Shaheen (2016) found that effective principals build collaboration and increase teacher involvement and commitment to the school. Khan and Shaheen (2016) indicated that effective principals created a strong climate of instruction and developed the leadership within their teachers. Effective principals sought professional development to increase instructional methods, develop teachers, and develop students' personalities. Through a focus on quality instruction, principals improve achievement (Khan & Shaheen). For school-wide improvement, a school's vision must center on student learning and achievement (Hallinger & Wang, 2015). Pietsch and Tulowitzki (2017) found that instructional leadership is the primary source of influencing instructional practices. When principals work directly with teachers on quality instruction, student achievement rises.

Grissom , Kalogrides, and Loeb (2015) studied 523 principals' contribution to student performance by examining state test score growth to link principals to student achievement. They investigated three approaches to determine principals' contributions, school effectiveness, relative school effectiveness, and school improvement. Grissom et al. (2015) reported that principals affect student achievement through their effects on teacher instructional capacity. Grissom et al. (2015) found that principals contributed to 54% of math achievement and only 37% of reading achievement. Grissom et al. (2015) highlighted that principals could be more effective in mathematics than reading. Grissom et al. (2015) contended that evaluating principals on measures of student test performance

draws attention to student learning and improves student outcomes. When school principals focus on student learning, student outcomes improve.

Principals need to apply instructional leadership practices to improve student achievement. Day et al. (2016) researched how successful school leaders combine transformational and instructional leadership strategies to improve student outcomes. Day et al. (2016) examined 20 schools in an in-depth 3-year mixed-method national impact study. Day et al. (2016) found that principals improve schools through both direct and indirect activities and strategies. Day et al. (2016) found that principals' ability to improve schools depended on understanding the school's needs and applying leadership style. Day et al. (2016) noted that principals need more differentiated support and development and contextual training according to their school needs. Likewise, Chaseling et al. (2017) focused on 21 school leadership teams as the key measure of school improvement, and the goal was to improve school leadership to improve student outcomes. Principals play an active role in school performance (Leithwood & Azah, 2017; Wahyuddin, 2017). Brown (2016) studied the supports elementary principals in high-achieving schools implement to increase student achievement. Brown examined the tenets of perspective on the learning environment, learner-centered, knowledge-centered, assessment-centered, and community-centered to determine the areas in which principals implement or take action to increase student achievement. Brown showed that data-driven leadership was at the core of the perspectives on the learning environment. School principals led discussions and curriculum efforts aligned with the standards and used

walk-throughs as a source of data to ensure the alignment of knowledge-centered instruction.

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Five critical dimensions resulted from the systematic review. First, effective school leaders establish and convey a vision. Goals provide a common purpose and sense of clarity in a challenging environment. Second, they facilitate high-quality learning experiences for all students through preserving safety and orderliness, reflecting students' backgrounds in the environment, and monitoring the instructional and assessment programs (Hitt & Tucker, 2016). Third, effective school principals seek to build the professional capacity of others. While developing the capacity of teachers, effective principals learn with their faculty. Learning with teachers strengthens the principals' creditable knowledge in curriculum, instruction, and assessment (Lochmiller & Cunningham, 2019). It also strengthens the teachers' perceptions of the principal as a resource of knowledge and assistance (Cunningham & Lochmiller, 2019). Fourth, principals create a supportive environment for learning. Principals who positively impact student achievement shape a school's values and norms, allocate resources strategically, maximize organizational functioning, and build collaborative processes for decision-making. Finally, they build a community with external stakeholders. Effective principals acknowledge the importance of external partners through building productive relationships, engaging families, and anchoring the school in the community by connecting helpful community agencies with families (Hitt & Tucker, 2016). These five domains outline the actions high performing school principals take to improve student achievement.

Another dimension of instructional leadership in the content area is that school principals create a supportive organization for mathematics instruction by establishing a

vision and maintaining a strong culture. Lochmiller and Cunningham (2019) reviewed the research on instructional leadership specific to mathematics content using the same unified leadership framework from Hitt and Tucker's (2016) review. Specific to the context of mathematics school principals, as Lochmiller and Cunningham (2019) found, facilitate high-quality instructional experiences by cultivating and monitoring curriculum programs, instructional programs, and assessment programs. Lochmiller and Cunningham (2019) found that school principals identify practical ways to influence how teachers think about their math instruction and oversee classroom instruction. Research scholars noted that this requires understanding content and pedagogy to lead teachers to improve instructional practices (Lochmiller & Cunningham, 2019). School-based settings shape how teachers connect with and engage in instructional practices. Effective school principals support professional growth by building others' capacity and rely on their expertise while supporting equity and diversity among staff and students (Lochmiller & Cunningham, 2019). Lochmiller and Cunningham (2019) reported that effective school principals use varying tactics to connect and collaborate with external stakeholders to acquire additional resources and strategically use them. The principal's role as instructional leadership is multifaceted, and effective principals' work is multi-dimensional as presented in these critical areas.

Researchers have shown that there is a relationship between the instructional leadership of school principals and student achievement. School principals concentrated on teaching practices and student learning through professional development and supervising and evaluating instruction (Khan & Shaheen, 2016). Both direct and indirect

instructional leadership activities improve student achievement (Day et al., 2016). Data-driven instructional leadership sustains the focus on student outcomes (Brown, 2016). Hitt and Tucker (2016) reported five essential leadership practices that influenced student achievement. Using the same framework as Hitt and Tucker (2016), Lochmiller and Cunningham (2019) studied the essential leadership practices that influenced student achievement, specifically mathematics. Instructional leadership focuses on student achievement.

Policies on Instructional Leadership

Every Student Succeeds Act (ESSA) of 2015 is the latest reauthorization of education policy. One of the aims of educational policy is to narrow the achievement gap (Williams & Welsh, 2017). The policy's goal is quality education for all students by narrowing the achievement gap of disadvantaged students who fall into four categories, minorities, students in poverty, special education students, and English as a second language students (Mackey, 2016; Shaked, 2018). Under the ESSA policy, mathematics and reading are assessed annually for students in third through eighth grade and once in high school. Elementary school principals' instructional leadership practices have been modified based on new educational policies (Lochmiller & Mancinelli, 2019) and increased instructional leadership studies focusing on the principal's role in the instructional process (Gumus et al., 2018). Lochmiller and Mancinelli (2019) found that two-thirds of the 354 elementary school principals reported the most significant change in their instructional leadership practice was consistent and in-depth classroom observations. Changes in educational policy require principals to evaluate and support

teachers (Neumerski et al., 2018; Woulfin & Rigby, 2017). These policies pair teacher development with teacher evaluation guidelines.

Educational policy guides the actions of instructional leaders. Indicators for implementing mathematics standards under ESSA focus on the supports of instructional leadership (Urick et al., 2018). ESSA provides flexibility and autonomy in implementing education programs for students (Williams & Welsh, 2017). Yi and Kim (2019) reported that educational policy has a significant direct influence on principal leadership.

Principals internalize these policies, educational goals, and accountability by supporting professional development and aligning teaching practices (Yi & Kim, 2019). Notably, these policies are more often strongly influenced by principals of low-performing schools, as a source of consequences of teacher evaluation (Yi & Kim, 2019).

Educational policies help school principals lead their buildings as instructional leaders. Monitoring school policy is an indirect activity of instructional leadership (Hallinger & Murphy, 1985). Indirect activities are necessary functions of instructional leadership.

The educational policy sets the standards for school accountability. Roegman, Perkins-Williams, Maeda, and Greenan (2018) aimed to understand how accountability influenced instructional leadership. The accountability movement formed school principals' practices in spotlighting state assessment data, various practices to meet state requirements instructional and specific groups of students (Lochmiller & Mancinelli, 2019; Roegman et al., 2018). School principals are under pressure to meet accountability standards or face sanctions and various other consequences (Klein, 2015). Instructional leaders, who use data, identify students who do not meet standards, align school aims to

accountability, and concentrate on students passing state assessments (Roegman et al., 2018). Policy centered on accountability did produce new school principals' routines out of bureaucratic expectations (Marsh, Farrell, & Bertrand, 2016). Marsh et al. (2016) found that a lack of content knowledge prevented adequate support of teachers (Steele et al., 2015). Educational Policy came about to increase student learning and narrow the achievement gap of disadvantaged students.

The induction of the Race to The Top (RTTT) (2009) grant brought a new way of educational policy states enacted to gain additional points in the grant process. Wieczorek, Clark, and Theoharis (2019) investigated how public school principals perceived their role to provide feedback on instructional during RTTT. Two overarching findings exist; rubrics inform and guide the principals' classroom supervision and evaluation procedures. Secondly, rubrics use enhanced principals' feedback to be more frank and honest conversation backed by evidence. Research-based rubrics provided evidence from a classroom walk-through, consisting of a pre-conference, observation, and post-conference. Principals recorded specific evidence of what the teachers and students were during on aspects of the teacher-effectiveness rubric. Utilizing these rubrics increased principals' confidence to evaluate instruction, and the data provide the evidence (Wieczorek et al., 2019). The principals noted how their supervision and evaluation practices and feedback conversation changed as a result of RTTT.

One change in policy was to observe all teachers in the building within given intervals. Teachers participated in the evaluation process by submitting their evidence of effective teaching, thus increasing collaboration and reflection amongst teachers

(Wieczorek et al., 2019). Wieczorek et al. (2019) provided clear indicators and standards for principals to supervise and evaluate instruction. This new policy outlined a process and criteria for evaluating teacher performance. Wieczorek et al. (2019) noted that principals increase their use of data and documentation in response to this new policy criterion-reference and evidence-based model. RTTT boosted the era of data-driven systems in regards to instructional improvement. Principals reinforced their vision and goals backed by observational data and use data to lead improvements with instruction. The process was more rigorous and systematized in identifying ineffective teaching practices.

During the RTTT time principal used a rubric to provide instructional feedback. Wieczorek et al. (2019) found the rubric limited content-specific instructional feedback; principals described it as neutral constructive feedback. The rubrics focused on student engagement in the learning process, the generic nature of the focused on broad concepts not pedagogically specific. The rubrics lacked specificity in the content areas through principals charged with providing diagnostic constructive instructional feedback (Wieczorek et al., 2019). Principals tasked with increasing their knowledge about instruction used the tool; however, the tool lacked a focus on specific content. Principals stated the rubric-aligned conversation to be more honest, based on evidence, and allowed for more constructive feedback (Wieczorek et al., 2019). The supervision and evaluation rubric's student-centered nature communicated the need for students' first and increased attention to instructional practices. The educational policies that came with RTTT

brought in a new era of data-driven instructional practices and evidence ingrained evaluations.

Educational policy has shaped the charge of school principals and highlighted the importance of student achievement. An educational policy intended to narrow the achievement gap of disadvantaged students (Williams & Welsh, 2017). The policy has a considerable effect on school principals' act on these policies, educational goals, and accountability requirements through increased professional development efforts and aligning instructional practices (Yi & Kim, 2019). RTTT brought in new attention to evidence-based supervision and evaluation using data. Educational policies focus on student achievement.

Leadership Content Knowledge

School principals' ability to support teachers in instructional improvements depends on their LCK. Elementary school principals as instructional leaders of mathematics need to have a background in mathematics (Cummings, 2016). Principals' unfamiliarity with content knowledge causes avoidance of direct support for teachers (Lochmiller & Acker-Hocevar, 2016; Rigby et al., 2017; Shaked, 2018). Steele et al. (2015) asserted that understanding mathematics content is imperative for principals to analyze mathematics teaching, allowing principals to examine student thinking versus student characteristics. Rigby, Forman, and Lewis (2019) found that 72% of elementary school principals' instructional leadership moves concentrated on general teacher practices. Instructional leaders need to address the general teacher practices and math specific content practices.

Content-specific practices can address the instructional content through the process, standards, or rigor of the lesson. Mathematics-content specific instructional moves are particular to the mathematical ideas or specific lessons (Rigby et al., 2017). Mathematics-content specific instructional leadership moves indicate the principal understands the mathematical goal of the class and can connect whether the instructional decisions made by the teacher, led to or did not lead to the goal of the class, and in turn the decisions the principal makes based on those factors (Rigby et al., 2017). Rigby et al. (2017) reported 11% of mathematics-content specific instructional moves by principals. In contrast, principals had questions or made decisions about the mathematics content itself, and 14% of instructional leadership moves on the mathematical practice standards of how students perform the mathematics. Principals need to have some comprehension of the content standards.

Academic subject knowledge offers a different look into teaching and learning. Having content knowledge of mathematics allows principals to design and select proper professional development and improvement initiatives (Steele et al., 2015). Urick et al. (2018) advocated that principals be afforded professional development for content-specific instructional leadership in advancing the opportunity to learn mathematics. This focus on teaching and learning ties to the job function embedded in the instructional leadership dimension of promoting a positive school learning environment. Steele et al. (2015) observed that principals with mathematical backgrounds went beyond observing for clearly written objectives and student engagement to examining the instructional quality of mathematical tasks. Principals asserted more mathematical authority as their

LCK increases (Steele et al., 2015). Principals with LCK can attend to teacher deficiencies in the content.

Principals' background knowledge and experiences with mathematics affected their instructional leadership. Principals' instructional leadership directly related to mathematical content knowledge (Bouton-Wales, 2016). Monitoring instruction in mathematics required an enhanced understanding of content knowledge and pedagogy to lead teachers to improve instructional practices (Lochmiller & Cunningham, 2019). Principals also coached teachers of mathematics (Cummings, 2016). Lochmiller (2015, 2016) reported that principals who had a mathematics background engaged in different actions than those without a mathematics background. Principals who lacked the mathematics LCK did not support their teachers with concerns of instructional practices for fear of sounding unknowledgeable (Lochmiller, 2015, 2016). Professional development helps principals as instructional leaders of mathematics build their teachers (Boston, Henrick, Gibbons, Berebitsky, & Colby, 2017). Professional development increases LCK of principals.

The kind of LCK principals possessed should be considered. Fuentes and Jimerson (2019) noted that school principals were often engaged in a context of an instructional mismatch, were leaders lead teachers in grade level and content areas which they were unfamiliar; when working in these areas, the feedback was on content-neutral practices. Instructional mismatches present challenges in having rich dialogue around the content matter and feedback, leading to substantial improvements in teaching and learning (Fuentes & Jimerson, 2019). LCK aimed at the big ideas in the discipline. Instructional

leadership is developing knowledge about content-specific teaching practices (Fuentes & Jimerson, 2019). Elementary school principals who were strong in LCK distinguish between teaching practices that mask the absence of rigorous instruction (Bauml, 2016). LCK changed the focus of instructional feedback.

Educational policy has repeatedly called upon school principals to improve instruction and student learning outcomes. Cunningham and Lochmiller (2019) performed a systematic literature review to emphasize the link between principals' instructional leadership and teachers' instructional practice. One major facet of instructional leadership was for leaders to give detailed feedback about teacher instructional practices and suggestions for improvement and change. "A central assumption of instructional leadership was that leaders possess the requisite skills and content knowledge to effectively engage in conversations about pedagogy that reflected the particular nuances of the subject" (Cunningham & Lochmiller, p 8). The educational policy requires the knowledge of content.

New curriculum standards and policies have increased the expectations of principals to provide effective leadership in the content areas. As effective instructional leaders, school principals support teachers, instruction, and a rigorous curriculum (Hallinger & Murphy, 1985; Hitt & Tucker, 2016). Principals need to support teachers to improve instruction (Robinson et al., 2008), endeavoring at the high goal of student achievement. LCK help principals to focus on rigorous teaching to improve student learning.

LCK offered another level of support for teachers. Cunningham and Lochmiller (2019) noted that the literature stated leaders influence mathematics instruction through creating conditions for teachers to effectively plan for instruction, peer to peer mentoring, and professional learning communities (PLCs) centered on a quality conversation about improving instruction. Principals need LCK and pedagogy (Fuentes & Jimerson, 2019; Lochmiller, 2016). Principals support teachers by providing a vision for mathematics, maintaining a robust math curriculum, offering content-specific professional development, and ascertaining instructional improvement (Cunningham & Lochmiller, 2019). Principals with content knowledge suggested feedback specific to the content.

Principals need to see the need for LCK. Lochmiller and Acker-Hocevar (2016) determined that support of mathematics instruction needs specific content-centered feedback, more than general pedagogical feedback. LCK enables school principals to analyze and diagnose specific professional development within the content area for teachers (Rigby et al., 2017). As well as principals with LCK identified the appropriate manner and design of professional development needed content area teachers (Cunningham & Lochmiller, 2019). With content-specific leadership, school principals differentiated the needs of teacher professional development (Cunningham & Lochmiller). Principals who chose to learn with their teachers as co-learners in content-specific professional development increased their credibility with teachers in content and instructional practices (Hitt & Tucker, 2016; Rigby et al., 2017). Teachers had professional respect for principals with LCK.

The need for content specific leadership had become increasingly vital with growing accountability, wider achievement gaps, and stagnant student achievement. Scholars found that as strong instructional leaders, school principals need LCK (Lochmiller & Acker-Hocevar, 2016; Shaked, 2018). School principals who had LCK emphasized the quality of mathematics instruction, content standards, and students' performance (Rigby et al., 2019). LCK led to a more profound emphasis on teacher instructional practices and what specific professional development was needed to grow the teacher (Steele et al., 2015). Principals' increased their LCK through content-rich professional development (Boston et al., 2017). LCK is measured and can improve.

Measure of Academic Progress

The Northwest Evaluation Association (NWEA) provided school districts with a norm-reference assessment to measure proficiency and student growth over time, the Measure of Academic Progress (MAP) Growth (Kuhfeld, Domina, & Hanselman, 2019). MAP Growth is a digital-based adaptive assessment. Assessment items were modified based on student responses to measure proficiency accurately. Student progress measured happened three times a school year, the beginning of the year, the middle of the year, and the end of the year. The MAP Growth assessment results determine students' RIT scale scores. Students are then ranked nationally using corresponding normative percentiles and to determine proficiency as measured by state standards. Assessing students three times in a school year allows administrators to measure growth and assess progress. Strong instructional leadership fostered students' learning by implementing MAP Growth and interventions (Goddard et al., 2015). In addition to MAP Growth, NWEA provided

MAP Skills, a mastery measure web-based intervention used along with MAP Growth to identify each student's specific skill gaps. MAP Skills interventions also adjusted to each student's instructional level, whether on-grade level, below or above grade level.

Teachers used this data to reteach skills, and concepts students had not mastered. Data were the sources used to find students' strengths and weaknesses to create an intervention plan (Benders & Craft, 2016). The use of MAP data helps to target math instruction when implementing small flexible groups of guided math as an intervention (Benders & Craft, 2016). Fazal and Bryant (2019) reported that students had an increase in the MAP assessments due to targeted, individualized instruction. School principals used MAP Skills to view data through a school-wide view or classroom view, evaluating each teacher's intervention efforts. MAP Skills was a valuable tool for principals to monitor individualized instruction and interventions (Burns & Young, 2019).

Summary and Conclusions

The major headings were the themes in this literature review included: instructional leadership role of school principals, the effect of policy on instructional leadership, the impact of instructional leadership on student achievement, and the influence of LCK. Within each of these themes, there was significant research presented.

The role of the principals transitioned. Principals spent more time as managers as opposed to instructional leaders (Bouton-Wales, 2016). Instructional leadership is vital. Brown (2016) stated that effective instructional leadership increased student achievement. Within effective schools, instructional leaders led their schools' instructional programs (Brown, 2016; Cansoy et al., 2018; Gurley et al., 2016). Finally,

this study's focus was on elementary school principal's math instructional leadership, and some studies such as Lochmiller and Acker-Hocevar (2016) explored how high school principals' understanding of mathematics guided their leadership. Indeed, Principals' instructional leadership affects mathematics achievement (Tan, 2018).

The current literature regarding principals' as instructional leadership found that principals had an indirect effect on student achievement (Ozdemir, 2019) and had a significant effect on school performance (Wahyuddin, 2017). According to Mette et al. (2017), principals who focus on instructional leadership help students improve their academic achievement. The literature revealed that principals with content-specific leadership differentiated the needs of teacher professional development (Cunningham & Lochmiller, 2019).

There were several questions to which the answers were unknown regarding principals' instructional leadership. Steele et al. (2015) recommended investigating how content-specific learning influenced principals' instructional leadership practice. The role of contextual factors in instructional leadership was not studied (Shaked & Schechter, 2016). The specific instructional leadership practices that increased student achievement in mathematics (Bouton-Wales, 2016) were unknown in the literature. The one critical area that was unclear is whether LCK impacts principals' leadership, particularly in mathematics (Lochmiller, 2016). The present study attempted to fill this gap by interviewing elementary school principals who had mathematics LCK. Additionally, no studies of the qualitative nature investigating what factors hinder instructional leadership exist (Cansoy et al., 2018; Gawlik, 2018).

In chapter 3, I elaborated on the qualitative nature of this study and the rationale for a case study method to address the gap in practice of the mathematical content-specific role of instructional leadership of elementary school principals. The interview protocol aligned with the conceptual framework of instructional leadership and the participant selection pinpointed the need for a mathematical background to establish LCK. The participants' mathematical background and the conceptual framework of instructional leadership addressed the gap that few studies had focused on the mathematical content-specific role of instructional leadership of elementary school principals (Lochmiller, 2015). In Chapter 3, I presented the methodology for this study.

Chapter 3: Research Method

The research problem was that elementary school principals were inconsistently applying instructional leadership to support mathematics teachers' efforts to improve students' proficiency. The purpose of this qualitative case study was to understand how elementary school principals applied instructional leadership to support math teachers' efforts to improve students' proficiency in math. I chose a case study approach to identify instructional leadership practices of elementary principals. A case study is the best design to use when seeking to understand a contemporary phenomenon deeply and in a real-world context (Yin, 2014). In this chapter, I describe the research design; methodology, including instruments and data collection and analysis procedures; issues of trustworthiness; and ethical procedures.

Research Design and Rationale

The research question for this study was, How do elementary school principals apply instructional leadership to support math teachers' efforts to improve students' proficiency in math? This research was qualitative and involved the use of a case study research design. Ravitch and Carl (2016) noted that qualitative researchers make meaning of the experiences of the participants. I chose a case study approach to identify instructional leadership practices that effective elementary principals use to support math teachers. When research questions focus on why or how questions, case studies are ideal (Yin, 2014). A case study is an exhaustive analysis of a phenomenon in its natural context (Yin, 2014). This research's central phenomenon was the instructional leadership practices of elementary school principals who had mathematics backgrounds. A case

study was suitable for understanding how elementary school principals applied instructional leadership to support mathematics teachers in improving student proficiency in mathematics. When seeking to understand a contemporary phenomenon deeply and in a real-world context, a case study is the best model (Yin, 2014).

Role of the Researcher

My role as the researcher was that of an interviewer. As the interviewer, I prepared a list of interview questions and follow-up questions to answer the research question. Follow-up questions were to check for accuracy. I took notes in addition to recording the interviews. I sent all participants a consent form after the initial agreement but before the interview date. I ensured that the participants understood the purpose and methods of this research study and that they could withdraw their participation in the study at any time. I collected the data for this research, transcribed the interviews, analyzed the interviews transcripts, and reported my findings.

As a district elementary math coordinator, I had no supervisory role with the principals at the research site. I, on occasion, engaged principals in professional development around mathematics. To keep the principals abreast of best practices and inform them of instructional practices, they should observe as instructional leaders. Additionally, principals asked for professional development for their mathematics teachers, which I delivered. Some principals asked for individualized support for struggling teachers that I executed. I provided curriculum support to principals, such as recommendations for intervention or tutorial material. My position during this study was solely the support of principals and teachers.

As a district mathematics coordinator, I had knowledge of mathematics and experience in teaching and learning; however, I set aside my professional experiences to evaluate the themes from the collected data. I have never been an instructional leader of a school, which helped me to remain open and objective toward the data collected. To manage personal bias, I conducted bracketing conversations with office colleagues before interviewing to collect data; in these conversations, I exposed what I believe my biases were and how I planned to hide them in interviews. The goal was to become aware of my preconceptions and uncover anything that would hinder my listening to participants (see Rolls & Relf, 2006). Open-ended interview questions allowed participants to respond with their thoughts and actions to manage bias (see Burkholder, Cox, & Crawford, 2016). I hold no supervisory position with elementary principals. I kept participants' information confidential, and I was the sole owner of interview notes, recordings, and transcriptions.

Methodology

Participant Selection

The population was all elementary principals who had a math background at the research site. The sample was 12 out of 82 elementary principal participants. Principals were required to have two college mathematics courses to participate in this study. There are screener questions located in Appendix B that I asked at the end of each interview to better document the principal's math knowledge.

This case study was descriptive, and the goal was to describe the phenomenon in its context (see Yin, 2014). I sought to document what instructional leadership principals with a math background provided. The intention was to document effective math

instructional leadership; the sample of participants came from schools with at least moderate success in mathematics education. For the selection criteria, the principals needed to have a mathematics background, but this was challenging to define. I used a minimum of two college mathematics courses as the defining characteristic. I asked participants to provide a history of their mathematics courses and experiences that they felt helped their ability to provide mathematical instructional leadership. I used purposeful sampling to select participants who met the following selection criteria: (a) had been a school principal for at least 2 years, (b) was state certified, (c) worked for the school district for at least 1 year, and (d) had taken two college mathematics courses. I used purposeful sampling to identify and select participants who were information-rich when resources were limited (Patton, 2002). Participants with a math background were able to provide rich information for this study. I interviewed 12 elementary principals because this was a sufficient number to gain saturation according to Walden University guidelines. In order to recruit participants, I sent them an e-mail asking them to participate in my study.

Instrumentation

The data source was semistructured face-to-face interviews via Zoom with elementary school principals. The interview questions, found in the interview protocol (see Appendix A), were designed to answer the research question. I created the interview questions based on the conceptual framework, Hallinger and Murphy's (1985) instructional leadership theory. To promote clarity, content experts in instructional leadership and experts in student achievement provided suggestions for the interview

protocol. It was important to review the interview protocol for revisions (Maxwell, 2013). I revised the interview questions based on the feedback to increase content validity and reliability. Construct validity is the most stringent form of validity; it requires ample amounts of time with sample participants (Burton & Mazerolle, 2011). For time reasons, I used less rigorous methods such as face validity and content validity.

Procedures for Recruitment, Participation, and Data Collection

Recruitment. Initial contact with the elementary school principals was through their school district e-mail to request their participation in this case study. I followed up with a second e-mail. When participants contacted me, I reviewed the screening questions about their mathematics knowledge. If they qualified for the study, I asked them to meet over Zoom for the interview. Only elementary school principals who met the selection criteria received information regarding this study, such as problem and purpose statements, potential findings, and contact information. In the consent e-mail, I requested that they replied with “I consent.” When participants replied to the e-mail, I request their availability for an interview. I notified participants of their rights as participants and the ability to withdraw at any time without penalty. I scheduled a date to complete the interview. I ensured that participants were aware of the requirement to record interviews for transcription. In addition, I made sure that participants knew that their information would remain confidential and would be kept solely by me.

Data collection. I sent an email to identified participants who met the selection criteria to request their participation in the study. Those who did not respond to the email I sent more emails to additional potential participants until I had a large sample.

Principals who replied with "I consent" I provided the details for the interviews. I conducted interviews for this study via Zoom. I scheduled each interview for 1 hour. I informed participants of their right to withdraw from the study at any time. I used no identifying information to protect participants' confidentiality and to elicit open and honest responses. In addition to recording each interview with the permission of each participant, I took notes. I transcribed the recordings from each interview. To organize and analyze the data, I used Dedoose software. The notes contained the date, time, and information from the interview. I sent a summary of the participants' codes, definition of each code, and a quote from the transcript for the participant to do member checking. The participants emailed back if they had any changes to the codes. Participants were sent via email a thank-you letter for their participation in this research study.

Data Analysis Plan

The data analysis process was focused on the research question and aligned to the conceptual framework (Yin, 2014). Interview transcripts were organized by using Dedoose to manage the data. Emergent themes require thematic analysis. Initial coding aimed to uncover common themes and categories that arose from the data (Corbin & Strauss, 2015). Initial coding was ideal for interview transcripts to acclimate the participant language (Saldana, 2015). The first cycle of initial coding consisted of specific words or phrases, in vivo codes. While coding, I kept notes to document the meaning of codes. The second cycle of line-by-line coding was to enhance the details of the data. Next, I sorted the codes into categories and subcategories while exploring the relationship between the categories and subcategories. The categories revealed the

broader themes, and the subcategories support the themes. Any discrepant data found in the first cycle of coding were needed to understand the principal's instructional leadership and the role the school contextual factors played or as a recommendation for further research.

The open coding process, of the data, directly added to the work's validity. Another way to add to the validity of the work was to strengthen credibility. Qualitative research uses member checking to strengthen credibility (Merriam, 2009). Member checking was also called response validation, feedback given about the data collected, and conclusions from the participants (Maxwell, 2013).

Trustworthiness

Credibility

Credibility referred to the data collection method and an essential aspect of Trustworthiness (Shenton, 2004). An inductive method of coding was used to align with the exploratory nature of this research, allowed the data to produce the codes, categories, and themes. Member checking allowed participants to clarify the data collected; this established credibility in the data (Creswell, 2013). Additionally, in the role of the researcher section, I disclosed my researcher reflexivity as a way to establish credibility (Creswell & Miller, 2000). I reported my assumptions, biases, and my personal beliefs as a professional.

Transferability

Another characteristic of trustworthiness was transferability, were the findings applicable to other contexts (Shenton, 2004). To provide evidence for the reader to obtain

transferability with the findings, I described the context and participants in the participant section and data collection section. Transferability allowed the reader to judge the contextualized meaning of the research (Ravitch & Carl, 2016).

Dependability

Dependability was another crucial aspect of trustworthiness. To ensure the findings were dependable, consistent, and repeatable, I performed a code-recode procedure with the data. I transcribed and coded the data. Then waited a week to recode the same data to evaluate and align my results. The head chairperson, who was not involved in the data collection or research process, cross-checked the findings and conclusions.

Confirmability

Confirmability was key in trustworthiness to ensure the participants and not the researcher shape the findings (Rubin & Rubin, 2012). To establish the confirmability of the findings of this study, I provided a transparent description of the findings' development to explain how the themes emerged. The use of field notes established a reflexive practice (Ravitch & Carl, 2016) of my personal biases. Throughout the research process, I was attentive to my role as the researcher. I kept an open mind when collecting data from participants and allowed the data to reveal in the coding and analysis process.

Ethical Procedures

In this research, no information came from minors. I obtained preapproval from Walden's Institutional Review Board due to the Advance Education Administration Leadership (AEAL) program requirements and the qualitative nature of this study, which

involved interviews with elementary school principals. Additionally, the local school district approved the study.

All participants were sent a consent form, via email, to review before the interview date. I certified that I performed the diligence of informed consent with all participants. The purpose and methodology of this research study were made clear to participants. I ensured the participants understood they could withdraw from the study at any point. I kept a secondary list of elementary school principals with overall STAAR math performance of a C if the need arose to gain additional participants. I was the sole researcher who collected data, transcribed it, analyzed it, and reported the findings. For the confidentiality of the participants and school, I used alphanumeric names. The use of purposeful sampling produced a small sample size emphasized the need to keep confidential the principal and school names. Data were only shared during the audit trail using the alphanumeric names of the participants and school. The computer in which this information is kept on was password-protected, and analytical notes were kept in a locked desk to maintain confidentiality. No district or state archival data were used. Upon the final approval of this dissertation by the chief academic officer, I will hold all data for 5 years. I had no supervisory role with principals. I work for the same school district this study takes place in, but do not work in the same school location with any of the principals. My professional position throughout this study was solely the service of teachers and principals.

Summary

In this chapter, I gave a synopsis of the qualitative research design and rationale for this study. This research was qualitative, used a case study research design. A case study was the best model to understand a contemporary phenomenon's depth in its real-world context (Yin, 2014). The researcher's role was described in grave detail to add to the trustworthiness of this study as the interviewer. I conducted bracketing conversations to manage bias. I laid out a complete explanation of the methodology used in this study to help the readers draw their transferability conclusions. Participant selection consisted of 12 elementary school principals who had mathematics content knowledge background (see Appendix B). I addressed the forms of trustworthiness, threats to validity, and ethical procedures to show trustworthy research. The instrument used for data collection was an interview protocol, developed by the researcher with the support of an expert panel. Initial recruitment was done through email and followed with more emails for additional potential participants. I gained informed consent through email. Participants were sent a link via Zoom to participant in a conference interview. The audio recorded using the features of Zoom and, as a backup, a program on my cell phone called voice memo app. Interviews took approximately one hour, and after each interview, I immediately transcribed it. The transcripts used for data analysis used Dedoose to manage the data, and then initial coding and thematic analysis were performed. The data analysis process was concentrated on the research question to merge analysis and data (Yin, 2014). The credibility of inductive coding and member checking is a way to safeguard trustworthiness. A thick description provided of the context, setting, and participants

allowed the reader to judge transferability. To ensure the dependability of this study findings, I performed an audit trail of the data analysis. To establish confirmability, I provided a detailed and transparent description of how the findings developed. In Chapter 4, I included a detailed summation of the results, including reflections and findings.

Chapter 4: Reflections and Conclusions

The purpose of this qualitative case study was to understand how elementary school principals with math backgrounds applied instructional leadership to support math teachers' efforts to improve students' proficiency in math. The research question was, How do elementary school principals with a mathematics background apply instructional leadership to support math teachers' efforts to improve students' proficiency in math? In Chapter 4, I describe the participant setting and demographics are described; outline how data were collected, recorded, and analyzed; present the results; and provide evidence of trustworthiness.

Setting

Participants for this study were elementary principals from a large urban public school district in the United States' southern sector. I used purposeful sampling to select elementary school principals with the following selection criteria: (a) had been a school principal for at least 2 years, (b) were state-certified, (c) worked for the school district for at least 1 year, and (d) had taken two college mathematics courses. I focused on particular characteristics to identify and select information-rich participants (Patton, 2002).

Data Collection

I used a case study research design. Walden University's Institutional Review Board granted approval on May 20, 2020 (# 05-20-20-0978256). E-mails to potential participants were sent that evening, with an additional round of e-mails 5 days later. I sent consent forms via e-mail, and participants replied with the words "I consent." Data were collected from 12 elementary school principals through semistructured face-to-face

interviews via Zoom using an interview protocol (see Appendix A). Interviews took place within a 2-week time frame. I conducted the interviews in my home office in an enclosed space to maintain confidentiality. I used two methods to record the interviews: the voice memo app on my cell phone and the audio recording of Zoom. In addition to recording the interviews, I took notes during the interviews, and after each interview, this was a portion of the first cycle of coding (see Merriam & Tisdell, 2016). Zoom provided an initial transcription of data. I listened to the audio recordings and made corrections to the transcripts after each interview. To keep the participants' identity and name confidential, I used an alphanumeric naming system, P1-P12. I reached data saturation when no new information came about during the interviews (Creswell, 2013). No participants requested to change their transcripts. I sent a thank you note to each principal who participated via e-mail a few days after each interview. There were no variations in the data collection or unusual circumstances.

Data Analysis

I analyzed the data first by reading all the interview transcripts, which provided a general sense of the data (Creswell, 2013), and taking notes from this first reading. To analyze the data, I used thematic analysis. Codes were derived using single words or phrases from analyzing the data (Ravitch & Carl, 2016). In vivo codes were used in which the exact words and phrases of interview participants were taken (Saldana, 2015). Table 2 shows the common in vivo codes. After reading through all the interviews and performing the first initial codes, I grouped similar codes from each interview (see Table

3). I reduced the list to a smaller, more manageable list of codes (Creswell, 2013). Based on the group similarities, I generated the categories for the next cycle of coding.

Table 2

First Cycle Coding

Interview questions	Codes
1	Students to made growth. Build relationships with the community. Consistently met in professional learning community, PLC. Quality instruction. Student achievement. Improve the school culture.
2	Communicate with our site base decision committee (SBDC). Newsletters. Public displays of goals and data. Communicating in PLC.
3	Met in PLC to study the student work. Alignment to the district curriculum frameworks. Looked at the data. Check lesson plans. Observed classrooms. T-TESS. Used walk-throughs and feedback. Coaching conversation and feedback.
4	Looked at assessment data. Used the state mandated T-TESS. Data from Walk-throughs.
5	Vertical planning meetings. Other resources and realigned the scope and sequence. Unpacked the standards in PLC. Relied on what the district provided. Team planning. Feedback.
6	Data from district assessment. Used data. Weekly formative assessment data. Public displays of data. PLC meeting. Looked at data for individual students.
7	Consistently focus on the goal. Conversation about accountability. Consistent PLCs to analyze student work. Hold teachers to the data. Check lesson plans.
8	Limit interruptions. Live by the master schedule. Detailed lesson plans with time increments. Time on task. Observed classrooms.
9	Planned for professional development throughout the year. Encouraged teachers to sign up for district PD. Led by our teachers. Based on goals and needs from PLC. Teacher buy-in.
10	Being all over the building, halls, lunchroom, arrival & dismissal. Visited every classroom each day. Built relationships. Stayed out of the office. Planned classroom visits on the schedule.
11	Incentives were a work in progress. Teachers loved jean passes. Notes of appreciations. Public recognition and praise. Shout-outs during meetings. Gifts of time. Gift cards or prizes.
12	Tickets for the treasure box. Shouts on the announcements. Public displays when students reached a goal. Lots of prizes. Pizza or Popcorn parties. Points system.
13	Followed a real PLC. Responsive to the data. Worked with the community. A leader who knows the standards and quality instruction.

Table 3

Second Cycle Coding

Codes	Categories
<ul style="list-style-type: none"> • Accountability • Walk through • T-Tess • Assessments • Data meeting • Public displays • Data • Observing • Student progress • Goals • PLC • Teacher feedback • Based on needs • Coaching • Analyze student work • Planning • District requirements • Lesson plans • Formative assessments • Quality instruction • Building relationships • Communication/Conversation • Community • Teacher led • Buy-in • SBDC • Incentives • Jean passes • Praise • Shout outs • Party • Prizes • Master schedule • All over the building • Stay out of office • Limit-interruptions • Time on task 	<ul style="list-style-type: none"> • Teacher Appraisal • Visible influences of learning • Best practices • Teacher development • Prepared and focused instruction • Establish relationships • Inspires through recognition • Inspires through motivation • Productivity • Intentional

Hallinger and Murphy's (1985) instructional leadership dimensions served as the conceptual framework for this study. I analyzed the dimensions of the conceptual framework and the categories from the data to identify the themes. I identified seven themes discussed in the results.

Results

The purpose of this qualitative case study was to understand how elementary school principals with mathematics backgrounds applied instructional leadership practices to support mathematics teachers so students can improve their proficiency. Seven themes emerged from analyzing the data, which aligned to the conceptual framework and research question. The research question for this study was, How do elementary school principals with a mathematics background apply instructional leadership to support math teachers' efforts to improve students' proficiency in math? Table 4 shows the seven themes that resulted from the data analysis and common phrases.

Table 4
Data Analysis Results

Codes	Categories	Themes	Theme Statements
<ul style="list-style-type: none"> • Accountability • Walk through • T-Tess • Assessments • Data meeting • Public displays • Data • Observing • Student progress • Goals • PLC • Teacher feedback • Based on needs • Coaching • Analyze student work 	<ul style="list-style-type: none"> • Teacher Appraisal 	<ul style="list-style-type: none"> • Practices to evaluate teaching and learning 	Instructional leaders evaluate teaching and learning.
<ul style="list-style-type: none"> • Planning • District requirements • Lesson plans • Formative assessments • Quality instruction 	<ul style="list-style-type: none"> • Visible influences of learning 	<ul style="list-style-type: none"> • Maintained focus on student achievement goals 	Instructional leaders maintain focus on student achievement goals.
<ul style="list-style-type: none"> • Building relationships • Communication/Conversation • Community • Teacher led • Buy-in • SBDC • Incentives • Jean passes • Praise • Shout outs • Party • Prizes • Master schedule • All over the building • Stay out of office • Limit-interruptions • Time on task 	<ul style="list-style-type: none"> • Best practices • Teacher development 	<ul style="list-style-type: none"> • Builds capacity and pedagogy 	Instructional leaders manage instruction, builds the capacity and pedagogy of others.
	<ul style="list-style-type: none"> • Prepared and focused instruction 	<ul style="list-style-type: none"> • Routines for developing quality instruction 	Demonstrates instructional leadership through routines for developing quality instruction.
	<ul style="list-style-type: none"> • Establish relationships 	<ul style="list-style-type: none"> • Fosters positive internal and external relationships 	Demonstrates instructional leadership by fostering positive internal and external relationships.
	<ul style="list-style-type: none"> • Inspires through recognition • Inspires through motivation 	<ul style="list-style-type: none"> • Recognizes the efforts of others 	Instructional leaders promote a positive school learning climate by recognizes the efforts of others.
	<ul style="list-style-type: none"> • Productivity • Intentional 	<ul style="list-style-type: none"> • Strategic management 	Instructional leaders maintain high visibility through strategic management.

Theme 1: Evaluates Teaching and Learning

As instructional leaders, the first theme was that *principals evaluate teaching and learning*. All the principals used walk-throughs as a formal or informal process to provide teachers with feedback. Walk-throughs are ways elementary school principals evaluate teaching. Several principals talked about the walk-through, feedback, conference cycle. One principal explained this is where she would walk-through a classroom and take notes on improvement areas. Then she provided feedback to the teacher in a conference, where they discuss different ways to implement strategies from the feedback. This process continues, as the principal does another walk-through to determine if the feedback is implemented. P6 acknowledged, "Well, by walk-throughs and watching them provide instruction, and I looked for differentiation, solid small group teaching, I looked for number talks." P10 shared, "By the student success, the success rate. That is the bottom line. We have work to do." When specifically asked, "How do you evaluate your mathematics teachers?" Seven out of twelve principals mentioned the state-mandated Texas Teacher Evaluation and Support System (T-TESS) used to evaluate teachers, and the remaining principals reported informal measures to evaluate teaching and learning. P12 stated, "We use T-TESS, which is the state-mandated evaluation." P11 added, "I align it with T-TESS as well as our three goals for our campus to see where we are, and the student needs as well. T-TESS plays a huge part." P4 stated an informal measure, "We were in the classrooms all the time, and we met in PLC."

As part of the first theme *principals evaluate teaching and learning*, elementary school principals hold teachers accountable in data meetings based on assessments. These

principals relied on the data to paint the picture of successful learning in their building. Many principals noted that with the current change in accountability scores/grades for campuses, a principal has to focus on growing every student, so when they look at data, they differentiate it down to individual students. P2 listed several assessments he used provided by the district to know how individual students are performing. "Through the benchmarks, the interims STAAR, we have MAP Math and Pathblazers." P4 spoke about how she keeps track of individual student data, "We spreadsheets, spreadsheets, spreadsheets, we have all of our students' data in spreadsheets. We look at the data, and we make sure that every student is making their games."

In summary, for this theme, it is clear that to ensure teachers were accountable and responsive to the data, some principals did informal walk-throughs, taking mental notes of teaching and learning. As instructional leaders, effective principals focus on evaluating teaching and learning. They evaluate teaching through classroom walk-throughs and learning is through assessment data and how individual students are performing.

Theme 2: Maintains a Focus on Student Achievement Goals

All principals interviewed had school goals tied to some form of student achievement as measured through the growth of students or overall school performance. All the principals posted these goals, some in data rooms, and others in the main hallways, as public displays to ensure it remained a focus as identified in the second theme and for parents to be aware. P10 indicated, "Our goal this year was at least 85% of students on or above grade level in math." Principal P10 gave a formal account of his

campus goals while other principal participants stated their goals without a specific percentage attached to the goal. P7 said, "I have lots of goals for my schools, but primarily, I think, as we all know, it is to try to close that achievement gap." P1 statement agreed with P7, stating, "Student progress." P4 declared, "The goal for the school was to hit growth for every child." P8 expressed her campus goals in both overall performance and growth goals for students, "My goals are student achievement first and foremost. Breaking it down into grade-level goals, STAAR targets, percentage of students hitting their reading level in lower grades to access the math, to hitting all the academic goals we sit for kids." P4 also stated, "We do not post it by a kid, but we post it publicly in the hallway by homeroom for core subjects." I summed up these principals' goals as a focus on student progress. As the instructional leaders, the principal ensured progress toward these goals by observing classrooms. As instructional leaders, the goals had to be visible, and they observed classrooms for visible confirmation of progress towards the school goals. As instructional leaders, the second theme identified principals focus on making sure each student is making progress and have measurable goals tied to student achievement.

Theme 3: Manages Instruction and Builds the Capacity and Pedagogy of Others

As instructional leaders, all the principals used the third theme manage instruction, build capacity and pedagogy of others through the PLC process to meet with teachers regularly, discuss the lesson cycle, analyze student work, and access teacher feedback. Some principals alternated meeting with groups of teachers, while other principals met with teachers weekly. P11 specified, "We planned with the teachers in

PLCs as part of having them be well supported, and through those collaborative planning sessions, we were able to see what works.” P3 added, “With walk-throughs, feedback, conferencing, meetings in PLCs with the teachers.” In addition to the PLCs, a couple of principals noted they checked the alignment of the district curriculum against what the teachers were doing in the classroom, checking that teachers were teaching the standards and were not getting behind with the pacing. P1 stated, “Looking at the curriculum framework and seeing if teachers are following the curriculum framework, looking at our data and seeing how they address the students’ needs.” P8 declared, “By being in the rooms, observing instruction as it happening.” As a part of the fourth theme principals to manage instruction as instructional leaders, principals are in the classrooms often. P4 noted how she employed her instructional coaches to help manage instruction. P4 stated,

We have two instructional coaches, so I assigned them by need. We have one instructional coach who is more focused on math, which is her strength, and that is my instructional strength, so that coach and I support the teachers in mathematics, planning, PLCs, observing the math, and teaching math lessons.

P7 statement aligned with all the methods mentioned by P4, P11, and P1, “We have vertical PLC meetings with my instructional coach, and I go into the curriculum preview and look at the units or look forward and see where they are.” As instructional leaders, principals understand the importance of quality teachers and staff who are knowledgeable; they employed instructional coaches to build their teachers’ content knowledge. As instructional leaders, the principals planned for professional development for teachers in advance to ensure they build the capacity and pedagogy knowledge of

their teachers, emerged from the third theme. P3 recounted, "By building it into the schedule and helping teachers be leaders, they have some ownership and voice in what the professional learning is and how it is delivered." P2 concurred that teachers created the professional development to build their capacity. P2 conveyed, "I let the teachers take the forefront and be the lead learners and trainers of trainers."

As instructional leaders, as a part of the third theme principals manage instruction by consistently meeting with teachers in PLC. Principals use instructional coaches to build teachers' capacity and to help manage instruction. Professional development was another tool to build the teachers' capacity by allowing teachers to develop professional learning and lead the training.

Theme 4: Demonstrates Instructional Leadership Through Routines for Developing Quality Instruction

As instructional leaders, the fourth theme showed principals understand the value of the first lesson is high quality instruction. Principals spent time with teacher planning lessons, understanding the district requirements, and used formative assessment to assess learning on a daily basis. P5 reported that the standards alignment for her teachers took place during PLCs. P5 indicated, "That took place in PLC to find out what the teachers understood about that particular TEK they were going to teach for the next week or the following week, what did the students need to know." P11 also reported, "We planned with the teachers in PLCs as part of having them be well supported and through those collaborative planning sessions we were able to see what was in the district framework." Three principals declared they go a step further; as a routine, they review teacher lesson

plans each week to hold teachers accountable for quality instruction. P2 replied, "So I looked at the lesson plans every single week, I start there. See how teachers were planning and seeing what they planned to do and made sure certain elements were in their lesson plans such as formative assessment." P10 reported, "Well, the first thing I do is Monday morning is to check lesson plans." P12 revealed statements directly in line with the research, "Data, data, data, our campus has bi-weekly common assessments that our campus had created. We had bi-weekly data meetings based on the common assessments and addressed it in our lesson plan feedback cycle."

The fourth theme revealed principals have many routines to establish quality instruction. Quality instruction ensures teachers understand the standards they will be teaching and away to access the learning, such as a formative assessment. P11 said, "Our big one was the daily formative assessments because we wanted to catch it right then and there." P11 went on to say how they routinely meet in PLCs to review the students' results and discuss the next instructional steps. As instructional leaders, principals plan with teachers and use formative assessments to access learning daily.

Theme 5: Demonstrates Instructional Leadership by Fostering Positive Internal and External Relationships

The fifth themed showed as instructional leaders, principals foster positive internal and external relationship. Principals communicate and build relationships with all stakeholders. The data revealed that the principals communicated decisions to teachers and staff to gain buy-in and support. Principals that used their site base decision committees (SBDC) made certain the members were both internal and external

stakeholders. P3 stated that a committee of both internal and external stakeholders develop the campus plan, “Well, we had our site base decision committee, and we developed our Improvement Plan together; and then we made some posters to put up in the halls to make those aware who might not normally be aware.” While P8 expressed how they created goals with internal stakeholders, “We created the school goals with our staff at the beginning of the school year. Then we posted them, they are live and visible, everybody knows. We talked about them when parents come in during parent conferences.” P1 also noted she worked with internal and external stakeholders, “We do it through our SBDC.” P2 said he also worked with external stakeholders, “We had some community meeting set.”

As instructional leaders, this theme revealed principals engage the community in the school goals and the progress toward those goals through public displays. P5 stated they use a public display of information to communicate with external stakeholders “So with the school, we communicated those goals through PLCs and for the community we used all of our monthly newsletters which had our three big rocks on the front page next to the principal's corner.” P6 also used a similar public display of goals and data. P6 stated, “How I communicated that was called our school focus, and it is on all our documentation. It is part of our branding.” Some principals focused on communication and aware of goals, while others invited parents and other community members into the school for monthly coffee with the principal to build the relationship with external stakeholders. The principals related that these meeting were more that here is what is happening at the school, but went over the data, academics, and how parents could help at

home. P4 stated “We had coffee with the principal meetings throughout the year where we discussed academics.” P7 also gave an account of her coffee with the principal sessions, “So we do coffee with the principal and parenting classes. I am there helping in the sense making of what we were doing. Explaining why we have this increased focus on the Texas English Language Proficiency Assessment System (TELPAS).” P9 also articulated she used coffee with the principal to engage her external stakeholders. “We had coffee with the principal. I would talk about the campus improvement plan having those three goals, those three focus areas for the parents that wanted more information.” When other stakeholders wanted to present programs to their students, principals mandated that an educational component was tied to the program. P4 declared, “For community partners we asked for an academic component.”

In summary, this theme revealed that as instructional leaders, principals communicate the school goals to internal teachers and staff and external community members and stakeholders by working with them to develop these goals and using public forms to display the goals. Principals ensure external stakeholders are aware of the goals through educating parents and the community and by required an education component with programs for students. Principals build relationships with teachers and increase school community relations with coffee with the principal.

Theme 6: Promotes a Positive School Learning Climate by Recognizing the Efforts of Others

As instructional leaders, the sixth theme was that principals promote positive school learning climate by recognizes the efforts of others. Principals promote a positive

learning environment by providing incentives for students and staff. Principals rewarded teachers for attendance, participating in community events, donating to fundraisers, or going above and beyond their duties. All twelve principals interviewed stated that teachers love jean passes to dress casual; it was easy and free. P12 stated, "For some reason, the staff loves jean passes, and I think they love it even more as they know I cannot stand them, but I gave them because they appreciate being able to dress down a little bit." P10 agreed she was not a jeans person but used them to reward her staff. "They like jean passes for some reason. I am not a jeans person, but they like it, so that is one of the main ways." Principals also incentivized teachers with gifts from donations and gifts of time, additional lunchtime, or extra planning time. P1 replied, "I am always trying to get PTA to donate something." P6 also conferred, "I have a super supportive PTA, and I have people that are always requesting donations and gifts from the community." P7 spoke about ways she incentivizes with time, "They get a little coupon book that says I get to miss a staff meeting or come 30 minutes late or cut or leave 30 minutes early." P10 also expressed that she gives gifts of time, "If they go over and beyond, we give them a jean pass or 30 minutes or an hour of extra planning, or 30 minutes extra lunch." One principal was fortunate to have a donor that donate gift cards to her staff. P12 disclosed, "We are privileged enough where I have a donor who will donate gift cards."

As a part of the sixth theme principals promote a positive school learning climate by recognizing the efforts of others, principals give students a variety of incentives, also. Principals reward students for perfect attendance, good citizenship, grades, and meeting growth goals. P10 expressed one way their school recognized their students at no cost

and easy to implement, “We recognized students’ achievements on announcements.” For students, P6 reported, “Calling their names on the announcements, letting them take on leadership roles.” P3 mentioned the importance of addressing concerns privately and public praise to keep a positive school climate and culture. P3 said,

I try to praise in public and discuss concerns in private and other incentives like little notes of encouragement for staff. For students, we do tickets for them to come into the treasure box in the office. They moved those at different points throughout the year. They came to the treasure box for that too.

They earn responsibilities, like in fifth grade, they serve on the safety patrol.

P12 affirmed,

For us, it was the culture of the school because it was not always a positive place to come, we started with changing the way our students and our parents viewed and valued our school to the point where the culture now is so rich that people do what is in the best interest of our school and the best interest of our students.

P1 also stated, “We did attendance boards in the front, we did announcements over the speaker about those kids that were doing well, who achieved different recognitions.”

In review this theme revealed that instructional leaders inspire students and staff through incentives. Principals reward students for coming to school consistently, having good behaviors, making good grades, and making progress on academic goals. Teachers

are rewards for perfect attendance, giving up their free time to attend community events sponsored by the school or community, and through fundraiser contest.

Theme 7: Maintains High Visibility Through Strategic Management

The seventh theme was instructional leaders maintain high visibility through strategic management. Instructional leaders were visible throughout the school building and used various strategic methods to manage instruction, such as the attention to detail given to the school's master schedule, intentionally plan their time and have a high awareness to stay out of the office. P9 acknowledged,

I had an Outlook schedule where I blocked off things, this was going to be my office time, this was going to be walk-through time, this was my PLC time, and I tried to remain faithful to it. I have a philosophy; what gets planned and gets scheduled gets done. If you do not plan it and schedule it, it might not get done.

P11 also indicated she used a schedule and outlook calendar to ensure she saw teachers on a biweekly schedule to observe them teaching. P11 stated, "I had a master schedule, and every required component was on there, and I do not let anything get between it."

P11 continued with she was very stingy with instructional time and her time. She was not bothered by the responses of others; nothing comes before instruction. While P8 stated, she strategically used systems for every aspect of how things function within the school. P8 reported,

I think we were system driven here. We were very organized about what we did, so from the way you were going to get your picture scheduled, to the way you were going to do lesson plans, the way you were going to provide interventions, it

was all very organized and thought out. I think that when we looked at data, we did it with a microscope for each child.

In conclusion, for this theme as instructional leaders, principals use various strategic management tools to lead and remain visible throughout the building. Principals limit interruptions to instruction as one way to progress toward the goal of student achievement. Principals value time on task and plan every minute on the school master schedule to maximize instruction.

Evidence of Trustworthiness

In qualitative research, trustworthiness occurs through four aspects credibility, dependability, transferability, and confirmability. I established credibility for this study through member checking. I emailed the 12 interview participants a copy of the data, interpretations, and tables to check for errors, clarify statements, or include additional information. I gave participants a week to respond. Member checking was often used in qualitative research to validate findings (Roberts, 2010).

Transferability refers to the evidence that research findings could apply to other populations or similar contexts (Shenton, 2004). This qualitative study's twelve participants were a diverse group of elementary principals who selected through purposeful sampling and provided detailed, rich descriptive responses to the open-ended interview questions. Additional information was given about the participants' mathematical background knowledge to determine their LCK.

After giving the participants a week to comply with the member checking of the results, I coded the data again to align and evaluate my results to ensure dependability.

No discrepant cases existed in the data. Each participant had the same interview protocol. By observing the original research design, I addressed dependability (Ravitch & Carl, 2016). Interview participants took part in two types of member checking, once reviewing their transcripts and secondly after the data analysis. I used cross-checking to confirm the data analysis. Cross-checking or intercoder agreement where another researcher used the same data agreed on the codes used (Creswell, 2013).

Summary

The purpose of this case study was to understand how elementary school principals applied instructional leadership to support math teachers for students to improve proficiency in math. Using thematic data analysis, I identified seven themes that emerged aligned to the functions and dimensions of instructional leadership's conceptual framework and provided the answer to the research question. The themes were: instructional leaders (a) evaluate teaching and learning, (b) maintain a focus on student achievement goals, (c) manage instruction, build the capacity and pedagogy of others, (d) have routines for developing quality instruction, (e) foster positive internal and external relationships, (f) promote a positive school learning climate by recognizes the efforts of others, and (g) maintain high visibility through strategic management. In Chapter 5, I conclude this study with a discussion on the interpretation of the findings, limitations to the study, and recommendations. In addition to the implications for positive impact to social change as an outcome of this study.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this qualitative case study was to understand how elementary school principals applied instructional leadership to support math teachers' efforts to improve students' proficiency in math. I interviewed 12 urban elementary school principals to accomplish this goal. To examine elementary school principals' instructional leadership, I conducted a qualitative case study.

I concluded that a qualitative case study research design was most suitable to develop a comprehensive understanding of how elementary school principals applied instructional leadership to promote math achievement. Qualitative researchers make meaning of the experiences of the participants (Ravitch & Carl, 2016). Yin (2014) noted that case studies involve an exhaustive analysis of a natural context phenomenon. This research design required a specific group of elementary school principals. I bounded this study to this particular group of participants with mathematics LCK knowledge within one school district.

Data analysis yielded seven themes that aligned to the functions and dimensions of the conceptual framework of instructional leadership and served to answer the research question. The themes reveal that principals set goals based on student achievement and communicate these goals with all stakeholders. As instructional leaders principals maintain a high visibility and manage and evaluate instruction to focus on quality instruction and the progress toward the campus goals around student achievement. The seven themes are embedded in the job functions within instructional leadership's three dimensions.

Interpretation of the Findings

Literature is clear that effective instructional leaders improve student achievement (Hitt & Tucker, 2016; Ozdemir, 2019) and school performance (Leithwood & Azah, 2017). This study's findings confirmed the current literature on effective instructional leadership of elementary school principals. The findings revealed that elementary school principals applied instructional leadership to influence student achievement; however, the findings were not able to confirm that principals with a math background lead based on their LCK. Seven themes were revealed from the analysis of data that answered the research question.

Theme 1: Evaluates Teaching and Learning

Theme 1 aligned to the conceptual framework's second dimension, manages the curriculum and instruction, and the job function of supervising and evaluating instruction. Martin (2018) found that effective elementary school principals spent more time on curriculum and instruction. Instructional leaders focused on two functions to improve schools: teacher instruction and student achievement (Mette et al., 2017). The elementary school principals I interviewed did this by visiting classrooms, holding teachers accountable, facilitating data meetings, and evaluating teachers using T-TESS, the state evaluation system. Mazzoni (2017) showed that principals were effective instructional leaders by providing feedback on formal evaluations. P1 added that she supervises math instruction through feedback, "By giving feedback to teachers as we meet with them every week in our PLCs." Lochmiller and Mancinelli (2019) found that evaluation policy increased the number and quality of classroom observations principals performed. P10

expressed how she had to schedule her time due to the number of observations she had to complete. She said, “We have proration guides. Tier one teacher, you get this many observations, tier two, you have many observations. For the teachers that were struggling more, they got a lot more.” It was evident from the interviews that instructional leaders spent a fair amount of time each day doing walk-throughs to provide teachers with feedback. Lynch, Chin, and Blazar (2017) found a positive correlation between classroom observations and student achievement.

Theme 2: Maintains a Focus on Student Achievement Goals

Theme 2 directly aligns with the first dimension of instructional leadership, defines a school mission. This theme was confirmed in Murphy et al. (2016) who found that school principals set school goals as a direct result of instructional leadership. P4 said it best,

We needed 50% of our kids to be at meets to know that we could solidly keep our B school, which that 50% sounds terrible. But that is the means average, which means would be like 75% approaches, and then we want to be at 20% masters. Establishing and communicating school goals is one of the most imperative leadership practices to impact student achievement (Dixon, 2015). Data analysis revealed that principals applied this practice by establishing goals based on data, staying abreast of student progress, having displays of data and goals, and observing classrooms for progress towards goals. As instructional leaders, they see a clear need to set school goals around student achievement that are sustained throughout the school year.

Theme 3: Manages Instruction and Builds the Capacity and Pedagogy of Others

Under these two dimensions, the job functions that instructional leaders applied were supervising and evaluating instruction and promoting professional development. Providing teachers with feedback, developing PLCs, and coaching teachers were specific job functions performed by the elementary principals interviewed. Campbell et al. (2019) reported that instructional leaders effectively improved student outcomes by bolstering teacher practice, purposeful professional development, and strong relationships. P8 stated that she does not promote outside professional development because she would rather her teachers receive PD on the campus that is intentionally designed for them. P8 verbalized, “If they have professional development requirements that they need to go to the district to meet those then great. I hope they get some good information. But really, we are promoting your growth right here on the campus.” Principals who are instructional leaders manage classroom instruction and build others’ capacity for teaching and learning pedagogy (The Wallace Foundation, 2013). P11 reported how she worked directly with teachers, “We planned with the teachers in PLCs as part of having them be well supported.” Principals who took an active part in PLCs improved teacher collaboration and student achievement (Voelkel & Chrispeels, 2017). P6 spoke about how she used data from analyzing student work in PLCs and set a goal with both the teacher and student: “I take part weekly in each grade level PLC, and I listen. I also look at students’ work with teachers and with students and then I goal set with students and teachers.” Hayes and Lee (2018) reported that principals, as instructional leaders, use the PLC process to develop teachers’ data-driven instructional approaches to improve instruction

and support student learning. Instructional leaders utilize instructional coaches' support to improve math instruction (Anderson & Wallin, 2018). P4 stated how her coaching style was different from the formal process her instructional coaches use: "My assistant principal and I do a lot of in the moment coaching, but my instructional coaches follow really good coaching protocols."

Theme 4: Demonstrates Instructional Leadership Through Routines for Developing Quality Instruction

Theme 4 aligns with managing the curriculum and the instruction job function of coordinating the curriculum. Mette et al. (2017) showed that elementary principals' instructional leadership focused on the intersection of improved teacher instruction and student achievement. Interviews revealed that elementary school principals did this by ensuring quality instruction through planning, lesson plans, and formative assessments. P12 disclosed her weekly routine of examining lesson plans: "We look at the lesson plans of our teachers every single week, and we give feedback on the lesson plans." Yuan and Zhang (2016) noted that principals demonstrate instructional leadership through promoting of quality lesson plans.

Brown (2016) investigated the instructional leadership skills of high performing elementary school principals to examine what actions increase student achievement; the findings revealed principals led data-driven instruction efforts, led the development of common assessments, PLCs, standards alignment, and enforced schedules of uninterrupted instruction. P6 explains how they create common lessons and assessments,

"We build lessons like common lessons from the standard or district unit and campus-based common assessments to make sure that every kid can gain mastery of that skill."

Theme 5: Demonstrates Instructional Leadership by Fostering Positive Internal and External Relationships

Theme 5 aligns with the first dimension of the conceptual framework; it defines the school mission within the job function of communicates the school goals. Davis and Boudreaux (2019) noted that promoting a resounding vision through diverse communication styles with all stakeholders ranked high among instructional leadership perceptions. Participants stated they did this by building relationships, working with the community, and site-based decision committees made up of all stakeholders. P3 remarked, "Well, we have our site base committee, and we developed our Improvement Plan together."

As instructional leaders, principals understand the importance of engaging all stakeholders, both internal and external relationships (Dixon, 2015). P6 indicated she polled all stakeholders for ideas and looked at the school data to determine professional development. P6 explains

We created a plan with the team to roll it out to the rest of the school. I take stakeholder input, site-based committee meetings, and my campus leadership team. In PLC, I listen to see what they talk about, what they think we need, and then also based it on data areas that we need to get stronger in and go from there.

Harris, Wyatt-Smith, and Adie (2020) found that public displays of data help stakeholders maintain a focus on the goals and track progress towards the goal. P8 speaks

about why she posts the school goals, “We create the goals with the staff at the beginning of the school year. Then we post them, so they are live and visible, so everybody knows.” P5 articulated, she hopes her teachers continue the work of the data boards even in her absence. “I hope in my absence they continue with the data boards. With the visible data boards and then take that to the next level.” I noticed that some principals post the school goal derived from school data, and other principals display the assessment data for all stakeholders, which is a very transparent way to lead.

Theme 6: Promotes a Positive School Learning Climate by Recognizing the Efforts of Others

Theme 6 promotes a positive school learning climate by recognizing others' efforts aligned to the third dimension, and the job functions provide incentives for students and teachers. Instructional leaders established high expectations and incentivized students and teachers to progress towards goals and achievement (Hallinger & Wang, 2015). P5 was excited to explain the incentives students can choose. "Students got a chance to choose a book from scholastic, we have popcorn parties, a movie party, at different incremental stages there was some type of gift or time they could spend with popcorn or pizza." Data analysis revealed principals' do this by praising students over the school announcements, parties and prizes for students, and jean passes for teachers. P8 explains how she recognizes teachers, "We give a monthly recognition, we do it at a faculty meeting. We are very specific about why and not just they are doing a great job." Sharing the school goals and recognizing progress towards those instructional learning goals consistently, had a positive effect on school climate and overall health (Parlar &

Cansoy, 2017). Schools with effective instructional leaders had a positive school climate and improved student achievement (Sebastian, & Allensworth, 2019). P12 noted she felt like improving the school culture was the one thing that has sit the campus apart in student achievement.

For us was the culture of the school because it was not always a positive place to be. It started with changing the way our students and our parents viewed our school and valued our school. To the point where the culture now is so rich that people do because they want to because it is in the best interest of our school because it is in the best interest of our students. I know it sounds simple, but it is not that simple to change the school's culture, but that was, in my opinion, most impactful for us.

I think this theme is the foundation of learning, a safe environment, and a positive climate to learn, providing teachers and students with incentives as recognition is a way instructional leader can inspire others.

Theme 7: Maintains High Visibility Through Strategic Management

Theme 7 aligns with the dimension, promotes a positive school learning climate. Two job functions were embedded in this dimension from the data, maintains high visibility, and protects instructional time. Dixon (2015) found that communicating high standards and protecting instructional time as essential leadership practices for improving student achievement. P2 reported that the teachers always checked the teachers' classroom schedule when doing observations to ensure they were on task. "We have a

schedule on the outside the doors.” P5 used the same method to hold teachers accountable and ensure the instructional time of students was protected. P5 stated

Each teacher has a schedule that would have aligned to what the district set out for the time structure for mathematics and for all the content areas time blocks. So when I walk through our walk by classroom, I should know based on the schedule where that teacher is.

Principals protect classroom instructional time (Brown, 2016; Cansoy et al., 2018; Davis & Boudreaux, 2019). Elementary school principals did this by adhering to a master school schedule, limiting instructional interruptions, and staying out of their office. These seven themes aligned to the instructional leadership conceptual framework; the participants were elementary school principals with mathematics LCK to answer the research question. Examining the conceptual framework found in Table 1 each theme describes a dimension or a job function of the conceptual framework. Theme 1, instructional leaders evaluate teaching and learning aligned to the conceptual framework second dimension, manages the curriculum and instruction, and the job function of supervising and evaluating instruction. Theme 2 instructional leaders maintain a focus on student achievement goals, which directly aligns with the first dimension of instructional leadership and defines a school mission. Theme 3, instructional leaders manage instruction, build the capacity and pedagogy of others. Under these two dimensions, the job functions that instructional leaders applied were supervising and evaluating instruction and promoting professional development. Theme 4, instructional leaders have routines for developing quality instruction, aligns with managing the curriculum and

instruction job function of coordinating the curriculum. Theme 5 demonstrated that instructional leadership by fostering positive internal and external relationships aligns with the first dimension of the conceptual framework; it defines the school mission within the job function of communicates the school goals. Theme 6, instructional leaders, promotes a positive school learning climate by recognizing others' efforts aligned to the third dimension, and the job functions provide incentives for students and teachers. Theme 7, instructional leaders, maintains high visibility through strategic management, aligns with the dimension, promotes a positive school learning climate. Two job functions were embedded in this dimension from the data, maintains high visibility, and protects instructional time. School principals manage and lead their schools through instructional leadership. The interview protocol used the instructional framework to align the questions. Data analysis was clear and evident that principals apply instructional leadership with math teachers. However, I conjecture that principals perform other practices to support math teachers that were not uncovered due to the alignment and design of this study.

Table 5 shows the additional math background questions asked of each participant. Appendix B has the full questions listed. The mathematics background questions give us some insight into the background and math experiences of the principals.

Table 5

Mathematics Background of Principals

	a) college or university course work	b) from 1-10 level of MCA	c) math trainings or conferences attended	d) who helped you acquire math knowledge	e) attribute math content knowledge to
P1	Algebra 1	7	within the district	teachers	teachers
P2	Algebra 1 and Algebra II	6	focused on math and reading the two pillars	Peers	math coach
P3	I took 3 years of math in college	9	Within the district	teachers	Teachers
P4	Algebra 1 and Algebra II	8	Yes, one focus on math only it was three or four year	Mentors	Myself as a classroom teacher
P5	Algebra & advance math	8	Nothing	Mentors	the math department
P6	Yes two basic math courses	5	I have not	teachers	My teachers
P7	Basic math and algebra	5	I have	peers	I'm self-taught
P8	Algebra & pre-cal	9	No, nothing stands out	Colleagues through conversations	Colleagues and teachers
P9	Two basic math classes	5	No	Peers	Peers
P10	I had to take 2 basic required math courses	8	I have, do not recall exact names of those trainings.	the math department	Good teachers growing up
P11	Algebra & another math	6	Yes, with some of my math teachers	Combination of teachers	It came nature to me
P12	Calculus stats	7	No, I haven't.	teachers	Colleagues

Limitations of the Study

One limitation of this study was transferability due to the varying contextual factors and demographics of a large urban school district that elementary school principals face and the impact these factors may have on how instructional leadership is applied. Hallinger (2018) study affirmed the importance of observing leadership in context, as it shapes leadership practices. Another limitation to this study was research design, the behaviors and actions of the principals were self-reported. How a person viewed themselves was often not linked to their actions (Brutus et al., 2013). Teachers or other staff members might report different actions or behaviors of the principal or observe the interactions of the real lived experience of elementary school principals. Another limitation of this study was that the elementary principals interviewed did not have a strong mathematics background. I did not ask them how their math background impacts their instructional leadership. Additionally, this study was limited and did not compare the principals' math background to principals with less or no math background to inform the role that mathematics background knowledge plays.

Recommendations

The findings include seven themes of how elementary school principals with a mathematics background applied instructional leadership to support math teachers for students to improve their proficiency in math. A first recommendation for further research is to exam one dimension of instructional leadership, managing the curriculum and instruction to focus on teaching and learning components using a comparative qualitative case study of elementary school principals with LCK and without LCK. The

findings would compare the different behaviors and actions; the comparison would provide more detail on what principals with LCK do differently.-A second recommendation is to include LCK as a conceptual framework or use LCK as a standalone conceptual framework. Additionally, I recommend two sources of data to mediate the self-reporting nature of this study. I suggest interviews and observations to determine how principals apply instructional leadership.

Implications

The implications for positive social change for this study included how elementary school principals use LCK to apply instructional leadership practices better to support mathematics teachers so that students increase their proficiency in mathematics. Branch et al. (2013) reported “Teacher quality was an important pathway in which principals affect school quality” (p. 66). The literature clearly showed that effective school principals increase student achievement (Day et al., 2016; Hallinger & Wang, 2015; Hitt & Tucker, 2016). The findings of this study can be applied to improve academic outcomes. The principals used and recommended an observation feedback cycle. This cycle consists of the principal observing the classroom instruction, conferencing with the teacher afterward to discuss instructional improvements, then revisiting the classroom to determine the progress. This cycle continues; it offered a way for the principal to work directly with individual teachers to improve their pedagogy skills and instructional quality. Additionally, the data revealed that all principals used data to monitor student progress and spoke about the importance of building relationships with students, teachers, parents, and other stakeholders. The principals, as a whole,

implemented PLC models to grow and develop teachers. In the PLCs, principals collaboratively planned with teachers, unpacked data results, developed interventions, and analyzed student work.

Furthermore, an increase in teacher quality provides students with the ability to access higher-level math courses to graduate high school. Strong school leadership fosters student learning through teacher collaboration (Goddard et al., 2015). Students who were proficient in math could access additional opportunities (Peterson, Petti, & Carlile, 2013). Understanding how elementary school principals apply instructional leadership to support math teachers for students to improve proficiency in math will increase student achievement. At the individual student level, the implications are that principals should monitor the growth and academic progress of students. At the level of working with teacher individually principals should monitor instruction through walk-throughs, offer feedback, and suggestions to improve the quality of instruction. As well as, hold teachers accountable to data driven instructional practices to reach the campus student achievement goals. At the level of working with teachers as a group, principals facilitate PLCs consistently. At the level of principal policies data should be used to ensure equitable instruction occurs for all sub groups, English language learners, special education and populations.

Conclusion

This qualitative case study explored how elementary school principals with a mathematics background applied instructional leadership to support math teachers for students to improve their proficiency in math. This study used the conceptual framework

of instructional leadership by interviewing 12 participants through purposeful sampling. The data analysis resulted in seven themes of how elementary school principals applied instructional leadership. This study was important to increase the math proficiency of the average Grade 4 math assessment score that has not been measurably different in the past decade, only 41% of students were proficient at the state level and 26% at the local level (NAEP). Literature was clear that a focus on the school principals' instructional leadership with LCK improved school performance and student achievement (Cunningham & Lochmiller, 2019; Lochmiller, 2015, 2016; Lochmiller & Acker-Hocevar, 2016; Stein & Nelson, 2003). This study concentrated on instructional leadership, how principals manage schools focusing on student achievement by defining the school mission, managing the instructional program, and promoting school climate (Hallinger & Wang, 2015). I used LCK to define principals' academic subject knowledge of the content as instructional leaders (Stein & Nelson, 2003). Since principals are responsible for all students within the school, the increase in principal quality exceeds the value of increasing a single teacher's quality (Branch, Hanushek, & Rivkin, 2013; Hitt, & Tucker, 2016).

The elementary school principal's job is multifaceted; they build relationships with all stakeholders, manage and observe instruction, promote a positive school learning environment, and attend to the needs of students, teachers, staff, parents, and other stakeholders. Throughout this study, analyzing the data and reviewing the literature, I found that instructional leadership's dimension and job functions are intertwined. Principals communicate and frame school goals around student achievement, which is at

the heart of instruction they manage by protecting instructional time or professional development goals. These are all different dimensions and job functions that principals perform as instructional leaders to increase student achievement. No one measure alone is sufficient, but in the combination of all the dimensions and job functions serve to sustain a focus on student progress and achievement.

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Appendix A: Interview Protocol

Instructional Leadership Conceptual Framework:

- a. What are your primary goals for your school?
- b. How do you communicate the school goals to the community?

Please answer the following questions about when you are working with your mathematics teachers in particular:

1. How do you supervise mathematics instruction?
2. How do you evaluate your mathematics teachers?
3. What do you do to assist in the coordination of the mathematics curriculum?
4. What do you do to monitor students' mathematics academic achievement?
5. What are some specific actions you take to enforce academic standards?
6. How do you protect the instructional time for math teachers?
7. How do you promote professional development specifically for mathematics teachers?
8. What actions do you take to maintain a high visibility?
9. What incentives do you provide for teachers? What criteria do you use for these incentives?
10. What incentives do you provide for students? What criteria do you use for these incentives?
11. Is there anything else thinking about your instructional leadership as a whole or specifically related to math that you feel has set your campus apart in increasing student achievement?

Appendix B: Mathematics Background Questions

- 1 What college or university course work did you take that concentrated on mathematics?
- 2 On a scale of 1---10, 10 being highest and 1 being lowest, where might you mark your mathematics content knowledge?
- 3 Have you attended any trainings or conferences that concentrated on mathematics? If so, do you know the names of the trainings/conferences? Was there a specific focus for the content of these sessions?
- 4 Who else has help you to acquire knowledge about mathematics, peers mentors, or teachers?
- 5 Overall, what would you attribute most to your development of your mathematics content knowledge, your learning experiences about math?

Is there anything else you would like to add about your knowledge or background about mathematics teaching or learning?