2021

Teacher and Principal Perceptions of Principal Support of Mathematical Literacy in Elementary Classrooms

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This is to certify that the doctoral study by

Erika Janene Johnson

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Walden University
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Abstract

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MA, Hampton University, 2007

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Dissertation Submitted in Partial Fulfillment

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Abstract

Although the role of the principal has shifted from manager to instructional leader responsible for teaching and learning, little is known about supports offered to elementary teachers from principals in the area of mathematical literacy. Elementary principals are inconsistent in terms of supporting teachers' mathematical literacy instructional strategies. To develop a culture of mathematical understanding, principal support is required. The purpose of this basic qualitative study was to explore elementary school principals' and teachers' perceptions of supports offered by elementary principals to teachers in the area of mathematical literacy. The conceptual framework for this study was Burns' transformational leadership theory. The research questions developed for this study involved perceptions of principals and teachers with regard to principal supports offered to teachers in the area of mathematical literacy in the mathematics classroom. Semi-structured Zoom interviews were conducted with seventeen participants, nine elementary principals, and eight elementary teachers. Data were analyzed and coded using hand-coding and NVivo to identify themes and patterns to answer the two research questions. Findings of the basic qualitative study suggested that supports offered by elementary principals to teachers in the area of mathematical literacy included collaborative conversations through colleagues, distributed leadership through a math instructional lead teacher, and professional development support from the math department. Implications for positive social change include practices and strategies principals can use to motivate teachers to implement mathematical literacy strategies in the classroom.

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Dedication

I proudly dedicated this dissertation to my parents Edward and Elaine Johnson. From a young age, they instilled in me the importance of a quality education and how to chase my passion with hard work, dedication, and perseverance. Their encouragement and support have motivated me to accomplish my dreams. I love you both unconditionally!

Finally, I give praise and honor to God. For the physical and mental endurance that was given to me each week to complete this journey. “So do not fear, for I am with you; do not be dismayed, for I am your God. I will strengthen you and help you; I will uphold you with my righteous hand.”

-Isaiah 4:10

Acknowledgments

I have had the great pleasure of being surrounded by educators who have influenced me professionally. Thank you to my committee chairperson, Dr. Robert Flanders. Because of your constant guidance and patience, I was able to persevere. Your quick response time, expertise, and feedback made this experience worthwhile. To Dr. Robert Voelkel and Dr. Leslie Van Gelder, thank you for your contribution throughout this process. Without the support from my committee members, this accomplishment would not have been possible.

Thank you to my siblings, Bethovan, Ebony, Erisa, and Eric, affectionally known as "Teamwork Jammers." Your encouragement and never-ending support were appreciated throughout my journey. To my precious fur baby, Koko, who spent many hours under the desk laying by my feet, thank you for being my quiet study partner and spending many restless nights with me.

My fellow doctoral partner Dr. Genevieve Cromer, thanks for being my library partner every weekend while writing. Even during a global pandemic, we managed to keep virtual library hours with each other. Your feedback, knowledge, and listening ear kept me encouraged and motivated. To Traci Walkup and Dr. Marilyn Goldsmith, thank you for your invaluable encouragement and mentorship during this process.

Thank you to the school teachers and principals who volunteered to participate in this study. Through your experiences, your love of education, and your push for academic excellence for all students were evident.

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Chapter 1: Introduction to the Study

Insufficient research currently exists involving supports for elementary teachers from elementary principals in the area of mathematical literacy. The purpose of this study is to explore elementary school principals' and teachers' perceptions of supports offered by elementary principals to elementary teachers in the area of mathematical literacy. The results of the study may bring additional data that can be transferred to other research. Data may have significance to district leaders by providing guidance and direction regarding principal supports needed from teachers for mathematical literacy. Teachers avoid teaching mathematical literacy strategies because they lack the support and understanding necessary to teach deep mathematical content knowledge (Butera et al., 2014). According to Paul (2018), elementary teachers do not use mathematical literacy strategies that experts in their field believe to be critical to mathematical understanding. To implement changes in mathematical literacy strategies for teachers, teachers need to learn about their strengths and weaknesses to improve their math literacy instructional strategies (Selling et al., 2016). Change occurs when teachers have the mindset to implement necessary changes that need to occur and support from their principals to implement what has been learned (Jacob et al., 2017).

Chapter 1 of this basic qualitative study includes the background, problem statement, purpose of the study, research questions, conceptual framework, and nature of the study. Chapter 1 also includes assumptions, scope and delimitations, limitations, significance of the study, a description of how participants' confidentiality within the study was maintained, and measures taken to reduce limitations. In the conclusion section

of Chapter 1, main ideas of the study are summarized in addition to its impact on social change.

Background

Since 2017, within Maryland, students in grades 3-5 are struggling to meet 43% proficiency in mathematics (Maryland State Department of Education, 2019). Nationally, scores within mathematics for fourth grade students were 40% in 2015, which was the lowest since 1990 (National Assessment of Educational Practice, 2018). National scores have not had a significant change in improvements since 2015. Comparatively, scores for fourth grade students in Maryland were 37% (Maryland State Department of Education, 2018), below the national average. To develop a deeper understanding of mathematics, students must be engaged in representing mathematical ideas in multiple ways to generate productive discussions (Rodriquez & Booner, 2018). Many teachers believe mathematics should be taught in isolation and involve recitation of facts and procedural steps as they were once taught. Substantial support is required to build a classroom culture that embodies mathematical understanding.

There is a gap in research regarding principal supports offered to teachers in the area of mathematical literacy to obtain mathematical understanding. Through professional development, teachers learn what mathematical literacy is and how to incorporate those strategies within the classroom (Paul, 2018). Although teachers used mathematical strategies more within the classroom, experts believed teachers did not use critical mathematical understanding strategies to build critical thinkers within mathematics (Paul, 2018). There is a lack of understanding of the perspectives of

principals and teachers regarding the supports that principals offer to implement mathematical literacy strategies within the classroom. Information obtained from this study can add to the literature and highlight support needed for teachers to implement strategies critical to mathematical understanding.

The principal's role has shifted from manager to instructional leader responsible for teaching and learning in classrooms (Rigby et al., 2017). Empowering teachers and building a supportive environment should be the role of a principal and is a viable factor in terms of educational effectiveness (Bogler and Nir, 2012). Principals should support the developmental work of teachers that empowers them to develop their professional competence (Balyer et al., 2017).

The findings of this study will add to previous research because I address the gap in the literature regarding perceptions of elementary teachers and principals about principal supports offered by elementary principals to elementary teachers in the area of mathematical literacy. This study is critical because it describes specific perceived principal supports for mathematical literacy instructional strategies.

Problem Statement

The problem this study seeks to address is that elementary principals in a northeastern state inconsistently support teachers' mathematical literacy instructional strategies. According to Ippolito and Fisher (2019), principal support lacks disciplinary literacy in math because there is uncertainty from elementary principals about how to teach and support disciplinary literacy. According to the administrator in charge of elementary mathematics in a large urban district in a northeastern state, there has been a

reduced focus by elementary principals on implementing disciplinary literacy strategies in mathematics. Compared to reading, history, and science, math teachers are least likely to be offered principal support for learning about and redefining disciplinary literacy practices in mathematics (Ippolito et al., 2017). After reviewing school performance plans at the research site, 48% of the plans had a greater focus on reading, while 52% of the plans had an equal focus on reading and math. None of the plans analyzed had a greater focus on math. According to Ippolito et al. (2017), there is greater student achievement in reading. While there is an extensive amount of research involving mathematical literacy, there is a lack of research regarding principal supports in the area of mathematical literacy.

According to Brozo and Crain (2018), teachers embrace learning about discipline-specific literacy because of its relevance to math learning compared to generic literacy strategies. Generic literacy strategies have little to do with the thinking needed to read, understand, model, and execute problem-solving strategies in math (Brozo & Crain, 2018). To develop skills necessary for mathematical understanding to execute problem-solving strategies in math, students must be engaged in representing mathematical ideas in multiple ways to generate productive discussions, critical thinking skills, and mathematical arguments (Rodriguez & Booner, 2018). Moreover, substantial principal support is required to build a classroom culture that embodies mathematical understanding.

Purpose of the Study

The purpose of this basic qualitative study is to explore elementary school principals' and teachers' perceptions of supports offered by elementary principals to elementary teachers in the area of mathematical literacy. To address the purpose of the study, elementary school principals and teachers were interviewed using semi-structured interviews exploring supports offered in the area of mathematical literacy. Information gained from this study could inform other school leaders struggling with mathematical literacy to explore principal supports given to elementary math leaders and teachers in their schools.

Research Questions

In this study, I explored elementary principals' and teachers' perceptions of the supports offered by elementary principals to elementary teachers in the area of mathematical literacy. This study was designed to address the following questions:

RQ1: What are teachers' perceptions of principal supports offered to teachers of mathematical literacy practices within the math classroom?

RQ2: What are principals' perceptions of supports offered to teachers of mathematical literacy practices within the math classroom?

Conceptual Framework

The framework for this study was based on Burns' theory of transformational leadership. Burns (1978) said leaders and teachers could work together to uplift and praise each other to a higher level of morality and motivation. According to Baptiste (2019), the transformational leadership model allows principals to create a sense of

meaning in work that teachers perform through inspiration and encourage staff with new ideas and motivation. Transformational leadership was defined by leadership behaviors that foster successful organizational change as leaders build relationships with followers (Bass, 1999). Leadership behaviors exhibited by transformational leaders move followers from self-interest to idealized attributes and behaviors, inspirational motivation, intellectual stimulation, and individualized consideration (Bass, 1999). When followers are mentored and coached by their leaders and can participate in various professional learning opportunities, individualized consideration occurs (Bass, 1999).

Followers of the transformational leader entrust the leader to do the right thing and are considered role models (Bass, 1999). Sun and Leithwood (2017) said transformational leadership is evident when school leaders emphasize building the capacity of teachers within schools. Individualized support allows leaders to listen and act as mentors while treating staff as unique individuals and supporting their professional learning (Sun & Leithwood, 2017). Individualized stimulation is demonstrated by leaders who encourage staff to reflect and evaluate individual practices and implement actions (Sun & Leithwood, 2017). In essence, transformational leadership practices have a significant influence on the competence of teachers, and their commitment to the job relates to student learning, which affects student achievement (Sun & Leithwood, 2017). School leaders who demonstrate transformational leadership sustain instructional leadership and support teachers to facilitate organizational improvement (Baptiste, 2019).

Nature of the Study

This study is a basic qualitative study based on semi-structured interviews with elementary teachers and administrators who implement mathematical literacy instructional strategies within their schools. Qualitative research usually occurs in a natural setting, and its focus is to understand or interpret phenomena in terms of individuals' accounts and meanings they bring to those accounts (Aspers & Corte, 2019). Unlike quantitative research, which involves numerical data, qualitative research generates written data that involves the meaning participants make of their human or social problems (Merriam & Tisdell, 2016). Qualitative research is vital to social sciences and understanding organizational behavior and behavior within organizations (Jonse et al., 2017). Researchers use the basic qualitative study to address perspectives, settings, and techniques (Kozleski, 2017). The basic qualitative study design allows researchers to focus on how people interpret their experiences and construct their worlds, and meanings people attribute to their experiences (Merriam & Tisdell, 2016). The purpose of this basic qualitative study is to explore elementary school principals' and teachers' perceptions of supports offered by elementary principals to elementary teachers in the area of mathematical literacy. The qualitative design was appropriate for this study because my intention was to address participants' perceptions of supports. When the goal of a study is to describe or explore a phenomenon, using a basic qualitative study is an appropriate method (Edmonds et al., 2016)

Within qualitative research, many different methods can be used to collect data. According to Merriam and Tisdell (2016), the primary data source in a qualitative

research study are interviews. An interviewer gathers data directly by asking questions (Babbie, 2017). Within qualitative research, interviews are important because they allow the researcher to identify perspectives of participants (Ravitch & Carl 2016). Interviews provide rich and individualized data for qualitative research (Ravitch & Carl 2016). A semi-structured interview approach was used to explore supports offered in the area of mathematical literacy. Participants were asked questions during the interview process regarding their perspectives of supports offered to teachers in the area of mathematical literacy. After interviews, coding strategies were used to group codes that shared similar meanings. Codes allow researchers to investigate data. Data can be analyzed into categories after coding. Categories are collections of codes labeled by word or phrase that need to be closely related to the meaning of the data (Ravitch & Carl, 2016). Categorizing codes also helps bring data collected during the coding process together (Ravitch & Carl, 2016). Themes were created when coding and categorization were combined. After coding and categorizing were completed, thematic analyses were used to develop themes from the data.

Data analysis was used to answer the two research questions for the study. The methodology process used for the study is further discussed in Chapter 3.

Definitions

This section contains definitions of key concepts used throughout the study.

Content area literacy: Language arts teachers' approaches to reading, writing, listening, speaking, and thinking in content areas (Robin et al., 2015).

Disciplinary literacy: Typical ways of thinking, doing, speaking, writing, and representing within the context of a given discipline (Robin et al., 2015).

Mathematical Literacy: Knowledge to know and apply basic mathematics in everyday living (Ojose, 2011).

Principal Support: demonstrating appreciation, providing adequate resources and information, maintaining open two-way communications, supporting collegial climates, and offering frequent and constructive feedback and appropriate professional development opportunities (Bonzonelos, 2008).

Assumptions

This basic qualitative study was conducted to explore elementary school principals' and teachers' perceptions of supports offered by elementary principals to elementary teachers in the area of mathematical literacy. This research study was based on several assumptions. The first assumption was that study participants were willing to participate, and their answers to questions were truthful and accurate representations of their perceptions. The second assumption was that teachers and principals of the study did not have any ulterior motives or gain from their participation within the study. The third assumption was that interviews were conducted in a manner that was free of bias. The fourth assumption was that participants were able to limit personal bias. Participants' willingness and truthful, honest, and bias-free answers allowed me to understand and make meaning of their experiences. The fifth assumption was that the sample size obtained from the research population was appropriate for the study. I also assumed there

would be a range in perceptions and responses given because of variations in terms of teaching and administrative experiences of participants.

Scope and Delimitations

The scope of the basic qualitative research study involved elementary math teachers and principals. The goal was to interview 8-10 principals and teachers to gain their perspectives until data saturation was complete. Interview questions for the study were developed for the specific population of administrators and teachers who met criteria. Principal participants could participate in the study if they had observed elementary math lessons and had been an elementary principal for more than three years. Elementary teachers were allowed to participate in the study based on the criteria that they taught in an elementary school. Elementary teachers in the study were also required to implement mathematical literacy within their math classroom for more than two years.

A delimitation of the study involved the sample size of only elementary teachers and principals. This sample size can limit the possibility of transferability of the results because the data analysis only refers to elementary teachers and elementary principals. Another delimitation of the study is all study participants were employed at a school district in a northeastern state of the United States.

Limitations

The researcher is the primary instrument in qualitative research. It was essential to make sense of perceived supports offered by elementary principals to teachers in the area of mathematical literacy. Qualitative inquiry is subjective (Creswell & Poth, 2018; Yin, 2016). Findings that were made are subjective and free from bias. As a researcher of this

study, it was necessary to consider my role as a math instructional leader. A researcher needs to identify biases that may influence the study's findings (Yin, 2016). It was essential to be aware of my bias before analysis. A limitation of this study was only using elementary teachers and elementary principals. Because of COVID-19, the accessibility of participants to participate in interviews was limited. Another limitation of this study involved the use of virtual interviews to capture perspectives of principals and elementary teachers. Conducting interviews virtually can potentially affect data analysis because it may be hard to capture participants' experiences because the interviewer is not able to see their body language as they would if they were to conduct the interview in person (Merriam & Tisdell, 2016).

Significance

The goal of this study was to understand supports that were offered by principals to teachers in the area of mathematical literacy. Planning for mathematical literacy begins with teachers' decisions to plan for classroom instruction (Kersaint, 2015). Effective mathematics teaching engages students in meaningful mathematic discussions to build a shared understanding of mathematics (NCTM, 2014). Principals should support the developmental work that empowers teachers to develop their mathematical understanding (Balyer et al., 2017). While there is an extensive amount of research in the area of mathematical literacy, there is a lack of research regarding principal supports for mathematical literacy. The study may add new knowledge to this topic.

This study can potentially improve the practices of teachers involving mathematical literacy. Stakeholders, including community members, district officials,

and administrators, may use the results from this study to examine whether principal supports in math meet the needs of elementary mathematics teachers. This study fills a gap in literature by providing teachers and administrators with insights regarding supports needed to implement and apply mathematical literacy strategies within the classroom. Implications for positive social change include possible modifications of supports that are needed for teachers as well as supports offered to principals to implement changes within classrooms from teachers involving mathematical literacy. This study is critical because it enables teachers and principals to voice their perspectives regarding supports needed to implement mathematical literacy strategies within classrooms. For stakeholders who are instrumental in providing supports, the results of this study may inspire positive social change relating to elementary teachers' and elementary principals' perspectives of supports offered to elementary teachers in the area of mathematical literacy.

Summary

In Chapter 1, I introduced this basic qualitative study exploring elementary school principals' and teachers' perceptions of supports offered by elementary principals to teachers in the area of mathematical literacy. The importance of the study was addressed, along with background information. The conceptual framework was introduced. I also described the nature of the study, key terms, assumptions, and significance of the study, and Chapter 2 includes the theoretical framework and literature review.

Chapter 2: Literature Review

Chapter 2 includes an extensive review of literature and research related to principal supports in math and mathematical literacy. The literature review provides the reader with peer-reviewed scholarly research and information about current research (LaVerne, 2018). Scholarly research from between 2017 and 2021 is addressed, along with earlier literature addressing meanings of principal support. The first section of Chapter 2 is a detailed description of strategies used to obtain scholarly literature from the Walden Library. This is followed by a description of the conceptual framework, the transformational leadership theory.

Literature Search Strategy

I conducted an extensive literature review involving principal support in math and mathematical literacy. I used Walden University's library resources to obtain scholarly journals using the following databases: Education Resources Information Center (ERIC), EBSCOHost, Academic Search Complete, Education Source, ProQuest Central, and SAGE Journals. I also conducted Internet searches using Google Scholar, Yahoo!, and websites of organizations, including the National Council of Teachers of Mathematics (NCTM). I also reviewed reference sections of articles and dissertations for additional sources. The search process was extensive. I set research parameters to search peer-reviewed articles and books published between 2016 and 2020, except for seminal articles. To search databases, I used the following keywords and phrases: *mathematical literacy, mathematical reasoning, numeracy, mathematical understanding, principal support, principal support of teacher,* and *principal support in math*. The search included

reviewing references from books, journals, websites, and articles related to the topic and dissertations that addressed principal support and mathematical literacy. A Google Scholar alert was used to provide updates on current literature involving topics in the study. The review of literature helped me build upon prior research in the field. Themes emerged within the literature review related to principal support and mathematical literacy, including the historical background of principal support and how it is defined.

I was able to retrieve research that defined principal supports. However, missing from the literature was extensive or current literature that specifically addressed perceived principal supports in mathematical literacy. To address the lack of research about perceived principal supports in mathematical literacy, principal supports in math were included within the study. The gap in literature was addressed in this study by exploring perceived principal supports offered by elementary principals to elementary teachers in the area of mathematical literacy.

Saturation issues were addressed by scheduling three Skype conferences with librarians from Walden University. These sessions allowed me to address additional keywords that could be used to search the topic. Walden University librarians also provided additional strategies for locating scholarly research.

Conceptual Framework

The conceptual framework for this study was Burns' theory of transformational leadership. The conceptual framework was used to further develop the alignment of the research questions with the basic qualitative research design.

Burns (1978) said transformational leadership is the opposite of transactional leadership. Burns said transactional leadership behaviors were more for managers, while transformational leaders are influential leaders who understand the importance of the leader-follower relationship. According to Burns (1978), this theory involves the process where leaders and teachers can collaborate in terms of higher morale and motivation levels. According to McCarley et al. (2016), the key to the school's success is leading the staff and students to develop shared vision, values, and goals. Bass (1999) said components of transformational leadership moved followers from self-interests to idealized attributes, idealized behaviors, inspirational motivation, intellectual stimulation, and individualized consideration. Showing purpose and assurance, setting high standards, setting an example for others to follow, and articulating how goals can be reached are examples of idealized attributes, idealized behaviors, and inspirational motivation (Bass, 1999). Intellectual stimulation encourages creativity and involves considering the input of followers and stakeholders (Bass, 1999). Individualized consideration occurs when followers are mentored and coached by their leaders and encouraged to participate in professional development (Bass, 1999). Transformational leaders keep lines of communication open to help guide and provide followers with ways to share ideas and recognize contributions followers bring (Bass, 1985). According to Bass and Riggio (2006), transformational leaders help motivate and empower their followers by aligning the needs of followers with the needs of organizations and developing their leadership capacity. Transformational leadership may result in greater teacher effectiveness because principals who practice these leadership behaviors respect

teachers' personal needs and feelings and are highly active and visible (Kouali, 2017). Leadership is transformational when leaders can transform personal concerns into efforts to achieve group goals (Bass, 1998).

Sun and Leithwood (2015) said transformational leadership is evident when leaders promote positive emotions that influence teachers' impact on teaching and learning. Leithwood and Jantzi (2000) described seven dimensions of transformation leadership: "building school vision and establishing goals; providing intellectual stimulations; offering individualized support; modeling best practices and important organization values; demonstrating high-performance expectations; creating a productive school culture, and developing structures to foster participation in school decisions" (p. 114). According to Sun and Leithwood (2017), intellectual stimulation is demonstrated by leaders who challenge staff to reflect on their practices and encourage creativity. When a leader listens to staff and acts as a mentor and not a leader by treating staff members as unique individuals and showing interest in their professional learning needs, academic support is evident (Sun & Leithwood, 2017).

According to Kouzes and Posner (2017), transformational leadership is the belief that leaders can inspire and motivate others toward a shared vision to achieve goals at a higher level. They identified five transformational leadership practices: model the way, inspire a shared vision, challenge the process, enable others to act, and encourage the heart (Kouzes and Posner, 2017). Leaders model their values and create a clear picture of what they believe in (Kouzes and Posner, 2017). Then, the leader communicates their vision and its importance to inspire a shared vision to bring into reality (Kouzes and

Posner, 2012). Challenging the process brings about opportunities for growth and change by innovating and improving people and systems (Kouzes and Posner, 2012). The idea of enabling others to act requires leaders to build relationships where people work together and focus on goals (Kouzes and Posner, 2017). The fifth practice is about creating motivation in the followers. According to Kouzes and Posner (2012), motivation to do a task increases when feedback is given on progress. These practices motivate followers to reach their highest potential.

Transformational leadership is a shared form of leadership that involves aspiration for school change (Hallinger, 2003). Marks and Printy (2003) said instructional leadership does not exist in a model without the transformational leadership capacity of the principal. For principals to lead schools through reform, a transformational leadership model is needed by principals (Marks & Printy, 2003).

Literature Review Related to Key Concepts and Variable

Having established the conceptual framework, the following literature review includes research on principal supports, principal supports in mathematics, and mathematical literacy.

Support is crucial because it allows for purposeful planning, intentional interventions, implementation of strategies, and increased student engagement (Salazar, 2016). Without support, schools may experience high turnover rates, which result in spending money to replace teachers (Djonko-Moore, 2016). Students who lack mathematical understanding deserve high-quality teachers who address mathematical literacy skills needed for mathematical understanding (Hamdani, 2017).

Principal Support

The principal's role is to empower teachers and provide them with necessary resources and support to be successful (Woszczak, 2018). It is important to understand the types of support that are needed from teachers for school improvement. House (1981) identified four types of support through his theory of social support: emotional support, appraisal support, instrumental support, and informational support. Research on social support in schools has involved job satisfaction, teacher retention, and stress. However, social support can be used for educational and instructional improvements (Cagle, 2012).

Emotional Support

House (1981) identified emotional support as the most important kind of support. Principals show appreciation for teachers and take an interest in their work by maintaining open communication (Littrell et al., 1994). Appreciation can be shown from principals by acknowledging quality teaching or via evaluations and public recognition (Woszcask, 2018). Trusting and supporting teachers' decisions in the classroom is an important consideration while leading during a time of transformation (Cagle, 2012). Emotional support includes the principal being able to provide teachers with the sense of making change and showing appreciation, trust, and support for the instructional choices teachers make (Trace, 2016).

Appraisal Support

Appraisal support allows teachers to be self-reflective and provides them with constructive feedback about their work (Litrell et al., 1994). Appraisal support can include information from evaluations after classroom observations and informal and

formal feedback. Providing effective feedback to teachers shows principals' desire for improvement and growth for teachers (Kouzes & Posner, 2017). In addition, teachers want to feel supported and appreciated by principals who trust their judgment and instructional decisions made within the classroom (Litrell et al., 1994).

Instrumental Support

Instrumental support is designed to help those who are directly in need (House, 1981). In a school setting, instrumental support can involve times for planning and providing materials and resources needed for instruction and ensuring that daily duties are distributed fairly (Trace, 2016). Principals who consistently use instrumental support focus more on completing teachers' daily activities than their emotional needs (Trace, 2016). Trace (2016) According to Trace (2016), there is a positive correlation between teachers' trust in principals and principal support. Teachers might increase their trust in principals if there is evidence of expressive and instrumental support (Trace, 2016).

Informational Support

Informational support also called professional support and involved providing teachers with information from principals that they can use to improve their classroom practices (Litrell et al, 1994). Opportunities to participate in professional development allow teachers to improve instruction or classroom management (Litrell et al., 1994). This allows teachers to enhance their skills. Professional development must be ongoing and consistent and align with schools' goals and help teachers improve their practice (Woszczak, 2018). To support staff, principals must understand how teachers' learning occurs (Cagle, 2012).

What is supportive to one teacher may not be relevant or necessary for another (Perell, 2018). Principals should balance all different types of support to reach organizational needs and bring about changes to school instructional programs (Trace, 2016).

Principal Support in Mathematics

Principal leadership and support have been linked to an increase in mathematical understanding (Baptiste, 2019). According to Baptiste (2019), the purpose of a leader is to nurture involvement and a shared commitment to more meaningful goals. Behaviors of school leaders impact behaviors and practices of teachers as well as overall performances of schools (Baptiste, 2019). It is important to understand behaviors and supports provided to teachers from school leaders (Baptiste, 2019). Principals must support more, contributing to positive cultures and changes in teachers' pedagogy and math instructional practices (Park et al., 2019). However, without content area expertise, principals find math as a more challenging subject to lead (Lochmiller & Cunningham, 2019).

Administrators are reluctant to share advice and information regarding math instruction (Lochmiller & Cunningham, 2019). They face an increasing need to improve math instruction through evaluation practices by providing meaningful feedback to classroom teachers about their instructional practices (Lochmiller, 2016). Rigby et al. (2017) said feedback that most administrators gave was not targeted to math instruction in a way that would improve their practice (Rigby et al., 2017).

Within the United States, schools are under increased pressure to reform failing math scores and increase student achievement (Boston et al., 2017). Boston et al. (2017) investigated how principals can be supported to develop the necessary skills to support teaching and learning in mathematics. Principals were engaged in a short professional development that helped principals identify high-quality instruction qualities that would allow them to communicate and provide feedback for high-quality instruction when observing lessons and providing feedback (Boston et al., 2017). The pre and post-assessments given to the administrators within the study showed significant differences in principals' observation of high-quality math instruction (Boston et al, 2017). To acquire the knowledge and actions necessary for principals to serve as instructional leaders in math, there must be a math-specific observation form (Boston et al., 2017). Administrators must be trained to effectively implement the evaluation form and promote its usage (Boston et al., 2017).

According to Lochmiller and Cunningham (2019), it is the administrator's responsibility to monitor a curricular, instructional, and assessment program that is appropriate for mathematic strategies. Puhala (2018) provided information on the administrator's role in empowering educators at their school and the support they provide. The administrator must provide an organizational condition that supports teachers' efforts to improve their practice (Lochmiller and Cunningham, 2019). Puhala (2018) showed that administrators do not support the teachers' professional development and developing their self-efficacy. Administrators can distribute leadership to teacher leaders with disciplinary literacy expertise or using resources to provide professional

development (Lochmiller and Cunningham, 2019). Administrators' support by administrators in math must be informal and formal and should include modeling, inquiry, and praise (Lochmiller, 2016). Administrator supports that do not allow teachers to make decisions about their mathematical content may result in diminished teacher capacity (Lochmiller, 2016). According to Lochmiller (2016), administrators' support in math focused on pedagogy instead of focusing on specific math content.

Math Literacy

Administrator's experiences in the classroom shaped how they viewed math instruction (Lochmiller, 2016). According to Selling, Garcia, and Ball (2016), there is an immediate need for teachers to improve their mathematical knowledge because math content knowledge and instructional strategies that foster mathematical literacy are critical to math teachers' effectiveness'. Selling et al.'s (2016) study indicated a need for teachers to learn about their strengths and weaknesses to improve their math instructional strategies because teachers could not explain how to prove mathematical problems. Teachers avoid teaching mathematical literacy strategies because they lack deep mathematical content knowledge (Butera et al., 2014). Math instruction in the classroom is more focused on procedural tasks than teaching students to perform critical thinking skills to enhance their mathematical understanding and become more literate in math (Johnson et al., 2017). Students do not achieve the understanding they need to progress in math when it is not connected to literacy skills or conceptual knowledge (Lochmiller, 2016). Effective math instruction occurs when both math teachers and school leaders participate in collaborative conversations in which they use data to determine students'

goals and improve instruction by designing lessons where teachers are coached to improve their mathematical understanding of different instructional approaches (Killion, 2016). Teachers need ongoing professional development to understand math critical thinking strategies (Butera et al., 2014).

Summary and Conclusions

The current study explored the perceptions of elementary school principals' and teachers' perceptions of the supports offered by elementary principals to elementary teachers in the area of mathematical literacy. Chapter 3 describes the research design and rationale and the data analysis plan used to complete this basic qualitative study. By interviewing elementary teachers and elementary principals, themes from the data will emerge that were key to developing an understanding of the supports offered by elementary principals to elementary teachers in the area of mathematical literacy. The following chapter explains the issues of trustworthiness and the ethical procedures for this study.

Chapter 3: Research Method

This basic qualitative study addressed two research questions to explore the perceptions of elementary school principals' and teachers' perceptions of supports offered by elementary principals to elementary teachers in the area of mathematical literacy. In this chapter, I justified and explained the selection of the basic qualitative research study design. I also explain my role as the researcher and describe the methodology used in this study. Data collection and the data analysis plan were described, in addition to application software tools to assist with retrieving the data and answering the research questions. Because of my familiarity with the research site, this chapter detailed issues with trustworthiness and ethical procedures.

Research Design and Rationale

This basic qualitative study involved using the following two research questions to gain the perspectives of elementary school principals and teachers regarding supports offered by elementary principals to teachers in the area of mathematical literacy:

RQ1: What are teachers' perceptions of principal supports offered to teachers of mathematical literacy practices within the math classroom?

RQ2: What are the principals' perceptions of supports offered to teachers of mathematical literacy practices within the math classroom?

A basic qualitative research design was selected for this study. The basic qualitative design does not involve using a specific epistemological tradition but does involve interviews, focus groups, and observations (Patton, 2015). The qualitative research method involves analyzing participants in real-world settings while answering

open-ended questions (Patton, 2015). By conducting semi-structured interviews, the basic qualitative study design was used to identify discrepancies in perspectives between teachers and principals. Interviews allow researchers to contextualize phenomena by accessing perspectives of participants (Merriam & Grenier, 2019). Within this basic qualitative study, interviews allowed participants to express their perspectives and articulate and expound on their experiences of principal supports offered in the area of mathematical literacy. Interview questions within this study involved participants' perspectives and experiences.

The main focus of research questions was to understand how elementary teachers perceive supports offered to them by elementary principals in the area of mathematical literacy.

The research question was not applicable in terms of the grounded theory design. The focus of grounded theory is to develop or build a theory and not explore perspectives (Merriam & Tisdell, 2016). Grounded data involves discovering theories from the participants' data (Creswell & Poth, 2018). This study involved exploring and providing information on perceived principal supports in the area of mathematical literacy and did not have any predictions or hypotheses before data collection. The results of the study were informed using one-on-one semi-structured interviews.

The research questions did not align with narrative research. According to Clandinin (2016), narrative research involves understanding an individual's lived experiences as told by participants. The experiences of stories are collaborative as they are told by the researcher and not participants (Creswell & Poth, 2018).

The case study approach was not selected because the study's goal was to collect data from the perspectives of the elementary principals and elementary teachers. According to Creswell and Poth (2018), a case study is always limited to one case and is a detailed qualitative research approach within a bounded system. The research for this study did not address why or how but addresses what questions involving exploring the extent of principal support given. Yin (2018) described a case study as an empirical inquiry involving exploring a phenomenon within its real-world context. Within a qualitative study, what questions are not relevant to a one-time experience but rather experiences over time (Yin, 2018).

The phenomenological design was considered for this study. However, it was not chosen because the purpose of this study was to explore perceptions and not make sense of participants' experiences and reflections on their experiences. Within a phenomenological research study, research questions are used to answer how and what questions involving participants' lived experiences while bringing focus to the phenomenon (Creswell & Poth, 2018). According to Alase (2017), the most crucial aspect of a phenomenological study is describing and interpreting effects involving participants' experiences of a phenomenon.

In quantitative research, numerical data is used to identify a research problem or explain why something occurs. The mixed methods research design involves using quantitative and qualitative methods to understand a research problem in a single or series of studies (Creswell, 2018). These research methods were not chosen because open-ended interview questions were used that involved perspectives on the study topic.

Role of the Researcher

Within qualitative research, the role of the researcher is as important as the role of participants and collected data (Strauss & Corbin, 2015). I recruited participants within this basic qualitative study, conducted interviews, and transcribed, analyzed, and interpreted the data. I was the primary instrument for collection and analysis of collected data.

I used reflexive journaling throughout the data collection process to help prevent bias that might influence the interview. I identified any biases that I may have had and monitored them to understand how they may influence the collection and interpretation of collected data. As a math instructional leader within the district, it was important to consider and acknowledge my instructional lens.

I used participants within the study with whom I did not have a personal relationship. I did not select any participants for the study from my work location site. Each participant was informed they would take part in a semi-structured interview lasting from 30 to 45 minutes. It is important to yield high-quality data as a good interviewer. During interviews, it was also essential to use my role as a listener and take notes. I observed nonverbal communications through the secured Zoom platform and took notes on participants' body language. Knowledge of the topic assists a researcher in their role and with data collection (Yin, 2016). To remain focused on the topic and answer any questions from study participants, I prepared myself with information from current literature before interviews.

Methodology

This section includes a description of participants' selection logic, instrumentation and collection instruments, procedures for recruitment and participation, data collection, and data analysis. The approach for data collection was to interview participants to understand their perspectives of supports offered by elementary principals to elementary teachers in the area of mathematical literacy.

Participant Selection

The type of sampling that was used for this basic qualitative study was purposeful. My goal for this study was to obtain a substantial representation of elementary principals and teachers. According to Merriam and Tisdell (2015), researchers must choose participants who meet the criteria to gain knowledge and information regarding a topic or phenomenon. Twenty-five elementary principals and 25 elementary teachers were emailed with the hopes of having 8-10 teachers and principals participate in the study. This proposed sample size for the study was intended to be sufficient to provide necessary information to answer the study's research questions. Within qualitative research, there are no specific rules for sample size.

I first secured approval from Walden University Institutional Review Board (IRB) (approval #12-08-20-0750405) to begin data collection. I then obtained approval from the proposed research site school district to conduct my study. Approval was obtained by sending in an application, which consisted of a completed proposal, proposal summary, consent forms, data gathering instruments, and evidence of IRB conditional approval from Walden University. This application was sent to the district's Department of

Research & Evaluation before implementing data retrieval. Written approval was given from this department. A copy of the written approval was emailed to each participant in the study, along with consent forms.

After obtaining IRB (#12-08-20-0750405) approval from Walden University and the research site, potential participants were identified from the research site web site. Twenty-five elementary principals were emailed to participate in the study. All principal participants observed elementary math lessons and had been elementary principals for more than three years. Elementary teachers were allowed to participate in the study based on the criteria that they taught in an elementary school. Elementary teachers in the study were also required to implement mathematical literacy within their math classroom for more than two years.

I attempted to include teachers and principals with different levels of experience to gain different perspectives of supports offered to elementary teachers from elementary principals regarding mathematical literacy.

Invitations sent via email to all potential participants explained details of the study, including its purpose and questions that were asked, as well as a demographic questionnaire (see Appendix B). The demographic questionnaire assisted with using only participants who met criteria of the study. The consent letter asked participants to devote 30 to 45 minutes of their time to answer the questions during non-work hours at a location and time of their convenience. I emailed all participants using my Walden University email address. The invitation contained this address and personal telephone

number for interested participants to contact me within two days of receipt of the consent form.

Instrumentation

The primary instrument of data collection in qualitative research is the researcher (Burkholder et al., 2016). In one on one interviews, the focus of the interview is solely one person. The interviewer asks questions in order to elicit details involving interviewee experiences (Rubin & Rubin, 2012). Within one on one interviews, because the focus is solely on one person, there is no opportunity for another person to interject with their personal experiences, with the exception of the interviewer. Within qualitative research, interviews and focus groups are important because they allow the researcher to identify perspectives and meanings of participants (Ravitch & Carl 2016). Interviews can take more time because they allow for authentic and honest experiences that are most honest compare to focus groups.

Interview questions developed for this study were open-ended, so that followup questions were asked to elaborate and clarify meanings of participants' perspectives. Instrumentation for data collection in this study involved semi-structured and open-ended questions, and interviews with elementary teachers and principals about principal supports offered to elementary teachers in the area of mathematical literacy. To obtain perspectives from elementary principals and teachers, I used two research questions from this study for interviews. In-depth interviews lasted about 30 to 45 minutes per participant via a semi-structured format.

Questions for interviews were selected specifically for this study to gain perspectives of participants. The reason for choosing open-ended questions was to ensure interviews could be as natural as possible and flow like conversations. Follow-up questions were prepared and asked during interviews to clarify and elaborate on perspectives. Interviews were conducted one-on-one with each elementary teacher and principal. To protect participants' identities, each participant was assigned a letter code. Codes assigned to each participant were dependent on the order in which participants were interviewed. For example, the first teacher participant was labeled T1, followed by T2, and so on. The first elementary principal participant was labeled P1, followed by P2, P3, and so on. After each interview, each participant received a transcript of the interview for review within 3 three days of the interview. Participants received transcripts to correct any mistakes or omissions. It was important to be transparent with each participant to make sure recorded information was an accurate and honest representation of their perspectives. After data were collected and participants approved transcripts, data were analyzed and coded using NVivo and in vivo coding.

Procedures for Recruitment, Participation, and Data Collection

The purpose of this study was to explore elementary school principals' and teachers' perceptions of supports offered by principals to teachers in the area of mathematical literacy. The research location of the study was a large urban district in a northeastern state. I was the primary researcher for the study. I recruited principal and teacher participants for this study by gaining email addresses via the district website. After I gained permission from both IRBs, (approval #12-08-20-0750405) formal

invitations via email to potential participants of the study were set to determine who met criteria. Participants were able to contact me via my Walden University email address or personal cell phone number with any additional information they needed regarding their participation in the study.Sample i interview questions were given before the interview and were used to address any thoughts or answer questions before data collection.

Interviews via Zoom were conducted using a semi-structured format. Each participant was allowed to pick the date and time that was convenient for them. Before the interview, each participant was given a letter of consent via email. If the participants agreed to the study, participants were asked to respond to the email with "I consent." Then participants were informed to reply to the email with the contents of the consent form, "I consent." I instructed the participants to keep a copy of the consent form to refer back to any questions or wonderings. I informed participants of my cell phone number to call or email me with any questions or wonderings they may have about participating in the study. Participants were informed they could withdraw from the study at any time, and their data was not used and was destroyed after they rejected the study.

Each participant's interview was audio recorded using the OLYMPUS version VN-541PC as the digital voice recorder. Zoom platform also has a recording setting that was used for the interview. Zoom, the OLYMPUS digital voice recorder, and my annotations were used to ensure the experiences that the participants were expressing were being captured. I allowed 30 to 45 minutes for each interview to ask the interviewee questions and follow-up questions or any additional clarification or responses from the participant. If any of the participants wanted to meet another time via the Zoom

platform, I scheduled the meeting to occur at another date and time. The study's findings were categorized and coded by each theme and subtheme for the elementary teachers and elementary principals. After all interviews were held, each participant was contacted via email to thank them for their participation and assure them their information would be kept confidential and stored away in my home for five years. The participants were informed that after five years, the data would be destroyed. The participants were not given any incentives for their participation in the study.

The data collection methods for the study consisted of a one-on-one Zoom secured recorded interview. Before each interview, each participant read an Informed Consent Form as a requirement to participate in the study. Participants received a copy Informed Consent Form to keep via email.

Open-ended interview questions (see Appendix A) were used for this basic qualitative interview study to gather the perspectives of elementary teachers and elementary principals of the principal supports offered in the area of mathematical literacy. An interview protocol (see Appendix C) was used to help guide the interview as a conversation to have structure and purpose. As the primary researcher for this basic qualitative study, the researcher asked open-ended questions for the participants to answer (Merriam & Tisdell, 2016).

Data Analysis Plan

The purpose of this basic qualitative study was to explore elementary school principals' and teachers' perceptions of the supports' offered by elementary principals offered by elementary teachers in the area of mathematical literacy. Participants were

interviewed via the secure Zoom communications platform on their perceptions of the principal support offered in the area of mathematical literacy. The audio portion of the interview was recorded via Zoom and was recorded using the OLYMPUS version VN-541PC digital recorder. After the data collection process was completed transcribing the data from the in-depth interview occurred. Zoom has an audio transcription that was used to transcribe the recorded Zoom interview. To transcribe the audio on the OLYMPUS digital voice recorder, the USB cord that came with the device was used to transfer the audio to a Late 2011 13-inch MacBook Pro. NVivo was used to transcribe the data from the OLYMPUS digital voice recorder. I utilized NVivo transcription and Zoom to provide verbatim transcripts of all of the in-depth interviews. The transcribed data was placed into Microsoft Word and emailed to participants for review. I utilized my notes and audio recording to compare the results of the transcript. Member checking was also used to check the results of the transcripts by providing a copy to each participant via email for their review within three days of the interview. After the participants were provided with the transcripts via email, I asked the participants to respond to the email in agreement with their transcribed data or any questions. If participants agreed with the transcription provided, they were asked to respond to the email with "no changes necessary." Member checking helps to improve the credibility and validity of the research (Saldana, 2016).

Transcription of the words in a qualitative research study is essential to data collection because this is where the data is found (Miles, Huberman, & Saldana, 2014). The transcripts helped identify themes exploring the perspectives of the principal

supports in the area of mathematical literacy. NVivo was utilized to assist with the organization of the data. Before using NVivo, I analyzed the transcriptions to identify similarities in the perspectives and ideas. I identified common themes and terms from the words and phrases of the participants. After analyzing and coding the data, I used NVivo to manage the data and look for themes and subthemes from analyzing the text. The themes identified from the data analysis were applied to answering the research questions.

I also utilized in vivo coding to code the data based on the language and experiences used by the participants in the research (Saldana, 2016). The transcripts were reviewed and analyzed to identify words and phrases that were similar between each participant. I looked for similarities between words and phrases with each question asked. After going through each question, I completed the second round of coding, where I looked for themes and categories. These themes and categories that were identified were written out via an outline on Microsoft Word. I compared the analysis from NVivo and the in vivo coding analysis done by me to validate the results.

Trustworthiness

To ensure the findings are worth paying attention to, it is important to make sure the proof of reliability and validity in qualitative research is required (Amankwaa, 2016). To ensure quality in a qualitative study, the research must verify trustworthiness by indicating the credibility, transferability, dependability, and conformability of the study. Trustworthiness within qualitative research is important because it builds trust with the participant and makes sure that the information obtained is kept confidential, and respects

the participant's privacy (Ravitch & Carl, 2016). Different perspectives were triangulated by interviewing teachers and principals about their perceptions of the principal supports offered in the area of mathematical literacy.

Credibility

To achieve credibility, Ravitch and Clark (2016) suggest using strategies that are common in qualitative research, such as triangulation, debriefing, and engagement. Credibility relies on close collaboration with participants through the research process (Creswell & Miller, 2000). I utilized member checking within the basic qualitative study, which allowed the study participants to make any necessary changes or corrections if needed (Patton, 2015). According to Yin (2016), credibility is the assurance that a researcher has accurately collected and interpreted data so that the study results reflect an accurate depiction of the world.

Transferability

Transferability allows the findings to have applicability in other contexts (Amankwaa, 2016). A strategy that can help to facilitate transferability within research is thick description (Amankwaa, 2016). Detailed, vivid descriptions of the experiences and perceptions from the lens of the participants are thick descriptions, and thin descriptions are not detailed but a simple recall of factual information (Creswell & Miller, 2000). By describing the phenomenon within the research, the researcher can evaluate how the conclusions drawn can be transferable to other times, settings, situations, and people (Amankwaa, 2016). This basic qualitative study addressed transferability by coding and transcribing the results of the study. The data provided a thick description of data to apply

transferability to other settings. Transferability also combines other studies and theories and compares them with another study (Saldana, 2016).

Dependability

Dependability refers to the consistency of the study's results during the data collection process (Patton, 2015). Participants of the study were provided with their transcript of the interview to allow for further elaboration or edits of the transcription. By conducting the same process and procedures of the transcribed interviews during data collection, I achieved dependability. If there were changes within the research process and data collection, the researcher must justify the changes and how the change affects the study (Patton, 2015).

Confirmability

According to Ravitch (2016), qualitative researchers need to have data confirmed. Merriam and Tisdell (2016) compare confirmability to the concept of objectivity. Confirmability makes sure the study is free of bias and prejudice (Patton, 2015). Member checking within the study was utilized to achieve confirmability and allow participants to evaluate their interview transcripts and provide feedback or edits. I recorded notes during the interview process and confirmed the notes against the recordings. I maintained an audit trail of my notes, transcriptions, thoughts, and reflections to ensure confirmability.

Ethical Procedures

Before collecting any data, I submitted my research study to Walden University's Institutional Review Board (IRB) for Ethical Standards in Research. Submitting my research to IRB was done to ensure the study follows ethical standards, including federal

regulations. According to Creswell and Poth (2018), IRB's are guided by three policies: respect for persons, concern for welfare, and justice. Approval of my data was gained from IRB before collecting data. I obtained conditional IRB approval from Walden University then gained IRB approval from the research study site. IRB approval from the research study site could not be processed or approved until I gained conditional approval from Walden University's IRB. After permission was granted from the research site, then approval from Walden's IRB was granted.

Yin (2016) asserted that research integrity had been gained when the researcher and their findings can be trusted and they are an honest and valid interpretation of the research study. Ethical research must also be maintained to protect participating human subjects. Research integrity was maintained throughout my study by making sure I was transparent, honest, and truthful during the research process. Planning and preparation assisted with maintaining accuracy during the research process.

The policy on respect for persons was addressed by assigning a pseudonym for use in the study's results. Pseudonyms were given instead of the participant's actual name to ensure privacy. Informed consent was given to the participants who agreed to participate to ensure data protection and privacy. The informed consent was reviewed with the participants. The participants were allowed to ask any questions during the Informed Consent Form review. The consent form informed the participants of their choice to opt out of the study without any penalty.

Moreover, participants were provided with evidence that I did not subject them to any psychological risks. Participants were made aware that I was a neutral party, and I

did not interview them on behalf of the research site. To gain their trust, it was important for the participants to feel comfortable answering questions openly and honestly without hesitation. Their identity was revealed within the study or to any other member within the research site. Although the interview was conducted via the secured Zoom platform, participants were allowed to choose the location and time of the interview to create a more relaxing atmosphere. The policy of justice is addressed by making sure all participants were treated equally and respectfully throughout the entire research process.

The interview process allows participants to ask questions at any time. If participants want to opt out of the study, they were informed of their right to do so. Any information gained from participants who opted out would be destroyed and would not be considered for the study. More participants were recruited to replace participants who opted out.

Participants were assured that the data collection obtained during the research process would be protected and their confidentially secured. The information that was retrieved, precisely the personal information from the participants, was not going to be shared. The information retrieved from the study was stored on a laptop using password-protected software. I am the only person who had access to the information and the laptop, and I am the sole user of the laptop. I am also the only person who had access to any transcribed data and coding software stored on the laptop. The transcripts software used for this study was NVivo, which provided detailed verbatim transcripts of the interviews. The study participants received information that the identifying information obtained from them during the study remained secure and was only visible by me. The

identifying information retrieved during data collection will remain on password-protected software on my computer and in a secure location in my home for five years. After five years, all the data and all the written information retrieved during data collection will be destroyed.

Summary

This chapter detailed the research method that was used for the study. This chapter included several sections. The first section discussed the research design and rationale. This section also detailed the reason for selecting a basic qualitative research design as the method for the design method for this study. This study was a basic qualitative research study to explore elementary school principals' and teachers' perceptions of the supports' offered by elementary principals to elementary teachers in the area of mathematical literacy. The next section of the chapter discusses the role of the researcher, methodology, rationale for participation selection, and instrumentation. Then, a discussion on how participants were recruited for the study and the procedures used for data collection, and the detailed overviews of the data analysis. The chapter concludes with the ethical issues that were present and issues of trustworthiness. Chapter four discusses the findings of the research study from the collected data.

Chapter 4: Results

The purpose of this basic qualitative study was to explore elementary school principals' and teachers' perceptions of supports offered by elementary principals to teachers in the area of mathematical literacy. Specifically, I aimed to address the gap in research regarding principal supports offered to teachers in the area of mathematical literacy. A basic qualitative design was used for this study to explore and describe a phenomenon using interviews by analyzing participants in a real-world setting while answering open-ended questions. In contextual conditions, qualitative researchers address the how and why of a phenomenon (Yazan, 2015). This study will add information to previous research regarding perceptions of elementary teachers and principals about perceived supports offered by elementary principals to teachers in the area of mathematical literacy. Two research questions guided this basic qualitative design:

RQ1: What are teachers' perceptions of principal supports offered to teachers of mathematical literacy practices within the math classroom?

RQ2: What are principals' perceptions of supports offered to teachers of mathematical literacy practices within the math classroom?

Data for this basic qualitative design were collected via semi-structured interviews. Interviews were conducted one on one with 17 participants from elementary schools. In this chapter, I present data findings, a description of the setting, data collection, and participants demographics. A detailed description of the strategies used for collecting, analyzing, and presenting the data is included in this chapter. The chapter concludes with the study's results and evidence of trustworthiness.

Setting

The setting for this basic qualitative study was a northeastern K-12 comprehensive school district in the United States. At the time of data collection for the study, there was a global pandemic; this pandemic limited social gatherings. Interviews were in-depth, which provided me with detailed information involving experiences and stories from participants' perspectives. The COVID-19 pandemic made it difficult for interviews to be conducted in person to maintain safety for myself and study participants. Schools across the nations were closed at the end of the 2019-2020 school year. In the next year, many schools opened their doors for distance learning with technology use for many teachers and students. Because of circumstances of school closures and safety mandates due to the COVID-9 pandemic, the number of volunteers willing to participate in the study was impacted. Instead of in-person interviews, interviews took place at a convenient place for participants via Zoom.

All study participants were employed at a school district in a northeastern state of the United States. The school district has 208 schools and centers, including over 100 elementary schools, 130,000 students, and 20,000 employees. Student demographics were 36% Hispanic, 0.3% American Indian/Alaska Native, 3% Asian, 55% Black, 0.2% other/Pacific Islander, 4% White, and 1% two or more races. Participants in this study were purposefully selected from elementary schools.

Seventeen participants, including eight teachers and nine principals volunteered to participate in this study. To maintain confidentiality, each participant was assigned a code. The interviews were coded in the order they were completed. Teachers' educational

experience ranged from seven to 34 years. Principals' experience ranged from 3 to 16 years. Tables 1 and 2 include participant demographics.

Table 1

Participants Demographic Information – Principals

Participants	Gender	Years as a Principal	Years observed math instruction	Attended/Offered professional development on mathematical literacy
P1	Female	9	17	Attended and Offered
P2	Female	3	7	Attended and Offered
P3	Female	3	20	Attended and Offered
P4	Female	3	8	Attended and Offered
P5	Female	5	12	Attended and Offered
P6	Female	5	7	Attended and Offered
P7	Female	16	12	Attended and Offered
P8	Female	4	7	Attended and Offered
P9	Male	4	5	Attended and Offered

Table 2

Participants Demographic Information – Teachers

Participants	Gender	Years as a teacher	Years taught math	Attended/Offered professional development on mathematical literacy
T1	Female	16	12	Attended
T2	Female	7	7	Attended
T3	Male	14	7	Attended
T4	Female	34	34	Attended and Offered
T5	Female	18	18	Attended
T6	Female	22	12	Attended and Offered
T7	M	16	5	Attended
T8	Female	16	16	Attended and Offered

Data Collection

I began the data collection process after approval from the Walden University IRB (approval #12-08-20-0750405). I also received approval from the research district's site to begin data collection by recruiting and interviewing teachers and principals within the district. First, I emailed 25 principals with the hopes of gaining eight to 10 principal participants to participate in the study. I obtained the email addresses of 25 principals from the district's public website. I emailed all 25 principal potential participants a

consent form, the approval letter from the research site, and a principal permission form from the research site. The principal permission form authorized me to ask principals for their signature to recruit teachers within their school. From the 25 principal participants emailed, only three principals responded right away to participate in the study, and three provided signatures to recruit teachers within their schools. After obtaining the principal permission form from seven principals, I looked at district websites to find email addresses of all teachers within their schools. I emailed all teachers within those seven schools the consent form and research site approval form. If participants agreed to participate in the study, they replied to my email with "I consent." I received a response from 10 teachers. Of the 10 teachers who replied, only nine met the criteria for the study. One participant decided not to participate before interviews began.

After obtaining emails from eight teachers and three principals, I asked participants to pick a time during non-work hours to conduct the study. To maintain confidentiality, I interviewed all participants virtually within my home in my office in a locked room. Interviews with three principals took place over seven days. Scheduling with principals and teachers was a slight challenge because finding time after work hours for participants was challenging. Principals were transitioning from working at home to working at schools. During data collection, principals moved from working from home two days a week to four days a week to prepare staff and students for hybrid instruction two and then five days a week. During the time of recruitment, the research site was moving from complete virtual instruction to hybrid instruction. This transition created anxiety for teachers and principals, which made scheduling difficult. Because my initial

goal was to obtain eight to 10 principal participants, I resent the email with the consent form and district approval letter to the 23 principals who did not respond. This email differed from the initial email because I informed principal participants that their participation would allow me to complete my study. I received responses from six additional principals, making a total of nine potential principal participants. Some interviews had to be rescheduled because of work-related conflicts even after work hours. Interviews with eight teachers and six additional principals took place over two months.

The length of time of the 17 interviews ranged from 30 to 60 minutes. I made every attempt to keep interviews shorter than 45 minutes; however, it became clear that some participants needed more time to describe their experiences and perceptions of principal supports offered to teachers of mathematical literacy practices in the math classroom. Interview questions were not strictly scripted and were semi-structured.

Before each interview, participants were reminded of the purpose of the study. Participants were also reminded of confidentiality during, before, and after each interview. Participants were asked not to use any names. If names were used during interviews, participants were informed that the name would not be included in the interview transcript. The consent form was reviewed, and any questions were answered before the start of each interview. Interviews began with thanking participants for taking the time to participate in the study. I then asked participants for their demographic data to ensure they met criteria to participate. Principal participants observed elementary math lessons and had been an elementary principal for more than three years. Elementary teachers were allowed to participate in the study based on the criteria that they taught in

an elementary school. Elementary teachers in the study were also required to implement mathmatical literacy within their math classroom for more than two years.

I also used field notes to jot down any nonverbal communications and body language during interviews. These field notes helped me engage in deep reflection after the interview process to ensure my biases and feelings did not impact the data. Field notes also helped me stay focused on research questions in order to produce rich descriptions of data. This was also used to check for any potential researcher biases.

Participants were interviewed via Zoom. Audio portions of interviews were recorded via Zoom and using an Olympus VN-541PC digital recorder. I used audio transcriptions from Zoom and a digital recorder to transcribe each interview verbatim within one to three days of each interview. Transcribing interviews by hand allowed me to begin pre-analyzing data and address additional notes after interviews were completed. Transcription notes were helpful during the coding process because I referred back to these notes while coding. Member checking was also used after transcriptions were complete. Participants were provided with a copy of transcripts within one to three days of each interview. Participants were asked to review transcripts with any edits or additions that needed to be made and notify me of any questions. If there were no changes that needed to be made to the transcripts, participants were asked to respond to the email with “no changes necessary.” All participants responded this way. Transcriptions will be kept on my password-protected computer for five years as required by Walden’s IRB. After five years, data will be destroyed by shredding papers and removing data from my computer.

Data Analysis

After approval to begin data collection, I immediately obtained principals' email addresses off the research site's website. I emailed 25 principals a consent form, district approval letter, and principal permission letter. When only three participants responded with "I consent," I immediately scheduled interviews. To reach data saturation, it was important to gain more participants with the study. I emailed 23 principals again, informing them of my hopes to obtain additional participants to complete my data collection. I received six responses after the second email was sent. I also emailed teachers at three different schools and received eight responses to participate in the study. After the interview process, I began my data analysis process by transcribing interviews. According to Yin (2016), transcribing interviews serves as the initial step of the analysis process. As interviews were transcribed, I completed a preliminary analysis by reviewing and interpreting participants' experiences. I used audio recording and the digital recorder devices to transcribe data via a Microsoft Word document. Each participant was emailed a copy of their transcription in a PDF format within one to three days of each interview to corroborate their responses during interviews as part of the member-checking process. All participants responded that no changes needed to be made to transcripts within 24 to 48 hours of transcriptions being sent.

After data collection, I printed out each transcript. I began coding by following interviews. I began to use printed transcripts to highlight verbatim words and phrases via in vivo coding. Highlighted words and phrases that emerged from the analysis of the transcripts were used to answer research questions. After applying in vivo coding to

printed transcripts, I used NVivo to identify emerging themes by highlighting words and phrases from participant interviews (see Table 3).

Table 3

First Cycle Coding: Codes Determined Through In Vivo Coding

Interview Questions	Codes
1	Teacher leader. Approachable. Builds relationships with staff. Caring. Compassionate. Open Door Policy. Communicates and collaborates with teachers. Comes up with solutions. Offers and differentiates feedback based on the needs of the teacher. Providing resources. Providing the opportunity to the teacher to be creative with the curriculum. Creates a vision for the school. Models classroom best practices. Transparent. Knowledge of the curriculum. Support the teacher in professional growth. Uses data.
2	Not afraid to rote teach. Transform the learning that they understand. Break down the system of math so students can understand. Patient with students. Aware of the struggles with math. Process math and break it down so that students can understand. Plans for daily instructions. Attends and participates in professional development and conferences. Collaborative. Incorporate manipulative, and technology resources. Use data to make adjustments to their teaching. Engage students. Vocabulary. Hands-on experiences. Have multiple ways to explain to students. Guides students but does not tell students.
3	Need to be aware of the curriculum and what goes behind the development of the curriculum. Principal pipeline for principals. Network where principals work together. Instructional director who is supporting you is also evaluating you. Math coach. How to review the data. How to use the testing platform. Learning the concept and curriculum. Being a part of collaborative planning. Being Hands-on. Monitor the data. Collaborative Conversations. Professional Developments. Knowledge of the content. Awareness of where each teacher is. Providing resources. Submit lesson plans. Finding someone in the building to help you. Knowing the teachers. Understanding teachers' personal teaching style. Giving constructive criticism that will help growth. Ask what your needs are. Observe you and see what you know. Provide Feedback. Support other teachers

4	Knowing a deeper understanding of not only how math works but why it works. See the progression of those skills and how it affects different grade levels as they continue. Just deeply knowing that math. Use number concepts or geometry, numeracy. Connect those relationships or numbers. Real-life problem. Understanding how it works. Understanding of mathematical terms. See a word problem and understand the vocabulary and the terminology in it. Having the foundational skills.
5	Tying in specific concepts that focus on the literacy. Moving from decoding to procedural to application. Key Vocabulary terms. Modeling integration from other content areas. Opportunities for students to take notes. Showing students how to find resources. Taking notes on what students are doing. Providing feedback to the students. Finding time to conference with students. Coaching them through the math. Five E Lesson plan. Students have the opportunities to solve problems in a way that makes sense to them. Allows you to see misconceptions. Allows you to see that they are thinking. Students talking math. Students writing math. Students share math. Non-negotiable. Virtual manipulatives. Real Life scenarios. SOLVE method. Engagement. Questioning. Multiple ways to solve the problems. Students using manipulatives. Students facilitating the discussion around math. Students understand what the problem is asking them to do. Provide Models. Assessing students. Small group instruction. Three Read Protocol
6	From the curriculum. Not enough training. Three Read Protocol. Math ILT. School-wide initiative. SOLVE Method. Vocabulary. Questioning.Manipulatives. Modeling Lesson. Peer Observations. Collaborative Planning. No Trainings. Cannot remember. Too many changes. Not enough time. Project-based Learning. Collaboration with teams. Collaborative planning. After school meetings at colleagues' homes.
7	Not observed in math. Math ILT. Do not remember feedback. Cookie-cutter. Checklist. Given immediately. On things that did not happen. Not Math related. About lesson plan. Student's participation. There was a form that was given to me. Not formally. Learning Walks. We did learning walks on mathematical literacy strategies. Observed in Reading. Observed informally by Math ILT. We split up the PDs. I do not

	observe Math. AP observes math. Vocabulary. Questioning strategies. Discussion techniques are a weakness. Math Department comes in.
8	Effective teachers receive supports. Teachers who do not need support don't receive it. The Principal does not have the same level as teachers. Good amount of support. Always room for more. Provides the resources that are necessary. Tells us about the trainings offered. No. Closed mouths do not get fed. I do not ask for support. Cookie-cutter. Reaches out for support. Peer Observations. Math ILT. Provides time. Support from colleagues. Provides time for communicating with colleagues. Model lessons. Difficult virtually. Busy with the work of being an administrator. Too many changes. Thirty minutes at the beginning of the year. From the Math Department. Each Department gets 30 minutes. Math ILT shares the information. Weekly updates. Try to make it unified. Unlock the Prompt. Math ILT works with students.
9	Support from the curriculum writers. Math needs their own day. Focus in on curriculum. Protected time. More defined rubric. Consistency from everyone. Math ILT in every building 2. Principal to put more emphasis on math. Giving teachers time to discuss freely math curriculum. Having other teachers give insight. PD on how to create resources for differentiation

Table 3 and hand-coding provided a preliminary analysis of the findings of the research questions. However, NVivo software was used to organize the themes developed from the most frequent corresponding codes to develop themes. Themes emerged from merging codes, discarding codes, and making connections between codes (Ravitch & Carl, 2016). Table 4 provides the themes that emerged from in vivo coding and the corresponding codes with each theme. The themes identified aligned with the research questions of the study.

Table 4

Major Themes

Theme	Corresponding Codes
Distributed Leadership	Teacher Leader. Providing the opportunity to the teacher to be creative with the curriculum. Math Coach. Finding Someone in the building to help you. Peer Coaching
Professional Development	Math Department. Curriculum training. Three Read Protocol. SOLVE strategy. Math Instructional Lead Teacher. Mentor. School-based professional development.
Makes time for collaborative efforts	Collaborative Planning. Math Instructional Lead Teacher. Creative Freedom. Ability to plan. Planning Support. Observations. Peer-to-peer observations. Learning from colleagues.
Leadership Practices	Open. Flexible. Open Communication. Approachable. Transparent. Models classroom best practices. Support the teachers in professional growth. Uses data.

Results

This basic qualitative study explored two research questions understand their experiences and perceptions of the supports' offered by elementary principals to elementary teachers in the area of mathematical literacy.

RQ1: What are teachers' perceptions of principal supports offered to teachers of mathematical literacy practices within the math classroom?

RQ2: What are principals' perceptions of supports offered to teachers of mathematical literacy practices within the math classroom?

Seventeen participants, nine principals, and eight teachers were interviewed through individual semi-structured interviews from a district in a northeastern state. Each participant was given a pseudonym for the interview transcripts and the results. The results and findings of this study were based on the semi-structured interviews of the seventeen participants. Based on the interview responses from the elementary principals and elementary teachers, the following four themes emerged: professional development, distributed leadership, make time for collaborative efforts, and leadership practices.

Theme 1: Professional Development

Math Department Support

All 17 participants unanimously agreed in terms of the support were given by the district's math department. The math department provided supports that were necessary for the implementation of mathematical literacy strategies. T2 stated, "the math department is doing a really good job this year, especially during a pandemic. They have provided Google Slides to be used every day that incorporates some of the mathematical literacy strategies such as the three read protocol." The three read protocol, and the SOLVE method are strategies that have been taught from professional development with the math department. T3 stated, "I attend these professional development sessions about once a month. The sessions are split up by each grade, so I attend for my grade level. I remember particularly learning about the three read protocol in a session and how to implement this strategy within the classroom. The three read protocol was modeled for us. This professional development session was particularly memorable for me because we were allowed to collaborate with other colleagues on our grade level about how they have

implemented the strategy within their classroom. I remember a teacher telling me how she used sentence starters for her ESOL students to assist students while teaching." Both participants described how the modeling aspect of the math department trainings of the mathematical literacy strategy was helpful with implementing the strategy right away in the classroom. By engaging in conversations with other teachers around the district about the mathematical literacy strategies learned in professional development, teachers were more confident about implementing them into the classroom. P7 stated, "when the math department was able to model the mathematical literacy strategy, I was able to clear up my misunderstanding of what I was doing wrong with the strategy. I took notes on the questions asked of us when the strategy was modeled, and I used the same questions the next time in my classroom. The students were able to provide responses that assisted with different solutions for the problem, which was my goal."

Moreover, principal participants were aware of the professional development opportunities provided by the math department. One principal participant, P3, points out, "the math department is doing better than some other content areas regarding professional development opportunities. I don't know what the professional development sessions are particularly on, but I know they are offered. The math department provides weekly updates to help us keep teachers informed of information and changes. " Principal participants recognized the importance of allowing teachers to participate in the county professional development offerings. However, P4 stated it "becomes hard to use some of the strategies that are taught for a specific topic like mathematical literacy because

principals aren't offered any professional development sessions during the year for topics such as mathematical literacy."

Five principals expressed how as principals they receive support from the math department. P3 stated, "I know when I need the math department to come out, they will." P9 stated how it might be beneficial if the math department provided PowerPoint slides of effective mathematical literacy strategies that could be used within the building, " it would be great versus me having to create an entire training on something that could be a system-wide initiative." Principal participants stated how the professional development they receive from the math department is not enough to provide information to the teachers to support implementing any strategy within the classroom. Principal participants expressed how the training that was provided by the math department was primarily at the beginning of the year. Principals would learn about the curriculum and any new strategies to implement within the school year; however, P1 mentioned the professional development provided by the math department as a "sit and get" professional development. The training was about a half-hour long with manipulatives and with videos on how to read the curriculum." However, P2 expressed how the training did not prepare principals on how to implement mathematical strategies for teachers because the training was "too short and built-in with all the other content areas." Four principals expressed how the math professional development was not a priority because of all the mandates and changes that had to be addressed in meetings with principals.

School-Based Professional Development

Five participants expressed how the professional developments came from leaders within the school. During the professional development sessions offered to teachers after school hours, teachers received a stipend for their attendance. T4, stated “during our collaborative planning sessions last year, we talked about how we were having difficulties on questioning strategies for our ELL population. Our principal was in this particular collaborative planning session and discussed how questioning was often the feedback focused on during observations, and how questioning was a struggle for many teachers within the school. We got together with another school to learn how to use the four types of questions with our students. I don’t remember anything from the professional development. But the one thing I did take away was how to use the question starters within the curriculum during lesson planning. After that professional development, we did not discuss the four types of questioning strategies that we learned again, so what we learned was not beneficial.” T3 stated how the professional development strategy that was offered to the teachers was after school and was not long enough, “we spent most of our time with students in the cafeteria because of a late bus. Because we had late hours in our school, many teachers did not attend. We did, however, learn about the three read protocol, and we developed a poster that could be used within the classroom. The poster is now hanging up in my classroom, I use the poster when we go over the three read process with my students.”

Principal participants understood the importance of school-based professional development. However, two principal participants discussed how they provided

professional development opportunities for their teachers after school last year. P3 stated, "Because of our math SMART goal, we realized that students were having difficulty with reasoning, explaining, and justifying their answer. I talked with our math instructional lead teacher to provide after-school training on the three read protocol from the curriculum. However, that was last year. This year we just couldn't provide that type of training because of the other needs of the staff because we now have to incorporate technology and engaging students virtually through distance learning in math." P5 also provided after-school professional development for math, " I know one of the training was specific to writing in math."

Instructional Coaching

Three principals expressed how their math Instructional Lead Teachers (ILT) provided them with the information they would use to support teachers. P6 stated that their background in reading, they worked closely with the math Instructional Lead Teachers to coach them on math best practices. P3 stated, "When I am not sure of something during an observation that was used during math, I go to our ILT. Because of their knowledge and training, I have been able to use them to support our teachers." The math ILT was used as an instructional resource to coach teachers on their knowledge of math best practices during collaborative planning and mentoring one-on-one sessions.

T2 recalled it was her math instructional lead teacher who modeled using the three read protocol in her classroom. The math instructional lead teacher has been able to sit down with teachers and provide them with specific strategies for using the strategies for implementation with their students. T5 stated, "I know the math ILT is there to

support me when I need help. They know I struggle with students and their explanations during math. When the math ILT comes by my room, they will co-teach with me. After school, they will come to my room, and we will discuss how the lesson went and what I could do in the future." T1 expressed how their experience with the math ILT has shaped them as a teacher because of the constant modeling and training provided by the ILT as a new teacher. Three teachers expressed that they do not receive support from the ILT as much as they did when they were a new teacher because they are more seasoned teachers. Two of the three teachers expressed that they do not receive support from the ILT because they do not ask for support.

Theme 2: Distributed Leadership

Math ILT

Teachers' perception of supports provided by the principal for mathematical literacy strategies were from the math ILT. T7 stated, " I receive a lot of support from the ILT or the math person. And mostly, that for me is very helpful. "Because the supports that we received is in a small group with other teachers or by ourselves. Through collaboration, we were able to look at the data and then look at the strategies that can be applied to the data." Teachers have expressed that it is the math person who does everything to provide strategies for mathematical literacy. According to T7 and T4, the supports the principal has provided is "cookie-cutter" and seems to be from a sort of checklist.

In contrast, the support from the math instructional lead teacher is based on the conversations that are held individually with teachers and during collaborative planning

meetings. Teachers use the math ILT as a resource when students struggle with concepts and mathematical literacy strategies discussed in the curriculum. T2 expressed how they use the math ILT " as a really great resource. When I did not understand the SOLVE method, I asked the ILT for help on the strategy. They came into my classroom and showed me how to use the strategy in the classroom. The ILT can give us many of strategies that we can use in the classroom because they are not too far from being out of the math classroom."

Moreover, the math ILT has a math background in math that has allowed them to provide teachers with different strategies for their math classroom. However, principals expressed how every school does not have a math ILT. P4 and P5 shared how they had realigned money within their budget to have a math ILT within the building because they saw the need for a math leader who had math knowledge within the building. P3 shared, "with the math ILT, we were able to think about school-wide activities that could benefit the school in terms of mathematical literacy. As a school, we have adopted the use of the three read protocol into our math instruction." P7 shared how this year, they were also provided with a math literacy coach from the math office that directly supports the teacher's individual needs.

Principals have relied on the support from the math ILT to provide the needed information to teachers. For eight out of the nine principals, the math ILT facilitated the conversations during collaborative planning. P8 expressed how most of the conversations during collaborative planning were about doing the math and sharing student work on weak strategies. " A lot of our student work that was shared this year was on students

explaining their answers," stated P8. P8 used the math ILT to provide a rubric to teachers to assist students with the expectations as a school when explaining their answers.

Teacher Leader

Building the capacity of teachers within the building increases the morale and excitement within teachers to implement strategies within the classroom. T6 stated how the principal provided them with feedback during our observation on how I engaged students during discussions. "Because of our conversation, the principal wanted me to observe two teacher classrooms. After observing their classroom, they then observed my classroom for techniques on engaging students in a rigorous conversation about math. I did not want to do it, but my principal pushed me to do it." T4 stated how she was asked to be the grade level team lead within the building after several conversations with the principal around math. T4 also expressed, "most of the time, I was observed within reading, so I did not think my principal knew about my math ability. However, the principal shared it was because of the conversations that I was having with my colleagues during collaborative planning that motivated her to push me to be a math leader within the building." The principal understood the importance when other teachers could grow the capacity of teachers within the school through collaborative conversations. Four teachers stated how they have taken on a leadership role within their grade level because of the support they have received from the math department or the ILT that has allowed them to support others.

Theme 3: Making Time for Collaborative Efforts

Collaborative Planning

allows educators to participate in implementing and evaluating lessons through collaborative conversations with their colleagues. During collaborative planning sessions, educators can meet with resource teachers and content area specialists to receive feedback, suggestions, and guidance on their lessons and practices. Eight of the seventeen participants discussed how collaborative planning sessions with their colleagues strengthened their practices within the classroom. Through the collaborative planning sessions, they were motivated by their colleague's ideas on math practices within the classroom. T2, stated " I remember when I first started teaching math, I struggled. It was hard for me to learn all of the models and diagrams that the Common Core Standards were based on. Collaborative planning is where I was able to learn math from one of the older colleagues. I remember feeling safe in this space because I was not the only one on my grade level who struggled with teaching the concepts in math."

Teacher participants discussed how often collaborative planning sessions were not beneficial because of the checklist of agenda items the administrators or leaders of the school required during collaborative planning. T5, stated "we have focus sessions during collaborative planning. The focus session that I like the most is the student work sessions. Although sometimes it is not as "beneficial because teachers don't come prepared with the student work to the session. However, I started bringing student work of students who struggled with the same concepts. My co-teacher also had a student who struggled as well. Our administration team allowed us to group our students by ability across classes

so that we would not have any outliers within your classroom. I don't remember doing anything around math literacy in collaborative planning. However, sessions such as this helped with the overall discussion in my classroom when students who were similar in ability were grouped."

Four of the eight teachers expressed through collaborative planning is where they were given the time to work with their colleague and the Instructional Lead Teacher. T6 further explained the benefits of working with teachers and being able to be afforded the time to collaborate. The time for collaborative planning is set in the master schedule for teachers and is usually not canceled. Teachers expressed how collaborative planning has helped with the implementation of strategies because "attending the math coaching sessions and trainings are helpful, but once you leave them you're kind of on your own," T6 explained, together as grade-level team teachers can look at the student misconceptions and dig deep through the concepts together to come up with strategies to discuss how to clear up the misconceptions and gaps for students. T5 shared how they used the math literacy mat to discuss math literacy strategies because word problems were always a struggle for students. Together they would use the math literacy mat, which encompassed many mathematical literacy strategies to focus on with their students. "One of my colleagues loved the mat, so she always used strategies from the mat that that was helpful, and then she would show us after she implemented the strategy."

Finding time for colleagues to collaborate is not hard when time is given weekly for teachers to collaborate. However, principals stated that finding extra time for colleagues to collaborate during the pandemic has been challenging because obtaining

substitutes has been challenging. Teachers need more time to collaborate. P5 expressed how before the pandemic, they could provide a day each quarter for grade-level teams to get together and plan out the rest of the year. This day they were given "creative freedom" to just plan. These days were beneficial because teachers could really look at the curriculum, go through and plan out what to cover, and pull out resources beneficial for a week. Five principals mentioned time as an area of support. They would love to give more time to teachers to go through the resources and get to know the curriculum and standards they are teaching. P4 mentioned, "I noticed some teachers struggle with math and the strategies that are within the standards." The curriculum has many resources that teachers can use to help develop their practices with math skills and strategies. However, there is no time to collaborate as a team to learn all those strategies.

Observations

Peer-to-peer observations is a strategy that was used with three teachers from the study. During peer observations, the teacher observes another colleague's class with a focus in mind. Two teachers stated they observed the teachers with a focus on engaging students and discussion techniques for math. Before the observation, the teacher was allowed to communicate with their colleague about the lesson. After the observation, there was communication with their colleague about what they saw in the lesson. Both teachers expressed the principal set up this peer-to-peer observation. The principal did not observe the classroom with the teachers, but the principal or math Instructional Lead Teacher did communicate with the teacher about their takeaways from the lesson. T4 shared, "I observed another colleague's class at another school because of our principal.

After the observation, I communicated a lot with the teachers in our school about planning and the different strategies and resources they used within their classroom."

Learning walks have also allowed teachers to observe other teachers' classes. Teachers debrief as a school community about what has been seen during the learning walks and the glows and areas of math concerns of the school community. After our first learning walk last year, our principal put in place for us to focus on writing as a school community in all subject areas. " I was able to see how there was a need for this focus by participating in the walk," shared T5.

Theme 4: Leadership Practices

The leadership style of the principal has motivated teachers to take risks and implement strategies within the classroom. Because of the work of the principal, the principal does not provide feedback specific to mathematical literacy. T8, stated "I don't think my principal is a math person or even knows what mathematical literacy is. However, when we talked about it during collaborative planning, the principal supported our efforts to want to have one specific strategy within the school."

When providing feedback to teachers, the principal provides feedback to teachers from a checklist or allows the teacher to participate in the feedback process. T4 stated, "during the post-observation conference, the principal presents evidence observed during the lesson. After they present the evidence, I communicate the rating I believe I should have. If my rating is different from the principals, we communicate about our differences." The principal is approachable and has an open-door policy that allows teachers to share any struggles that are going on in the classroom. Five teachers

expressed that the principal uses data to inform their decisions and shares the "why" behind their decisions if it affects teachers' instruction. The leadership practices displayed by the principal as being open, a listener, approachable showed the teachers the principals supported the teachers in their professional growth. T7 shared the principal always made it clear what the schools' vision was and how teachers could support the school's vision by becoming knowledgeable of their craft." All of the teachers expressed that the principal supported the teachers by providing them with resources for instruction.

Evidence of Trustworthiness

Ensuring the credibility and trustworthiness of the researcher is important to the study's research (Merriam & Tisdell, 2016; Patton, 2015). To ensure the quality and trustworthiness of the data the credibility, transferability, dependability, and conformability were established. According to Ravitch and Carl (2016), trustworthiness in a study depends on how the researcher accurately depicted the participant's experiences of the phenomenon through their responses.

According to Yin (2016), credibility is the proper interpretation of the data and the accuracy of the conclusion. To ensure credibility through this study, I provided the participants with a copy of the transcript. Through member checking, the participants were able to review the transcripts of their responses to make any necessary changes or corrections if needed. The participants of the study indicated that there were no changes to be made to the transcripts. According to Yin (2018), the opportunity to review and make changes to data enhances the accuracy and validity of the study.

Transferability allows the findings to have applicability in other contexts (Amankwaa, 2016). Detailed and descriptions were sought out within this study to increase the transferability. Thick descriptions are detailed accounts of the experiences and perceptions from the lens of the participants. The detailed descriptions that were also provided could transfer to new contexts. The transferability of the study is limited because of the small sample size of the participants.

Dependability was addressed through the study by providing the study participants with transcripts of their interviews to allow for further elaboration and clarification of their data. The semi-structured interview approach used for this study allowed the interviewee to lead the discussion when points were important to the participant. Moreover, a detailed description of the coding process, how the data was analyzed, and the steps to recruit participants were addressed within the study to achieve dependability. Dependability allows the research process to be repeated by future researchers (Tracy, 2019).

Confirmability within a study ensures that the study is free of bias and prejudice (Patton, 2015). Participants reviewed the transcripts of the study to validate the perceptions during member checking. After each interview, I reviewed the transcripts to ensure the process that was conducted for all interviews was consistent. I also maintained an audit trail of my notes to ensure the confirmability of my thoughts and reflections. When coding the data, I ensured the codes reflected were the words and phrases from my participants and not my thoughts. My opinions were constantly monitored throughout the study to ensure my biases and opinions did not interfere with the integrity of the data.

Summary

The problem explored in the basic qualitative research study is that elementary principals inconsistently support teacher's mathematical literacy instructional strategies. The purpose of this basic qualitative study was to explore elementary school principals' and teachers' perceptions of the supports offered by elementary principals to elementary teachers in the area of mathematical literacy. In Chapter 4, I described the setting of the study and described the demographic data of the participants included in the study. This study was limited to a sample size of nine elementary principals and eight elementary teachers. The procedure that was used to obtain data was described, including the analysis of the data. Four themes emerged from the data analysis from the interview responses from the elementary principals and elementary teachers. The themes were: professional development, distributed leadership, makes time for collaborative efforts, and leadership practices.

In Chapter 5, I will describe the purpose of the study. I will also interpret the study's findings using the conceptual framework and the literature review as a guide. Then, I will discuss the limitations, recommendations for future study, and the implications for positive social change resulting from this study.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this basic qualitative study was to explore elementary school principals' and teachers' perceptions of supports offered by elementary principals to teachers in the area of mathematical literacy. This basic qualitative study involved two research questions to explore the phenomenon of this study:

RQ1: What are teachers' perceptions of principal supports offered to teachers of mathematical literacy practices within the math classroom?

RQ2: What are principals' perceptions of supports offered to teachers of mathematical literacy practices within the math classroom?

Seventeen participants, including nine elementary principals and eight elementary teachers were interviewed for this study via semi-structured one-on-one Zoom audio-recorded interviews. Findings of this study emerged from participants' perspectives and experiences which led to four themes: professional development, distributed leadership, making time for collaborative efforts, and leadership practices.

In this chapter, I interpret the study's findings, discuss limitations, make recommendations for future research, and share implications for positive social change.

Interpretation of the Findings

This basic qualitative study was conducted to explore elementary school principals' and teachers' perceptions of supports offered by elementary principals to elementary teachers in the area of mathematical literacy. This section includes information about the four themes that emerged through data analysis. The four themes were: professional development, distributed leadership, making time for collaborative

efforts, and leadership practices. I interpret teachers', and principals' perceptions of the principal support offered to teachers involving mathematical literacy practices within the math classroom through the lens of the transformational leadership theory. This section is organized by research questions and then themes.

Interpretation of RQ1

Theme 1: Professional Development

All eight teachers provided their experiences involving how the district's math department provided support for mathematical literacy strategies to implement within the classroom. Teachers expressed how the district continuously provided math support throughout the year to train teachers regarding strategies, curriculum, and best practices implement within the classroom. Participant T3 said, "we used to hear a lot about literacy directly from our school leaders; however, now we only hear about literacy more from the math department." The math department modeled mathematical literacy practices by grade level throughout the year on an ongoing basis.

Teachers also said through collaborative planning that math instructional lead teachers provided professional development regarding literacy practices to be implemented within the classroom. Teachers need ongoing professional development to understand critical thinking strategies in math. Collaborative planning was done weekly in many schools. However, professional development that was provided during collaborative planning was not ongoing. Five teachers expressed how they received professional development from the school regarding math, but it was not ongoing. Professional development provided by the school did not provide the support necessary

for teachers to implement their learning in the classroom. However, because of consistent support provided by the math department, teachers were able to build relationships with their peers to implement new learning when they forgot what was learned via professional development.

Theme 2: Distributed Leadership

Teachers expressed through coaching from the math ILT support was given to teachers for mathematical literacy strategies. Five teachers expressed that during collaborative planning, the math leader would emphasize the use of the math literacy mat within the curriculum. The math literacy mat had different math literacy strategies that could be used for different aspects of mathematical literacy. Two of the five teachers discussed how the math literacy mat was used frequently within their collaborative planning last year but was not used as much this year because the math literacy may was overlooked because of the emphasis on other resources within the curriculum.

All eight teachers emphasized that their math ILT provided the support that was necessary to implement mathematical literacy strategies. Three teachers expressed how their principal does not provide necessary support to implement math literacy strategies. However, by indirectly providing planning time and resources such as math ILTs, principals are providing instrumental supports needed to implement mathematical literacy strategies to teachers. According to Trace (2016), principals use instrumental support to focus on needs of teachers and completion of assigned daily tasks.

Through appraisal support, principals provide feedback to teachers that allow them to see their math ability and love of math. Teachers were able to be reflective about

their work through constructive feedback provided by principals (Littrell et al., 1994). This feedback motivated teachers to have conversations with their colleagues about the most effective math practices to be used within the building. Providing effective feedback to teachers shows principals' vision for the school and how they want to build capacities within teachers (Kouzes & Posner, 2017). Transformational leaders motivate teachers to a higher level. By pushing teachers to come out of their comfort zone, principals motivate teachers to implement math strategies for their grade level during collaborative planning.

Theme 3: Making Time for Collaborative Actions

When teachers have the creative freedom to use collaborative planning in a way that benefits them, collaborative efforts are most beneficial. In the school district where this study took place, collaborative planning happens weekly. During collaborative planning, school leaders were able to provide informational support about math literacy practices. Principals often act as listeners during collaborative planning sessions and not the facilitator.

Through peer observations, teachers gain appraisal from their colleagues that can assist in terms of implementation of math strategies. Through peer observations, teachers feel supported by principals and their colleagues because they can see their work in action and provide individual feedback. Effective math instruction occurs when school leaders discuss data to determine school goals and improve instruction to improve teachers' understanding of different mathematical literacy strategies (Killion, 2016).

Theme 4: Leadership Practices

Showing appreciation to teachers encouraged and motivated them to transform their practices. Mathematical literacy is a practice that is new to teachers. However, through feedback from principals, teachers were able to see how principals were open about what to improve within their classroom. The principal shows interest in the work when best practices are shared during collaborative planning and acts as a listener and not a leader during this time.

Interpretation of RQ2

Theme 1: Professional Development

As results indicated in Chapter 4, all nine principals expressed how the district's math department supports were instrumental in terms of teachers' implementation of mathematical literacy practices within the classroom. Professional development support given by the math department was for some schools the only ongoing professional development support for school teachers. Only two of the nine principals provided ongoing support for teachers involving mathematical literacy practices. However, because support was after school hours, other school-related factors became an issue that shortened the length of time for professional development to be successful. In 2020, however, because of the COVID-19 pandemic, elementary principals within the study expressed how mathematical literacy was not important because of the need to provide training to teachers regarding engagement strategies and technology.

According to Woszczak (2018), the role of principals is to provide resources to teachers so they may be successful. By encouraging teachers to attend math professional

development trainings, principals provide informational support needed to implement mathematical literacy practices. Support provided to principals from the math department was not informational because principals were only provided with a 30-minute session of training from the math department at the beginning of the year. Because of ongoing changes and other mandates and initiatives from the school district, principals were not prioritizing how to grow their mathematical literacy strategies when providing feedback to teachers. All nine principals relied upon their math ILTs to provide address changes and updates in the math department. Three principals were previous math teachers, so they relied on their experiences with math to provide support to teachers. For principals to serve as an instructional leader in math, they must be trained (Boston et al., 2017)

Because of their school's math goal, one principal provided more professional development opportunities for math instruction. However, because of the pandemic, professional development for math was not a priority. Only two principals out of nine provided time for ongoing professional development support regarding mathematical literacy.

Theme 2: Distributed Leadership

Elementary principals interviewed for the study were able to build and provide time for leaders within the school to implement the school's goals. Three principals shared how they had individual feedback with their teachers during collaborative planning about their math instruction this year. This involved increasing teachers' math content knowledge because it was apparent teachers' struggled with math. The teacher

was able to admit their struggles and asked the principal if they could work with the ILT for math assistance.

Elementary principals interviewed for the study understood that the roles they had within the school building did not allow them to provide effective feedback regarding mathematical literacy strategies compared to the Math ILT. Principals who did not have a math background struggled with supporting teachers with mathematical leadership.

To carry out the school's mission and vision, principals must delegate tasks within the school to individuals that challenge them instructionally and help them grow personally and professionally. Transformational leaders encourage their followers to be leaders.

Theme 3: Making Time for Collaborative Actions

By consistently creating time for teachers to collaborate, elementary principals have challenged the process for teachers to grow and change. Principals have challenged this process by allowing teachers to grow their capacity to lead and provide resources needed via collaborative planning to learn new strategies for them to implement. Through collaborative planning, teachers can build relationships with their colleagues to share ideas and struggles within the classroom. The principal may or may not be a part of collaborative conversations, but does allow teachers consistent time for planning. Consistent planning allows teachers to focus on goals of the organization and work towards those goals. During collaborative planning, the principal can act as a listener and not as a leader. Teachers and ILT lead conversations and not the principal.

Providing a focus for learning walks on math discussion tools during math aligns with the school vision of improving mathematical literacy concepts. Through learning walks, teachers and the schools' leadership team can see the practice in action. After the walk, the team collaborates to make a plan of action for the school for professional development based on the walk's focus. Through learning walks, informal observations, and formal observations, principals and the school team motivate followers. When feedback is given on a task, motivation increases (Kouzes and Posner, 2012)

Limitations of the Study

According to Saldana (2016), transferability combines other studies to transfer and compare the theory and study. Nine principals and eight principals were interviewed for this study using a semi-structured interview format. The 17 participants provided detailed, vivid descriptions and accounts of the participants' experiences and perspectives for analysis. The study participants all came from the same local district, so there were similarities of experience in terms of planning and potential expectations. Including participants from different school districts across the country might have impacted the study's findings. The perceptions of only elementary teachers and elementary principals were used, so the study results may not be transferable to a middle or high school setting because the studies focus on elementary.

According to Yin (2016), a researcher needs to consider any biases that may influence the study's findings. As a math instructional leader at the research site, it was vital for me to be aware of the biases I may bring to the study. I made sure to follow the

interview protocol during the interview process. I used the results and the notes of the transcript taken during the interview to critically analyze the collected data.

Recommendations

There was a gap in research regarding principal supports offered to teachers in the area of mathematical literacy; this study contributes to the research by adding to the discussion on the perceptions of the principal supports in the area of mathematical literacy. The findings from this study can be used at the research site of the study. Exploring the perceptions of principals and teachers from middle and high schools from other similar districts to compare and see if the mathematical literacy supports they receive are similar or different would broaden this research further. Because the math Instructional Lead Teacher was used by teachers and principals as a support to implement mathematical literacy practices in the classroom, I recommend conducting a study on the perceptions of math ILT's as participants of the study to see what are their perceptions of the principal supports they received to implement mathematical literacy practices in the school. Because of the small sample size of participants, increasing the number of participants interviewed for the study to explore the perceptions of more principals and teachers to see if the same themes emerge. Also, this study only had elementary teacher participants who had more than seven years of experience as a teacher. Teachers expressed how they did not receive as much support from their principal because they were not considered novice teachers. Elementary teachers who are new to the profession might emerge with different themes. I also recommend further research on training principals on their content knowledge of mathematical literacy topics over the year.

Additionally, teachers identified several leadership practices and professional developments that motivated them to implement math strategies within the classroom. However, the school-based professional developments that were offered were not practical because they were not ongoing. It is recommended that the school district examine the professional development offerings at schools to create ongoing professional development opportunities that cater to the needs of the teachers regarding mathematical literacy practices, such as the math department has offered professional development opportunities.

Implications

The implication for positive social change within this study may impact the academic success of elementary math students. The findings from this study may provide teachers and administrators with the additional support necessary to motivate teachers to implement mathematical literacy strategies in the classroom. Students in Maryland are struggling to meet proficiency in mathematics (Maryland State Department of Education, 2019). Students are struggling with having productive discussions in math because they are not engaged in representing math in multiple ways. (Rodriquez & Bonner, 2018). Students need to have the mathematical understanding to have productive discussions on the multiple solutions (Rodriquez & Bonner, 2018). When math is not connected to mathematical literacy or conceptual knowledge, students cannot progress in math (Lochmiller, 2016). Understanding the supports offered to teachers from principals may encourage principals to modify the supports that are effective and not effective to increase academic success in the classroom.

Conclusion

The purpose of this basic qualitative study was to explore elementary school principals' and teachers' perceptions of the supports offered by elementary principals to elementary teachers in the area of mathematical literacy. Data was collected via semi-structured Zoom one-on-one recorded interviews. Participants for this study included nine elementary principals and eight elementary teachers.

Principals must provide an environment that offers support to teachers to improve teacher growth and practice in mathematical understanding and literacy (Lochmiler and Cunninghan, 2019). With an intense focus on offering supports to teachers that build their awareness and implementation of mathematical literacy skills, we may foster student critical thinking to produce effective discourse through reading, writing, application, problem-solving, and talking in math. Transformational leadership practices must be developed within principals that offer supports for mathematical literacy through professional development, distributed leadership, and making time for collaborative efforts to foster continuous change and implementation of new learning into the classroom. The principal supports that have proved effective for implementing mathematical literacy strategies for principals and teachers may inform district leaders of the types of supports needed for teachers and principals to implement math literacy strategies with fidelity.

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Appendix A: Interview Questions

Research Question	Interview Question
1. What are the teachers' perceptions of the principal supports offered to teachers of mathematical literacy practices within the math classroom?	• What is your belief of an effective math teacher? • What is your definition of mathematical literacy? • What are your thoughts on principal support? • What are some characteristics of a lesson that uses effective mathematical literacy strategies? • What is your belief of an effective principal? • What types of support do you need when implementing mathematical literacy skills within your mathematics classroom? • Do you think you receive the supports necessary for implementing mathematical literacy skills within your mathematics classroom? Why or Why not? • What type of supports do you acquire to implement mathematical literacy strategies within your mathematics classroom?
2. What are the principals' perceptions of supports offered to teachers of mathematical literacy practices within the math classroom?	• What is your belief of an effective math teacher? • What is your definition of mathematical literacy? • What are your thoughts on principal support? • What are some characteristics of a lesson that uses effective mathematical literacy strategies? • What is your belief of an effective principal? • What types of support do you believe are necessary to provide teachers to implement

	mathematical literacy skills within your mathematics classroom? • Do you think you provide the supports necessary for implementing mathematical literacy skills within mathematics classrooms within your school? Why or Why not? • Do you think you receive the supports necessary for implementing mathematical literacy skills within your school? Why or Why not? • What type of supports do you acquire to implement mathematical literacy strategies within your school?

Appendix B: Demographic Questionnaire

Practitioner's Name _____ Date_____

What is your gender?

_____Male

_____Female

How long have you taught or been teaching math? _____

How long have you been an administrator? _____

How long have you observed and provided feedback to teachers on math?

_____

Have you attended or offered any professional developments on implementing mathematical literacy strategies in the classroom?

_____Yes

_____No

Appendix C: Interview Protocol

Date:

Time:

Interviewee:

Before the interview, it is crucial to describe the process of the study, and the interview proves the participant will participate for the next hour. The participant will be informed of how the data will be treated and obtained and how confidentiality will be maintained before, during, and after the interview. Then, I will review the informed consent form emailed to the participants to ensure all questions were answered before the interview. The interviewee will then confirm their statement of consent that was emailed, and then the interviewing with the OLYMPUS VN-541PC noise-canceling audio recorded will occur.

After the interview, it is essential to thank the interviewee for participating in the study. The interviewee will be reminded of the confidentiality of the data that was obtained through the interview. The interviewee will then be informed how a transcript of the interview will be provided within three days of the interview for their review. The transcript will be provided to the interviewee to review for accuracy. If any adjustments need to be made to the transcript, the interviewee will contact the interviewer via email or personal phone.