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High School Principals' Perceptions and Instructional Leadership Practices Regarding Algebra I State Scores

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,

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Abstract

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States are double scheduling algebra classes; using calculators and virtual manipulative-like algebra tiles; and applying interventions such as Response to Interventions, needs assessments, and various computer graphing technology such as Demos. However, during the school year 2018-2019, 12.9 percent of a state public school students failed to meet passing score requirements on the state algebra test and were at risk of not graduating. The purpose of this research was to examine school principal perceptions and instructional leadership practices supporting mathematics teachers to help students to improve their proficiency in Algebra I. A basic qualitative research design, grounded in instructional leadership practices and Hitt and Tucker's unified framework, was used to examine principals' application of instructional leadership practices. The research question of this study addressed principals at the high schools under study regarding instructional leadership practices supporting mathematics teachers to help students to improve their proficiency in Algebra I. Data were collected by semistructured interviews and analyzed through coding and thematic analysis. Findings from the study were that high school principals applied instructional leadership practices through (a) building strong relationships, (b) facilitating high-quality learning experiences, and (c) building professional capacity. Recommendations for best principal instructional leadership practices in support of teachers' daily instructional practices to help students improve proficiency in Algebra I could be made based on data collected from this study. Findings may contribute to positive social change by aiding principals in applying instructional leadership practices to help teachers assist students with Algebra I proficiency and increasing algebra state scores.

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Dedication

First, to my Lord and Savior, I give thanks and praises for allowing me the opportunity to take this journey in good health, strength, and a sound mind. To my number one cheerleader, James my husband, you never doubted I could complete this journey and continued to push me and stand by me all the way. I love you for your patience and unconditional love, not only through this journey but in all things.

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To Dr. Peter Kiriakidis, thank you for your guidance through this EdD process. This has truly been a long journey and my chair has been with me from start to finish, thank you. To my second committee member, who came in later in this journey and worked with me tireless all the way to the finish line, a very special thank, I will forever been grateful to you for all you have done to get me to the finish line.

Table of Contents

List of Tables

Chapter 1: Introduction to the Study

States are double scheduling algebra classes (Knudson & Sorensen, 2017); using calculators and virtual manipulative-like algebra tiles (Bouck et al., 2019); and applying interventions such as Response to Intervention (RtI) (Lyons et al., 2019), needs assessments, and various technology such as Demos (Dibbs et al., 2020). However, during the school year 2018-2019, 12.9 % (4,209) of Mississippi public school students failed to meet passing score requirements on the state algebra test (Mississippi Department of Education, 2019a) and were at risk of not graduating. The research site for this study was a public school district located in Mississippi that requires students to pass an Algebra I course and take an algebra state test and meet or exceed a predetermined pass performance level (or meet alternate route criteria if passing performance level is not met). Public school students' skills, knowledge, and academic growth from Grade 3 through Grade 8 are measured using annual assessments in English language arts (ELA) and mathematics and in high school using Algebra I and English II end-of-course assessments. The annual assessments, first administered during the school year 2015-2016, make up the Mississippi Academic Assessment Program (MAAP) (Mississippi Department of Education, 2018d). Mississippi teachers helped design MAAP assessments that have five predetermined levels to score students' performance: Minimal Level 1, Basic Level 2, Pass Level 3, Proficient Level 4, and Advanced Level 5 (Mississippi Department of Education, 2016). Students reaching Level 3 or higher on the state algebra test meet one of several graduation requirements for high school. MAAP

aligns with classroom instruction (Mississippi Department of Education, 2019d) and, as such, MAAP scores reflect student proficiency in algebra.

The City Public School District (CPSD), a pseudonym for anonymity of the research site for this study in Mississippi, is a small comprehensive K-12 school system with more than 2,100 students in Grades pre-K through 12. The district has three elementary schools: one lower elementary contains prekindergarten and Grade 1, one middle elementary contains Grade 2 and Grade 3, and one upper elementary contains Grade 4 and Grade 5. The district has two high schools: one junior high school contains Grade 6 through Grade 8, and one senior high school contains Grade 9 through Grade 12. The district offers a variety of clubs, activities, sports, band, and other special programs such as gifted and dual enrollment education programs to meet the needs and interests of a diverse student body.

The administrative structure for CPSD starts with the district board of education and the superintendent of education who reports to the district school board. Each of the elementary schools has one principal, and each of the high schools has one principal and two assistant principals. In addition to principals, each school has teachers, counselors, teacher assistants, and custodians, and each elementary teacher has a teacher assistant. At each high school, principals designate specific duties for each assistant principal that usually includes various administrative, curricular (including instruction), and behavior issues duties.

CPSD has a long history of excellence in education and takes great pride in its personalized approach to educating its students in relatively small classrooms of instruction. Student support systems are strong, and so is community support. The district pursues academic excellence, as reflected in its deep belief that all students can learn and deserve high-quality instruction. During the school year 2018-2019, an accountability rating of B motivates the site district to move its mark of excellence with consistent research-based practices and behaviors necessary to maintain and sustain academic excellence moving forward. Research for this study focused on high school principal perceptions and instructional leadership practices (ILPs) in support of mathematics teachers to help improve student proficiency in Algebra I.

Teachers, at the study site, had voiced concern to senior district administrators that school principals were inconsistently applying ILPs to support mathematics teachers for students to improve their proficiency in Algebra I (senior district administrator, personal communication, March 27, 2019). According to the District Board Minutes documents between 2016 and 2019, teachers had voiced concern that school principals struggle as instructional leaders to support them (Board Minutes 2019, study website). The problem was that school principals at the high schools under study had been inconsistent in applying ILPs supporting mathematics teachers for students to improve their proficiency in Algebra I. ILPs for this study referred to purposeful educational behaviors and actions by school principals aimed to improve teaching and to improve learning for all students (Shaked et al., 2017). Potential findings of the study may include new information about school principals' perceptions, and application of ILPs to promote

student proficiency in Algebra I. Findings may contribute to positive social change by principals' consistent application of ILPs to help teachers assist students in improving their Algebra I proficiency. The study's findings may also guide future research in school leadership and the development of effective principal leadership in practice.

Teaching and learning are central in educational systems because every school's primary goal is to ensure students are learning. School principals' expected leadership is to provide hands-on leadership to one of the most critical organizations in society, the school (Tshannen-Moran & Gareis, 2017). Foundations of organizations are made vibrant and strong by effective leaders strategically guiding and overseeing the establishment and application of organizational processes (Jabbar & Hussein, 2017). Principals of the 21st century are regarded as stewards of learning for staff, community, parents, and students (Benade, 2017; Corcoran, 2017). Zakso et al. (2018) believed that principals, expected expert managers with excellent supervisory skills, should provide leadership that promotes student learning. A top priority for the principal, as an instructional leader, is the quality of instruction teachers provide for their students (Karadag, 2018). In expectation of narrowing the achievement gap between students, the emphasis has shifted to high expectations for all students (Bhebhe & Nyathi, 2019). School principals are responsible for setting and establishing a vision of high achievement and academic success (Day et al., 2016).

Education is the key to success in life, with educators positioned to have lasting positive or negative influences on students' lives (Strayhorn, 2019). Educators' daily

interactions with students are essential and should be intentional and purposive in meeting students' needs (Tirri, 2018). Every student should acquire the necessary skills to secure a future filled with prosperity to function as a useful citizen in society (Rebell, 2018). Educators should succeed in preparing students to successfully meet all required criteria for high school graduation and plans for careers and/or college (Kolluri & Tierney, 2019). Despite years of education reform, many students fail to meet passing score performance levels on state tests and are at risk of not or delaying graduation from high school (Rebell, 2018). School principals should apply their ILPs to support teachers' instructional practices that affect students' proficiency in algebra as measured by algebra state scores in public schools (Jolly & Robins, 2016).

In Chapter 1, I include the proposed problem, purpose, and research question of the study. Chapter 1 also contains a summary of research literature related to the scope of the proposed study of principals' perceptions and ILPs regarding algebra state scores. In addition to the study's nature, an explanation of the conceptual framework used to ground the study is in Chapter 1. The last part of the chapter includes definitions for clarity, specific to principals' perceptions, and application of ILPs regarding proficiency in Algebra I and assumptions, scope and delimitations, and limitations.

Included in Chapter 2 are the literature search strategy description, and key terms and concepts used in the literature review. In addition to a description of my role as the researcher, included in Chapter 3 are descriptions of the research design and rationale. The methodology included in Chapter 3 includes procedures for recruiting participants,

data collection, and a data analysis plan. Included also in Chapter 3 are discussions of the trustworthiness and ethical procedures for this study.

Background

Between 1993 and 2000, a federal focus existed on Standards-Based Reform. The Elementary and Secondary Education Act (ESEA), the current federal K-12 education law that has been in existence for 55 years, was reauthorized in 1994 when President William Jefferson Clinton signed Improving America's Schools Act. The law supported four key research elements (U.S. Department of Education, 2016) for comprehensive education reform: (a) establish high standards for all students (DeBray, 2016), (b) facilitate professional experience to support teachers in preparation to teach high standards (Kloser et al., 2019), (c) allow flexibility to stimulate local initiatives in conjunction with accountability results (Cook-Harvey & Stosich, 2016), and (d) promote collaboration with families, communities, and schools (Anderson-Butcher et al., 2020).

Standards-Based Reform encompasses part of all of four elements, according to Hamilton et al. (2008): (a) expectations of what students should know and be able to do, (b) high expectations to promote attainment, (c) measure outcome with assessments of student achievement, (d) schools and states sole responsibility of curriculum and instruction decisions, (e) improvement of educational system fostered with technical assistance, and (f) accountability provisions for schools and students rewarded and sanctioned based on performance measures. Muñiz (2019) supported the use of standards to guide and direct all educators' actions with intentional actions to improve practice and

student proficiency, resulting in student achievement. Accountability and assessment laws in the federal education law Every Student Succeeds Act (ESSA) mandate focus on student growth from year to year to evaluate administrators, students, teachers, schools, and school districts (Hou et al., 2019). Such accountability and assessment initiatives have caused the principal's role in education to evolve from being solely a managerial one to a dual managerial and instructional leader role (Terosky, 2016). Federal education laws require schools and educators to make more research-based decisions related to teaching and learning that result in increased student proficiency that leads to student achievement (Lac & Mansfield, 2018).

The nation's public high school graduation rate for the school year 2017-2018 was 85%, but the rate was 84% for Mississippi (National Center for Education Statistics, 2020). Attendance, behavior, and course performance, known as "the ABCs," have been identified as strong predictors of high school completion (U.S. Department of Education, 2016). Students drop out of school for various reasons, and research also reveals that students who fail Algebra I are at high risk of dropping out of school (American Institute for Research, 2017). Algebra is a foundation course for more advanced mathematics courses, science courses, and STEM courses. Also, algebra is typically required for students to graduate high school (Smith & Freels, 2017). Smith and Freels (2017) revealed five strategies that districts and schools might use to help struggling students improve their proficiency in Algebra I: curriculum alignment, instructional coaching, instructional practices, professional development, and additional learning supports. Scholars argue that additional focused instructional time is necessary for struggling

students to achieve similar results on tests for students who do not struggle (Cattaneo et al., 2016). The focus for this is the principal's perceptions and ILPs in support of mathematics teachers to help students improve their proficiency in Algebra I.

A large body of research exists on instruction leadership and school effectiveness (Özdemir et al., 2020). Similarly, many studies have examined principal instructional leadership as an essential factor in creating effective schools and improving student proficiency that leads to student achievement (Tan, 2018). Although researchers have not entirely ignored principals' ILPs influence on student achievement (Handford & Leithwood, 2019; Liebowitz & Porter, 2019; Lochmiller, 2016; Schrik & Wasonga, 2019; Turkoglu & Cansoy, 2018), to date, little research has focused on principals' ILPs concerning specific subject areas.

During the school year 2016-2017 for its K-12 curriculum, Mississippi fully adopted the national Mississippi College and Career Readiness Standards (MCCRS) (Mississippi Department of Education, 2018e). MCCRS are grade- and course-specific standards to progress students toward the workforce and postsecondary study (Mississippi Department of Education, 2018e). MAAP assessments, designed to evaluate student performance based on classroom instruction, are aligned to MCCRS. Therefore, Mississippi student scores on algebra state tests are due to classroom instruction, and hence student proficiency in algebra can be measured based on those scores. The primary intent of MAAP is to provide the information needed from the program design and state-level decisions to (a) determine how schools and districts are meeting performance

standards; (b) identify school, district, and state-level educational needs; (c) provide information to aid in the development of policy issues and concerns; (d) provide a basis for comparisons among public school districts; and (e) produce data useful for identifying processes and exceptional and at-risk programs (Mississippi Department of Education, 2018e).

Accountability requirements placed on schools intensify the importance of student proficiency that leads to student achievement. Expectations placed on principals and school districts to reach predetermined performance levels based on individual student performance on state tests emphasize the need for principals to consistently apply ILPs to improve algebra proficiency, which leads to student achievement. This study was needed to understand principals' perceptions and ILPs to improve student proficiency in Algebra I, leading to increased algebra state scores. Research for this study helps educators to address items for Mississippi state board of education 5-year Strategic Plan for 2016-2020, unveiled in December of 2014. The plan, initiated to transform Mississippi public education to improve educational outcomes for every public school student in the state (Mississippi Department of Education, 2019b), was drafted with the following goals for every student: (a) proficient and show growth in all assessed areas; (b) graduate from high school, ready for college and/or career; and (c) school and district accountability ratings are "C" or higher. A need exists for more research on principal instructional leadership and student achievement.

Students who initially fail to meet or exceed passing performance levels on the state algebra test are usually faced with challenges associated with maintaining current

academic requirements while preparing to meet passing performance level with second or subsequent administrations of the state algebra test. Principals' consistent use of research-based principal ILPs to improve algebra proficiency may promote positive social change of increased graduation rates and decreased dropout rates. Recommendations for best principal ILPs in support of teachers' daily instructional practices to help students improve proficiency could also be made based on educators' purposeful use of data to be collected for this study. Findings from this study may also promote positive social change that results in an increased number of teachers teaching with a deeper understanding of how students develop mathematical proficiency. The potential increase of morale and the working environment for teachers may occur with principals' successful, consistent application of ILPs in support of teachers' instruction. The findings of this study may provide more insight into specific principals' perceptions and ILPs for prioritizing and applying behaviors and strategies for positive learning environments that promote student proficiency that leads to student achievement.

Problem Statement

The problem addressed in this research was that school principals at the high schools under study had been inconsistent in applying ILPs supporting mathematics teachers for students to improve their proficiency in Algebra I. School district administrators decided to concentrate principal support of mathematics teacher instruction with the intention to increased student proficiency in algebra, based on a review of algebra state score results between 2016 and 2019 (Table 3) and recent teacher complaints of inconsistent principal instructional leadership (senior district administrator,

personal communication, July 15, 2019). Accountability grades for Mississippi schools and districts are rated based on points earned (1000 total) in seven categories: reading, mathematics, and other subjects (Science proficiency and U. S. History proficiency), acceleration, college and career readiness, English language progress, and the graduation 4-year rate (Mississippi Department of Education, 2018b). Proficiency in algebra, also referred to as *student achievement*, is the percentage of students meeting passing performance level on state tests (Mississippi Department of Education, 2019a). Growth measures the percentage of students making progress, specifically in algebra for this study, and is also measured separately for lowest-performing students based on test results. The graduation rate is the percentage of students graduating within 4 years.

Each public school and district in the state are assigned an accountability rating of A, B, C, D, and F based on established criteria regarding individual student growth, student achievement, graduation rate, and participation rate of Mississippi Statewide Accountability System (MSAS). Although a numeric academic grading system is widely accepted and used in the world, the U.S. academic grading system is different and commonly uses five letter grades: A+, A, A-; B+, B, B-; C+, C, C-; D+, D, D-; and F. A+ is the highest score possible, and F is the lowest (Brookhart et al., 2016). For secondary students, assigned letter grades represent academic performance: A is excellent, B is good, C is average, D is pass, and F is a fail. In 2012, Mississippi initiated a system of grading all schools' and districts' accountability on an A through F grading scale. Like students and state accountability ratings from the school year 2013-2014 to present, accountability ratings reflect the A through F scoring system. A school or district earning

an A accountability grade indicates the highest status, highest growth, and subgroup growth (Mississippi Department of Education, 2018c).

Since application, A through F school grading has consistently raised the bar. The outcome is that more students perform at grade level, high school graduation rates continue to rise, and students are more prepared for college and careers (Mississippi Department of Education, 2019a). The A through F school grading system provides the states, parents, schools, communities, and state leaders with the information they need to ensure every student receives a quality education they deserve. According to the Mississippi State Department of Education (2018), "MAAP tests measure student knowledge of MCCR standards that guide classroom instruction and focus on the critical thinking, problem-solving, and reasoning skills students need for success in higher education and the workforce" (p. 1). The MAAP does measure proficiency, and scores on MAAP tests figure into calculations of individual school and individual district accountability grades. Accountability measures for schools, school districts, and states are provided annually by the Office of District and School Performance (Mississippi Department of Education, 2018a). For accountability ratings, scores on statewide tests in mathematics, reading, Algebra I, English II, biology, and U.S. history determine growth and growth proficiency for students in Grades 3 through 8 and high school. With an assessment participation rate lower than 95%, schools' and districts' accountability ratings decrease one letter grade.

Between 2016 and 2019, the number of Mississippi public school districts receiving an A accountability rating showed a steady increase (Table 1). Mississippi

school districts' math proficiency also showed steady growth between 2016 and 2019 (Table 2). Recent state school district data shows that students' proficiency and growth in algebra have continued to increase from year to year. In 2019, Mississippi school district report data revealed a 47.0 % growth compared with a growth of 43.2% in 2018 and a 33.5% growth in 2017 (Table 2). Graduation rate data for the state have also shown an increase of 84.0% in 2019 compared with 82.3% in 2017 (Table 2). However, a significant number of students in the state fail to meet or exceed mandated passing score levels on the state-mandated algebra test required for high school graduation (Mississippi Department of Education, 2019a; National Assessment of Educational Progress, 2017). For the school year 2018-2019, 49.3% of Mississippi students scored proficient or advanced in algebra, and 37.8% scored passing (Table 3). The number of Mississippi students failing to meet the state algebra test's passing levels has steadily decreased from 20.1% in 2016 to 12.9% in 2019 (Table 3). The number of CPSD students failing to meet passing performance levels on the state algebra test has also steadily decreased from 19.0% in 2017 to 6.4% in 2019 (Table 4 and Table 5); however, for the School Year 2018-2019, 12.9% of Mississippi students failed to meet passing scores on the state algebra test. By 2025, Mississippi has a strategic plan in place for improving student proficiency and achievement in mathematics and ELA so that at least 70% of all students to be proficient (Mississippi Department of Education, 2019d).

State school districts' proficiency and growth in specific areas are of significant concern and interest to schools, school districts, educators, students, parents, communities, and other stakeholders. Therefore, superintendents, principals, and teachers

must strategically plan actions that include the consistent application of research-based instructional practices and initiatives to support increased student proficiency and higher academic achievement. Better student outcomes are necessary for student growth, which leads to increased scores on state-mandated tests. National rankings of rising graduation rates and achievements in advanced placement, as reflected in the National Assessment of Educational Progress (2017), revealed students are rising to higher expectations, and new accountability rating cut scores mandates.

Table 1

Mississippi School Districts Accountability Grades Summary

Grade	2016	2017	2018	2019
	Count (Percentage)	Count (Percentage)	Count (Percentage)	Count (Percentage)
A	14 (9.8%)	15 (10.3%)	18 (12.2%)	31 (21.4%)
B	39 (27.3%)	43 (29.5%)	42 (28.6%)	35 (24.1%)
C	36 (25.1%)	43 (29.5%)	37 (25.2%)	35 (24.1%)
D	35 (24.5%)	36 (24.7%)	28 (19.0%)	23 (15.9%)
F	19 (13.3%)	9 (6.2%)	22 (15.0%)	19 (13.1%)
N/A	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (1.4%)
Totals	143 (100.0%)	146 (100.0%)	147 (100.0%)	145 (100.0%)

Note. From 2018 Accountability by the State Department of Education, 2019.

Table 2

Mississippi School Districts Proficiency and Growth Areas

Areas	2016	2017	2018	2019	Change[a]
Math Proficiency	31.2%	33.5%	43.2%	47.0%	3.8%
Math Growth	58.3%	59.5%	62.9%	65.5%	6.4%
Graduation Rate	81.2%	82.3%	80.0%	84.0%	4.0%

Note. From "State Report Card 2018-2019" by State Department of Education, 2018a.

[a]Change (2018-2019) refers to the percentage difference from 2018 to 2019. For example, Mississippi school district math proficiency changed from 43.2% in 2018 to 47.0% in 2019 and 47.0% minus 43.2% results in 3.8% change.

Table 3

State Algebra I Mississippi Academic Assessment Program (MAAP) Results

Performance	2016	2017	2018	2019
Minimal	2.4%	2.7%	2.0%	1.6%
Level 1				
Basic	17.7%	16.2%	13.4%	11.3%
Level 2				
Pass	41.4%	38.7%	38.0%	37.8%
Level 3				
Proficient	32.9%	34.9%	38.3%	39.7%
Level 4Advanced Level 5	5.6%	7.5%	8.2%	9.6%

Note. Mississippi Department of Education, 2019a. Mississippi Academic Assessment Program (MAAP) results.

Table 4

City Public Schools District: Algebra I MAAP Results

Performance Level Descriptor	2017 Percentage	2018 Percentage	2019 Percentage
Minimal Level 1	2.6%	0.70%	1.1%
Basic Level 2	16.4%	9.79%	5.3%
Pass Level 3	34.5%	31.47%	36.0%
Proficient Level 4	29.3%	46.15%	38.6%
Advanced Level 5	17.2%	11.89%	19.09%

Note. Mississippi Department of Education, 2019a. Mississippi Academic Assessment Program (MAAP) results.

Table 5

City Public Schools District: Algebra I MAAP Results: Minimal (Level 1) and Basic (Level 2)

Performance Level Descriptor	2017 Percentage	2018 Percentage	2019 Percentage
Minimal and Basic	19.0%	10.49%	6.4%

Note. Mississippi Department of Education, 2019a. Mississippi Academic Assessment Program (MAAP) results.

As the instructional leaders of their schools, principals are expected to manage instruction and are accountable for their success or failure (Yoo, 2016). Tractenberg et al. (2017) stated that principal instructional leaders are also responsible for ensuring teachers have the necessary support, resources, and tools to teach and instruct students successfully. Practices of principal instructional leaders focused on teaching and learning may lead to student proficiency and achievement (Hou et al., 2019). Instructional leadership frameworks contain a definition of *instructional leadership* and identify instructional leadership activities, and Hitt and Tucker (2016) showed specific instructional practices to have positive effects on student achievement. Principals' consistent application of ILPs in support of teacher's effective research-based instructional practices have positive effects on student achievement (Rensburg et al., 2017).

Algebra and Student Achievement

Algebra plays a significant role in school mathematics. Many students struggle with mathematics, and their opportunities to pursue other mathematics courses and college and career options are affected by algebra decisions and outcomes in school (Grønmo, 2018). U.S. high schools teach mathematics differently than other countries do (Hart, 2020). For most high schools in the United States, the sequence of mathematics courses taught begins with ninth-grade Algebra I, 10th-grade geometry, and 11th-grade Algebra II (Richards, 2020). Student placement in algebra dictates the sequence of mathematics courses in high school Gewertz (2019). Scholars have suggested that students who start algebra early have more success in secondary school mathematics (Knuth et al., 2016).

Accountability, testing, and student achievement have been topics of much research during the last few years. Mathematics and student achievement have been an important research topic for several decades (Hart, 2020; Sparks, 2015). The latest results from an international exam administered in 2018 to teenagers ranked U.S. students 30th in mathematics literacy, which includes algebra out of 64 countries, up from 35th in 2015 (OECD, 2018). U.S. scores appear satisfactory at first glance, but a review of overall scores reveals that, since 2015, there has been no improvement in scores. U.S. students' mathematics mean score showed a slight improvement in 2018 of 478 compared with the 2015 mean score of 470. Even more troubling among the test results is a widening international performance gap in education (Chmielewski, 2019).

K-12 mathematics education has been a constant national concern. A common belief in mathematics education is that students must learn deeper and improve proficiency and performance in mathematics (Smith & Freels, 2017). Knuth et al. (2016) believed that a strong mathematical knowledge and performance base was one way to ensure student success in algebra. Because of algebra's foundational role in all areas of mathematics, scholars suggest algebra is the key to success in mathematics (National Council of Teachers of Mathematics, 2000; National Mathematics Advisory Panel, 2008; RAND Mathematics Study Panel, 2003). Algebra is well known as the gatekeeper to students' success in higher mathematics (Knuth et al., 2016). Laughbaum (2017) suggested that algebra is a gatekeeper in two levels: Level 1 is high school as verified by a large number of students required to retake high school algebra in college, and Level 2 is remedial taught in developmental math programs in colleges. In 2016, 59% of high school students were ill prepared for college-level mathematics (ACT, 2016). Two-year college remedial students' graduation rate is in the 10% range, and 4-year colleges are in the 35% range (Blair et al., 2017). These numbers represent a problem because every state requires algebra, and many majors in college require algebra and need to be addressed (Hart, 2020; Laughbaum, 2017).

Accountability for student achievement has led to principals' increased expectations to take on major instructional leadership roles in guiding teaching and learning that results in improved student achievement (Shirrell, 2016). A gap in research practice exists regarding how school principals apply their ILPs to improve Algebra I proficiency. Although research has shown principals need to be instructional leaders

(Allen et al., 2015; Lee & Lee, 2020; Sebastian et al., 2017), little research indicates the principals' role (Kraft & Gilmour, 2016; Lavigne & Chamberlain, 2016) in applying instructional leadership for increased student Algebra I proficiency. As a part of teacher evaluation, many states require principals to observe teacher instruction several times throughout the school year (Neumerski, 2018). In this study, I sought to understand principals' perceptions and ILPs that help students improve their Algebra I proficiency. The problem is current, relevant, and significant to the discipline because many students in the southern state fail to meet passing scores requirements on the algebra state test (Mississippi Department of Education, 2019a). During the School Year 2018-2019, of the 32,620 students who took the state algebra test in Mississippi, 12.9% of the students did not meet passing performance level on the state algebra test (Table 3) (Mississippi Department of Education, 2019a). Findings may contribute to positive social change by principals' consistent application of ILPs to support teachers to help students to improve their proficiency in Algebra I.

Student success or failure is a result of the instruction they receive. Several factors affect student proficiency in mathematics that include instructional practices (Enu et al., 2015; Mazana et al., 2019). Mathematical ability and skills are essential and crucial to the technological and scientific development and economic success of societies and countries because mathematical skills are necessary for understanding other disciplines such as social sciences, engineering, and the arts. The multidimensional role mathematics plays in technology and science, and its application fully extends and expands to all areas of technology, science, and business enterprises. Mathematics became a key subject in the

school curriculum because it is crucial and engulfs so many disciplines and entities. The mathematics curriculum intends to equip students with essential skills and knowledge in the world that is transforming technologically (Ngussa & Mbuti, 2017).

Algebra matters and student mastery of algebra is considered a gateway for preparation into higher-level mathematics courses required to prepare students for college and careers (Snipes & Finkelstein, 2015). The number of students taking algebra by the end of eighth grade was increased by some school districts across the country to diversify access to college-preparatory mathematics. Morton and Riegle-Crumb's (2020) study results revealed, from the U.S. Trends in International Mathematics and Science Study of 2011 (TIMSS), eighth-grade algebra instructional content varies significantly between schools with predominantly minority students versus schools with predominantly not minority students. Schools with predominantly minority students' algebra instructional content were significantly lower than their peers.

Several school reforms have been implemented during the last 2 decades to increase student achievement, especially for some socioeconomically disadvantaged students such as Hispanic students and students of color (Garcia & Weiss, 2017; Smith et al., 2020). Historically, an achievement gap has existed between advantaged and disadvantaged students (Flores, 2017). Park (2018) reported that school principals' ILPs positively affect student learning and achievement. ILPs should establish a school environment conducive to learning that guides and directs students to successful academic achievement. Research exists on instructional practices and student achievement generally concerning teachers (Branson et al., 2015).

Leadership qualities of principals are also crucial in the consistent application of strategies of ILPs for increasing student proficiency and achievement. Stockard (2019) and Stronge, Richard, and Catano (2020) revealed several common qualities of a competent principal and stated that principals' decisions and the application of strategies regarding instruction have a direct influence on student achievement. Student proficiency and achievement are a reflection of principals' instructional decisions and applications of practices. Therefore, principals' ILPs to support teachers' instruction to help students improve their Algebra I proficiency is connected to state algebra test scores.

Mississippi school principals' effectiveness is measured year-to-year based on student growth using the Mississippi state accountability and assessment model. In addition to the whole district receiving an accountability rating or grade score, each school in the district and the whole state also receives an accountability rating or grade score based on the same accountability system. The overall Mississippi state accountability rating or grade score for the school year 2018-2019 was a C. Mathematics (which includes algebra state scores) accounts for 28.5% of the school district's accountability rating or grade score.

Purpose Statement

The purpose of this research was to examine the perceptions of school principals at the high schools under study regarding ILPs supporting mathematics teachers to help students to improve their proficiency in Algebra I.

Research Question

The research question that guided this study was:

What are the perceptions of school principals at the high schools under study regarding ILPs supporting mathematics teachers to help students to improve their proficiency in Algebra I?

Conceptual Framework

Instructional leadership was the concept that grounded this study. *Instructional leadership* refers to activities focused on instruction and learning that positively influence student achievement (Nadelson et al., 2020). Hitt and Tucker's (2016) unified framework (UF) is a researched-based model from synthesized research between 2004 and 2014, and integrates ILPs identified and shown to improve student achievement. Key concepts of the framework are principal instructional leadership and student achievement, which served as the central concepts for exploring and understanding principals' perceptions and application of ILPs and their influence on student Algebra I proficiency. UF constructs related to this study in identifying research-based instructional practices that, when applied consistently, have shown to result in positive student proficiency and achievement. Research has shown that principals' consistent use of UF, a model for principal leadership practices, positively influences student proficiency and achievement. The first step in preparing for interview research, according to Castillo-Montoya (2016), is to ensure interview questions align with research questions of a study. UF was used to ensure interview questions aligned with the research question of the study. For this study, specific developed interview questions focused on one domain of the framework, facilitating high-quality learning experiences. Hence, participant responses provided

appropriate information and addressed the phenomenon of how high school principals' perceptions and ILPs helped improve student proficiency in Algebra I.

Nature of the Study

This basic qualitative research design aimed to examine the perceptions of school principals and ILPs supporting mathematics teachers to help students improve their Algebra I proficiency. A basic qualitative research design was used to collect textual information to understand the study's phenomenon. UF was used to create appropriate interview protocol and purposeful sampling to interview school principals. Qualitative research is the systematic investigation and searches for meanings, opinions, or underlying reasons from subjects that generate textual information (non-numeric) (Power, Velez, Qadafi, & Tennant, 2018). The research question, perceptions of school principals at the high schools under study regarding ILPs supporting mathematics teachers to help students improve their proficiency in Algebra I, was answered with collected and analyzed data from interview responses. The research question for this study required textual data such as participants' responses to open-ended questions to address school principals' perceptions regarding ILPs in support of mathematics teachers to help students improve their Algebra I proficiency. Therefore, a basic qualitative research design was appropriate for this study. Perceptions and ILPs of school principals were fundamental phenomena investigated in this study.

The methodology of this study was a basic qualitative research design. Data was collected from two school principals at high schools using only Zoom recorded

interviews. I manually transcribed recorded audio from interviews using dictation software included on a Mac computer. Member checking was used for participants to review interview transcripts for validation of accuracy. I created interview questions based on instructional leadership. UF frameworks contain characteristics of principals' ILPs that influence increased student achievement: (a) establishing and conveying the vision, (b) facilitating high-quality learning experiences for students, (c) building professional capacity, (d) creating a supportive environment for learning, and (e) connecting with external partners.

Definitions of Key Terms

Algebra: Algebra is "defined as a generalized form of arithmetic that uses symbols, letters, and signs for the purpose of generalization" (Tekin-Sitrava, 2017, p. 299).

Algebra I: Algebra I is a course that provides a foundation in the essential skill, language, and concepts of algebra. Topics included in the course include classification and properties of real numbers, algebraic expressions, linear equations, inequalities, functions, polynomials, factoring, real-world applications, graphing, and the graphing calculator. The course and the state algebra test are required for public school students to graduate from high school (Marghetis, Landy, & Goldstone, 2016).

Instructional leadership practices (ILPs): Instructional leadership practices (ILPs) refers to purposeful educational behaviors and actions by school leaders aimed to

improve teaching and to improve learning for all students (Shaked, Gross, & Glanz, 2017).

Leadership: Leadership refers to the ability to influence others to pursue shared goals (Cruz-Gonzalez, Segovia, & Rodriguez, 2019).

School principal participant: School principal participant is an educator leader employed at one of the high schools sampled in this study who volunteered to contribute the responses (Crowe, Day, & Moller, 2017).

Assumptions

I assumed that the study participants were truthful, honest, and objective in responding to interview questions. Participants were assured in writing of anonymity of identity and confidentiality of their responses to facilitate truthfulness and limit any potential incorrect responses to interview questions. I assumed data collected represented the sample of two participants who were interviewed.

Scope and Delimitations

Delimitations are mainly concerned with elements of a study's sample population, objectives, conceptual framework, and research questions. The scope for this study was delimited to a southern state and one public school district located within the state. The study was delimited to interviews with high school principals. Another delimitation was the ILPs of high school principals. Data collected for this study was delimited to high school principals' responses to answer the research question. Time constraints and data collection were some other delimitations of the study. Interviews were the only source of

data collection for the study; however, in consideration of time constraints and possible time challenges with scheduling interviews with potential participants, interviews were conducted using Zoom.

Limitations

The study had the location limitation of potential participants in one district. The type of data collected was limited to a school district with a B accountability rating. Responses to interview questions were limited to self-reported responses. Self-reported data contain potential sources of bias that could be a limitation. Study results were limited to perceptions of the small sample population of principals to be interviewed. The study was limited to high school principals' perceptions and ILPs supervising mathematics teachers of Algebra I students from public schools during the 2018-2019 school year.

Maintaining honesty and clarity about all aspects of the study were reasonable measures that were used to address any limitations. Taking time with the planning process was a reasonable measure used to address limitations and to ensure the appropriate methodology was selected. Interview questions were designed specifically for participant responses that addressed the study's phenomenon and answered the research question. Two participants volunteered for this study. If only one participant had responded and agreed to interview for the study, one participant would not have been enough to conduct the study.

Interview protocol used to conduct Zoom interviews occurred only with participants who replied "I consent" to the email invitation to participate. Before each interview, I informed participants that if during the interview, they decided to opt-out of this study, any collected data would be destroyed. Each interview was be approximately 60 minutes. After each interview, I informed participants that their interview transcript would be emailed within 24 hours for validation and review.

Significance

The findings may generate new knowledge regarding practices in leadership instruction that may positively influence student proficiency and achievement. School principals may use the findings to apply research-based ILPs that support mathematics teachers' instruction that may lead to increased student proficiency in Algebra I. Principals' leadership practices supporting teachers in delivering instruction to meet all students' needs may improve their proficiency in Algebra I.

School district administrators may use the findings to support high school principals to improve their ILPs for student Algebra I proficiency and achievement. School district administrators may support principals through professional development (PD), given the school district's performance in algebra on state scores, on research-based best instructional practices. The findings of this study could be used by school district administrators to make informed decisions to support principals' ILPs. The findings may help principals to support teachers for students to develop algebraic skills to improve Algebra I proficiency. Potential findings may include strategies for high school

principals to better apply ILPs regarding algebra state scores. Positive social change may occur by principal leaders applying ILPs to help teachers assist students in Algebra I proficiency. Research for this study will add to the body of literature on school principal leadership practices and student proficiency in Algebra I. The study may provide guidance for future research of effective school principal leadership and development of effective leadership practices that promote student proficiency in Algebra I.

Summary

I began the chapter with a brief background into how key stakeholders' concern for the state of education in the United States and a lack of globally being able to compete led to the reauthorization of ESEA. Although reauthorizations of ESEA had some success, some brought much controversy, and many of the nations' students were not able to meet or exceed passing proficiency achievement levels on mandated state tests. ESSA, current reauthorization of ESEA, provisions reinforced the increase in state power by shifting federal authority to states and continues to hold states accountable for progress in education (Hackmann, Malin, & Bragg, 2019). States, given autonomy (within limits), determine and identify how to measure progress (Duff & Wohlstetter, 2019). Saultz, Fusarelli, and McEachin (2017) asserted that states have the flexibility to determine what to include in their accountability system concerning their selected goals and measures. ESSA's Provisions required states to identify indicators for academic achievement, including school quality and student success (Hackmann et al., 2019).

The research problem was that school principals at the high school under study have been inconsistent in applying ILPs supporting mathematics teachers for students to improve their proficiency in Algebra I. The intent of this study was to examine the perceptions of school principals at the high school under study regarding ILPs supporting mathematics teachers to help students to improve their proficiency in Algebra I. Principals' consistent application of leadership practices is essential to promoting student proficiency and achievement (Ganon-Shilon, & Schechter, 2018). Student achievement is the responsibility of principal leaders of schools.

Potential findings of this study may include research-based leadership practices for high school principals to apply, in support of teachers' instruction, to help students increase Algebra I proficiency. Principals' use of findings from this study to apply ILPs to support teachers in improving algebra proficiency may contribute to positive social change in students' Algebra I proficiency, achievement, and algebra state scores.

Rigby, Forman, and Lewis (2019) suggested that principals' consistent application of research-based ILPs to establish environments conducive to student learning may positively influence student achievement. Principals' ILPs should support teachers' professional growth and help teachers build capacity for success by searching deeper in their practice to discover areas they need to improve (Davis & Boudreaux, 2019). Leadership practices of principals who support teachers' reflective thinking and teaching may promote a greater understanding of the fundamentals of effective teaching that leads to improved student achievement (Clará, 2015). Perryman, Ball, Braun, and

Maguire (2017) explained that effective lesson delivery and daily reflection to meet the individual needs of students in every classroom every day is the goal of reflective thinking. Fostering an environment where students feel relaxed and safe is essential in creating a supportive learning environment (Hospel & Galand, 2016). Principals' ILPs to facilitate high-quality learning environments, especially for learners who may have experienced adverse learning environments, gives students the courage to take risks in learning (Clará, 2015). According to Hou et al. (2019), principal leadership practices are influential in reducing disparities in proficiencies and improving student achievement. Boaler and Sengupta-Irving (2016) disclosed that students actively engaged in learning and regularly discussing algebra are apt to learn algebra with more ease and less difficulty and may result in better attainment and sustainment of concepts.

Included in Chapter 2 are a literature search strategy, a conceptual framework, and a literature review of principal leadership and student achievement. In Chapter 3, I included the research design, role of the researcher, instrumentation, a plan for data collection and analysis, and discuss plans for trustworthiness and ethical procedures. Included in Chapter 4 are the setting, data collected, analysis of data, and summary of results. The study's findings, implications of the study, and recommendations for future research are included in Chapter 5.

Chapter 2: Literature Review

I conducted an exhaustive search of prior research and literature reviews in various databases using the keywords principal ILPs, algebra, and student achievement for the background for my study. The search for literature in social shifts, historical events, and political events seems to have been the catalyst for change in schooling in the United States in response to social and political issues and crises. Research and data for my study came from an extensive search of Google Scholar and the Walden Library. After an accumulation of approximately 100 sources, much self-reflection, and a desire to be led and guided by experts in locating and tracking sources, I scheduled two conferences with Walden education librarians. The conferences, first one by phone and a second one by Skype, with the librarians were informative and detailed on focusing searches for desired results and were instrumental in the next and final strategy that I used to locate more relevant research and data for the phenomenon of this study. The next strategy began with constructing of a mind map using critical concepts identified from the research question for my study. The conductions of a broad search to capture as many papers, studies and data as possible consisted of brainstorming synonyms for other possible key concepts other authors may have used in discussing the topic of my research study.

I accessed the following library databases and key terms to search for peer-reviewed literature to have a better and more in-depth understanding of the topic of study: Academic Search Premier, Education Research Complete, Educational Resources Information Center (ERIC), Google Scholar, JSTOR, LexisNexis Academic, and

PsycINFO. I accessed the following search engines to search for literature to have a better and more in-depth understanding of the topic of study: Educational Resources Information Center, Google Scholar, iSeek Education, Lexis Web, Microsoft Academic, and Wolfram Alpha. Key search terms and combinations of search terms used to locate relevant studies, papers, articles, and other sources for this research review of literature for the study were as follows: *leadership; instructional leadership; instructional leadership practices; principal instructional leadership practices; educational leader; leader; high school; principals; algebra; mathematics; state scores; standardized tests; standardized scores; students; high school students; secondary students; student achievement, student performance; student mathematics achievement; learning disability; mathematics learning disability; dyscalculia; teacher leadership; teacher leadership practices; school climate; learning environment; teaching; learning; education best practices; teaching best practices; instructional leadership best practices;* and *leadership best practices.*

Because subject terms are different for databases, a review of specific subject terms for ERIC and Education Sources Combined suggested use of other terms used in their database led to another search of the database with other terms and combinations. Initially, this new search of the same database began broad with entering *leadership* only and returning with 14,814 sources. I entered *secondary schools* next, which returned 1,392 sources. Next, I entered *principals*, which returned 449 sources. I entered *academic achievement* next, which returned 41 sources. I entered *algebra* and *algebra state tests* individually, and both returned no sources. Other databases searched with similar terms

and combinations returned approximately the same results starting with *instructional leadership* (sometimes combined with other desired terms) for a broad search and narrowing down with *algebra* or *state test scores*. The literature search indicated that little (if any) research exists on this topic of this study on principal ILPs and student Algebra I proficiency related to state algebra test scores.

Literature Search Strategy

All searches started broad to locate a gap in the literature to justify the study's phenomenon, and I narrowed results with truncation, wildcards, and Boolean operators. The open Web offers a surplus of information, and Walden Library searches offered more specific searches of scholarly sources. I used Boolean operators to prioritize documents and instruct search engines on how to interpret search requests that contained only specific search terms that I entered. A search of the Walden University Library returned far more focused research because the content being research was only a fraction of the information available on the open Web. In the Walden University Library, I searched only the title and possibly a few words associated with that title, instead of every word inside books and periodicals.

Anticipating a broad search to start a search process: (a) ERIC database was selected, limited by years 2016 to 2020, full text, scholarly peer-reviewed and returned with 7,898 sources; (b) the second term entered, *high school* (to begin the process of narrowing down the search) and returned 1,198 sources; (c) the third term entered, *principal, school* (to continue the process of narrowing down the search) and returned

709 sources; (d) fourth term, *algebra,* entered (farther narrowing down the search) and returned three sources; and the fifth term entered, *algebra state tests,* returned 0 sources—indicating possibly a gap in the literature. Another search process was initiated by repeating the same steps described previously, using the Education Sources Combined database. Another iterative search process of ERIC and the Education Sources Combined initially using a combination of *instructional leadership and high school* returned 203 sources, followed by *principals,* which returned 62 sources. Next, *student achievement* returned 16 sources. Intentional selection and ordering of terms for a broad to narrowing process ended with entering *algebra* and returning with zero sources, further solidifying a possible gap in the literature. Cooper et al. (2018) stated that systematically searching literature is a critical part of systematic review in the research process. The iterative search process described was used repetitively with different databases and a variety of terms and combinations to solidify a possible gap in the literature and to identify relevant scholarly literature to support and to substantiate concepts and information in the study.

Conceptual Framework

The conceptual framework for this study was instructional leadership theory and the unified framework (UF). ILPs and student proficiency were the phenomena for this study. Hitt and Tucker (2016) developed the UF, grounded in instructional leadership theory, from a research synthesis between 2004 and 2014. Hitt and Tucker developed the UF based on principals' consistent ILPs identified and was shown to affect student achievement positively. ILPs are purposeful educational behaviors and actions by school leaders to improve teaching and improve learning for all students (Shaked et al., 2017).

UF was appropriate for this study because the framework was developed in the context of reform perspectives and views of instruction and learning to support principals' instructional leadership and is grounded in instructional leadership theory. Hitt and Tucker identified five characteristics of principals' ILPs shown to increase student achievement: (a) establishing and conveying the vision, (b) facilitating high-quality learning experiences for students, (c) building professional capacity, (d) creating a supportive environment for learning, and (e) connecting with external partners.

UF constructs, a model for principal leadership practices, relates to this study in identifying research-based instructional practices that, when applied consistently, have shown improved student proficiency and achievement. Using one domain of UF, facilitating high-quality learning experiences for students, I used the central question of this study to aid in examining principals' perceptions and ILPs to improve Algebra I proficiency, as determined by state algebra scores. Recommendations for best principal ILPs in support of teachers' daily instructional practices to help students improve Algebra I proficiency could be made based on data that was collected for this study. During the 1950s and 1960s, instructional leadership, one of several leadership theories (Daniels, Hondeghem, & Dochy, 2019), emerged as a practice-related construct and was later transformed during the Effective School Movement in the 1980s into a research-based construct. Edwin Bridges introduced instructional leadership research in 1967 with a study of principals' ILPs (Daniels et al. 2019). Leadership for learning and leader-centered leadership, offshoots of the core construct of instructional leadership, lead to growing interest in principal's instructional leadership in the 1990s and 2000s. Research

from the perspectives of teachers, school superintendents, principals, and parents drew attention to principals as a critical role in effective schools (Hitt & Tucker, 2016).

Literature Review

For over 50 years, scholars have investigated the connection between principal leadership practices and student achievement. Interest in studies investigating the connection between leadership practices and student achievement has increased due to accountability policies (Lee & Lee, 2020). The United States newly adopted reform measures require principal observation and useful feedback to teachers about their instructional practices (Lochmiller, 2016). Students' algebra proficiency and achievement have continued to decline or stagnate for some students in the nation. However, there have been many education reform initiatives (Improving America's School Act of 1994, American Reinvestment and Recovery Act of 2009, Common Core State Standards Initiative of 2009, Achievement Gap Act of 2010, Every Student Succeeds Act of 2015). A large percentage of public school students in the nation have failed to meet proficient score requirements on state tests each year and placed at risk of not graduating (United States Department of Education, 2018). The current number of states requiring high school state tests is the lowest since the mid-1990s (National Center for Educational Statistics, 2019).

Quality education can empower individuals to change their life. Education is the key to success in life, and educators are uniquely positioned to make a lasting influence (positive or negative) on the lives of students (Harris, Jones, Adams, & Cheah, 2018). All

planned and unplanned interactions of educators with students daily are essential and should be purposed with intent to improve student learning and achievement (Hafen, Ruzek, Gregory, Allen, & Mikami, 2015). In America, the view of education is a valuable resource in society and necessary for not only individual growth and stability, but also necessary for economic growth and development (Vemury, Heidrich, Thorpe, & Cros, 2017). Vemury et al. (2017) affirmed that a nation's education determines a nation's brilliance and prosperity level. An educated member of a nation has the potential to contribute more to the nation.

ESSA measures aim to ensure that every student has the opportunity to receive a quality education (Grapin & Benson, 2019). In current years, Day, Gu, and Sammons (2016), Shaked (2018), and Mestry (2017) have found a link between school leadership and student achievement that has brought attention to the topic of principal instructional leadership. The link between school leadership and student achievement has a commonality of principals applying their instructional leadership roles and practices to focus on teaching and learning, emphasizing the consistent application of evidence-based, innovative educational programs, interventions, and practices. In agreement, Bellibas and Liu (2017), Rigby, Forman, and Lewis (2019), and Sussman and Wilson (2019) confirmed that principals' focused actions and behaviors on teaching and learning could ensure students improve their academic proficiency and lead to increased student achievement. Wherefore, as the lead teachers of the school, principals' ILPs are essential to understand in education and, accountability-based requirements have magnified the importance of student achievement.

Critical concepts for this research are instructional leadership and practices, principals and their role as instructional leaders, facilitating a high-quality learning experience for students, and creating a supportive environment for learning. The purpose of this research was to examine the perceptions of school principals at the high schools under study regarding ILPs supporting mathematics teachers to help students improve their proficiency in Algebra I. I include in Chapter 2, specific research strategies used to find relevant and related peer-reviewed literature to the phenomenon of the study. A review of the relevant and related literature to principals' perceptions and ILPs and student achievement make up Chapter 2. I end the chapter with a summary and conclusion of the information presented in the chapter.

Instructional Leadership, Practices, and Student Achievement

Leadership types. Leadership types. Leaders may adopt several approaches to leadership and a variety of leadership styles. Scholars have identified and examined many types of leadership styles in research: authentic leadership (Hirst, Walumbwa, Aryee, Butarbutar, & Chen, 2016), ethical leadership (Kuenzi, Mayer, & Greenbaum, 2019), servant leadership (Crippen & Willows, 2019), and transformational leadership (Hoch, Bommer, Dulebohn, & Wu, 2016). Hoch et al. (2016) viewed transformational leadership as a combination of several other leadership types. Litz and Scott (2017) found that leaders taking on a transformational leadership role in consistently applying educational reforms influence positive student achievement. While from the viewpoint of one leadership style does not fit all, in a phenomenological study, Truong and Hallinger (2017) observed that principal leadership practices integrated combinations of

characteristics from moral leadership and autocratic leadership that resulted in improved student achievement in three schools where principals' applied leadership roles in support of teachers' instructional practices. Similarly, Agasisti, Bowers, and Soncin, (2019) revealed three subgroups of leaders— educative leaders, leaders who teach, and transactional leaders— showed varying levels of student achievement are associated with different leadership styles, and this association was related to particular distributions of principals geographically. Principal leaders may use these findings to make better informed instructional decisions to support teachers' instruction with students' diversity in a classroom.

Davis and Boudreaux (2019) and Cruickshank (2017) revealed that transformational leadership is the preferred leadership style affecting both teaching and learning because transformational leaders' capacity-building perspectives are necessary for effective leadership to influence positive student achievement. Similarly, Kwan (2016) and Vekeman, Devos, and Valcke (2016) found that student achievement is associated with transformational leadership. Principal instructional leaders may use this research-based information on leadership styles to improve and enhance their own ILPs to support teachers' instruction to help students improve their proficiency, leading to improved student achievement.

Public Schools – K-12. Schools are under increased pressure globally and nationally to enact change and transform schools that result in all students graduating career and college ready to be successful. Leithwood, Harris, and Hopkins (2019) found

an empirical link between school leadership and student achievement that has drawn much attention to the topic in current years. In addition to influencing student achievement, Leithwood et al. (2019) and Mestry (2017) agreed that effective principals influence a variety of other school outcomes, recruit and motivate quality teachers, articulate school visions and goals, and allocate resources effectively. Accordingly, Horn, Garner, Kane, and Brasel (2017) suggested that effective principal leaders develop organizational structures to support instruction and learning and support teacher instruction that influences student achievement. Thus, effective principal leaders are essential for effective teacher instruction, student learning, and achievement.

Principal leadership practices to support teachers' instruction help increase Algebra I proficiency in preparing students to meet or exceed passing levels required by state criteria on achievement. Honig and Rainey (2019) stated that schools' overall operations are the principal's responsibility to assume a significant leadership role in making student achievement a significant priority. The results of standardized tests define indicators of student proficiency and achievement in mathematics. Chu (2019) and Dee, Dobbie, Jacob, and Rockoff (2019) agreed that politics dominates accountability and curriculum focused on standardized tests and student achievement in public school education. Some state accountability systems stipulate students should achieve passing or higher level in mathematics as defined by state-established criteria. In addition to continuing to hold states accountable for improving student achievement and education, Malin, Bragg, and Hackmann (2017) affirmed that ESSA includes provisions for college and career readiness (CCR) and ensures each student has a fair and equitable education.

Also, Williams and Welsh (2017) reminded that ESSA provisions require states to identify indicators for academic achievement (including school quality and success), identify schools that need improvement, and identify corrective plans to improve student achievement.

Furthermore, Terosky (2016) affirmed year-to-year accountability and assessment requirements by states have caused the role of the principal in education to evolve from being solely a managerial one to managerial and instructional leader roles. However, Callan (2016) and Smith (2018) found unanswered questions or inadequate responses in education that called into question an equal and fair education. Students have the assurance of quality education by accountability standards. Expectations of educators are to overcome obstacles to ensure students have educational opportunities that enable them to acquire the necessary skills capable of functioning as useful citizens in society.

Principals are the instructional leaders of the school. Shaked et al. (2017) defined *instructional leadership* as purposeful educational behaviors and actions by school leaders aimed to improve teaching and to improve learning for all students. Karadag (2018) defined *leadership* as the ability to directly motivate or inspire an individual or group of people toward achieving a common goal and is necessary to promote student achievement. Similarly, Hitt and Tucker (2016) viewed leadership practices as a collection of behaviors and activities that can improve student achievement. Moreover, AIGhanem, Braganza, and Eldabi (2019) defined *leadership* as a powerful ability that can lead to both positive and negative change and believed educators should purposively lead

and positively influence the next generations. Hence, educators' positions require caution, since actions and behaviors can affect and influence student actions.

Hou et al. (2019) supported educators' interactions and reactions with students that led to lasting impressions and exclaimed those lasting impressions should positively influence and motivate students to work to reach all required academic criteria and desirable goals beyond high school. About principals, Liebowitz and Porter (2019) and Yoon (2016) stated they influence many areas of a school by supporting teachers' direct day to day interactions with students and their classroom actions, especially student achievement. Therefore, principal leaders should be intentional in all actions and behavior within (and outside) of the school setting (Clarke & O' Donoghue, 2016).

A non-exhaustive list of instructional leaders' duties may include establishing clear goals, allocating resources, managing curriculum, monitoring planning of lessons and teaching, and evaluating teachers regularly to ensure student learning and growth. Principals, with adequate preparation, can improve student achievement. Connolly, James, and Fertig (2017) and Davis and Boudreaux (2019) and Leithwood, Sun, and McCullough (2019) found that the use of ILPs leads to improved student achievement. However, Litz and Scott (2017) surveyed practicing principals to examine specific elements of their responsibilities that identified as duties of instructional leaders, and results revealed that principals were ill-prepared for instructional leadership roles in practice. Thus, principals that lack knowledge of effective instructional leadership behaviors and practices may unintentionally negatively affect student achievement.

Personal characteristics, district context, and external contextual factors help shape principals' ILPs that influence student achievement. Agasisti, Bowers, and Soncin (2019) presented leadership contexts that detailed how principals influence student learning that leads to student achievement. Agasisti et al. (2019) investigated relationships of contextual factors, school context, and school principal's characteristics using indicators or frequency of managerial practice applications and perception about the principal's leadership role with student achievement and standardized mathematics and reading test scores. Indicators of this study may be used by principal leaders to enhance their knowledge of research-based practices of contexts factors in support of mathematics teachers' instruction to help students improve their Algebra I proficiency.

Stosich and Bocala (2018), in a narrative case study, examined a principals' instructional practices in facilitating productive team meetings on data conversations. The principal planned to deepen teacher instructional practices and develop teacher use of data in making effective decisions for positive change in student achievement and overall school outcomes. Stosich and Bocala (2018) revealed that the principals' ILPs positively affected student learning and achievement, which was substantiated by the study's data and findings. Findings provided insight into how principals' ILPs can affect teachers' classroom instruction, affecting student learning and achievement. In one of the teacher team meetings, the principal introduced a 6-phase data inquiry cycle for review of assessment to a group of teachers. Principals' instructional leadership in facilitating teacher use of the 6-phase data inquiry cycle helped teachers develop more differentiated plans based on individual student's needs and goals.

ILPs can establish a school environment conducive to student achievement. Park (2018) reported that school principals' ILPs positively influence student learning and achievement. More research is needed on principal leadership and student achievement, especially as it relates to state algebra test scores (Leithwood, et al., 2019). Additional research on principals' ILPs in support of algebra teachers' instructional practices could add to the research practice of leadership and student achievement (Wu et al., 2018). More literature could help ensure students meet or exceed all required goals to graduate high school with a high school diploma successfully.

School principals are responsible for student achievement, so school reforms have been applied over the last two decades to increase student achievement, especially for some socioeconomically disadvantaged students like Hispanics and students of color. Garcia and Weiss (2017) suggested that historically, there has been an achievement gap between advantaged and disadvantaged students. Park (2018) and Park and Datnow (2017) reported that the school principal's ILPs are critical to school outcomes, namely the academic success of student learning and achievement. Hence, principal ILPs should establish a school environment conducive to learning that guides and directs all students in academic proficiency and achievement. Although a large body of knowledge exists on instructional practices and student achievement generally concerning teachers (Wu et al., 2018), there is a need for more research on specific principal instructional practices that influence student achievement.

Principals and their Roles as Instructional Leaders

Accountability and assessment initiatives have caused the principals' role in education to evolve from being solely a managerial one to a dual managerial and instructional leader role (Thessin & Louis, 2019). Mestry (2017) emphasized the importance of school principals accentuating their roles as instructional leaders by consistently keeping their schools focused on meeting student needs, best teaching practices, and meeting curriculum goals for successful student achievement. Mestry (2017) investigated eight school principals' perceptions and experiences as instructional leaders using an open-ended questionnaire initially and followed up with semi structured interviews. Before conducting in-depth individual interviews, Mestry (2017) reviewed each principal's questionnaire responses to probe further and supplement responses. Data collected from interviews revealed three themes: (a) concept of instructional leadership clear to principals, (b) instructional leadership role of principals, and c) PD programs for principals. Few principals provided a complete interpretation of the concept of instructional leadership. Many principals only supplied a limited or partial understanding of the concept of instructional leadership. Some principals did not view instructional leadership as one of their primary functions or responsibilities and had not attended a structured PD program on curricular matters. The focus of all PD is to provide information to improve or enhance instruction practices with research-based practices shown to improve student learning and achievement (Kennedy, 2016). Principal leaders are also learners.

Principals are instructional leaders, coaches, team builders, and visionary agents of change. Tingle, Corrales, and Peters (2017) stated that states are accountable for student achievement, and principals are responsible for their schools' outcomes. As a result, ILPs of principals should support teacher instructional practices and behaviors that lead to improved student proficiency and achievement (Keller, Neumann, & Fischer, 2017). Tingle et al. (2017) stated that principals should be cognizant of how their actions and behaviors promote teaching, learning, and student achievement. By implementing research-based leadership practices to positively influence student achievement, principals can serve as role models for teachers' expected use of research-based instruction to improve student proficiency and achievement (van Geel, Keuning, Visscher, & Fox, 2019). Hughes and Lee (2019) maintained principals and their role as instructional leaders connect to teachers, students, and leads back to student achievement and success. Principal ILPs help shape student achievement.

Day et al. (2016), in a mixed-methods study on the influence of principal leadership on student achievement, added that scholars support the view no one approach to leadership will be sufficient for improving student achievement. Day et al. (2016) provided new empirical evidence of how successful principals, directly and indirectly, achieve and sustain improvement over time by combining transformational and instructional leadership strategies and understand school needs. Gumus, Bellibas, Esen, and Gumus (2018) reviewed related literature on instructional leadership, transformational leadership, and distributed leadership. Gumus et al. (2018) focused on the effects of principal leaders' practices on student achievement. Likewise, Hallinger,

Gümüs, and Bellibas (2020) suggested a systematic review of leadership research published between 1940 and 2018, and instructional leadership found in conjunction with other leadership styles improved student achievement. Principal leader's styles of leadership and ILPs influence student achievement.

Principals' Visible Learning. Knight (2019) studied principals' instructional support of teachers' application of visible learning (VL) through instructional coaching, specifically for translating research-based practices into effective classroom instructional practices. Instructional coaching involves coaching strategies targeted explicitly at building teacher capacity for effective instruction focused on positive influences on student achievement (Connor, 2017). VL is a program that focuses on the influence of teacher practices and instruction on student learning through various evidence-based practices (Bergeron & Rivard, 2017). Principals could support teachers and use VL to build teacher professional capacity to help teachers advance their instructional practices and improve students' Algebra I proficiency and achievement. Similarly, demonstrating the importance of principal instructional leaders supporting teachers, Al-Abdullatif, Alsaeed, and Wang (2019) examined mathematics teachers' VL practices and revealed mathematics teachers' application of VL practices were effective because student achievement improved based on test scores. Hence, principals' deliberate use of instructional coaches and VL to support teachers' classroom practices to create a culture of evidence-based teaching practices could increase student academic proficiency and achievement.

Principals' evidence-based decisions. Principal instructional leaders' evidence-based decisions about relevant PD for teachers ensures adequate training and information for teachers to help students improve proficiency and achieve academic success. In selecting appropriate and relevant PD for teachers, Bowe and Gore (2017) and Girvan, Conneely, and Tangney (2016) recommended that principals should use information collected from observations and research-based practices shown to increase student achievement. Evidence-based decisions about PD for teachers ensures adequate training and information for teachers to help students increase academic achievement. Horn, Garner, Kane, and Brasel (2017) and Vangrieken, Meredith, Packer, and Kyndt (2017), proclaimed an increase in relevant PD focusing on teachers working on collaborative initiatives to share information and expertise might lead to increased student achievement. For that reason, Girvan et al. (2016) specified effective PD might help teachers stay current in instructional practices and topics to ensure the selection and delivery of effective instruction shown to improve student achievement. Futhermore, Kyndt, Gijbels, Grosemans, and Donche (2016) affirmed that when educators join and share expertise and ideas with focused goals of improving instructional practices, the result may be increased student learning and improved student achievement. Hence, principals' ILPs support teachers working together and sharing ideas that promote a positive learning environment for increased student achievement.

Evidence-based practices by principal leaders to support teacher instruction may improve student Algebra I proficiency. Chitpin (2019) and Tractenberg, FitzGerald, and Collmann (2017) believed a regular review of principals' leadership practices should

occur to determine success or failure of application as measured by student achievement. Likewise, Litz and Scott (2017) supported the idea that principals should lead their schools in collaboration and shared decision making based on research-informed practices that show support of specific teacher instructional practices that influence positive student achievement. Through their instructional practices, Litz and Scott (2017) and Tractenberg et al. (2017) reported that principals could enable teachers to improve student achievement and principals' ILPs should ensure ongoing professional development and monitoring of teacher application of effective instructional practices to meet individual student's needs to ensure student achievement. For example, principals monitoring teachers' instruction and the practices being evaluated and reflected upon to determine the level of student learning and proficiency is useful for ensuring effective teacher instructional practices. Likewise, Chitpin (2019) stipulated principals' research-informed decisions about instructional practices should be shared with teachers individually and collectively in oral and written form to continue building a high-quality learning experience for student learning and achievement. Thus, principal leaders ensure teachers' are provided with opportunities to develop or enhance high-quality instruction practices.

Principals' practices and student achievement. Self-esteem and self-efficacy are essential for principal leaders to use as an ILP to encourage and support teachers' instruction to improve student achievement. Building a student's self-esteem and self-efficacy in the classroom reflects confidence, so Öqvist and Malmstrom (2017) suggested principals should encourage teachers to ensure students experience success on the first

day of class to start out positive, especially for students who may have unfavorable experiences in the past. Öqvist and Malmstrom (2017) inferred students' determination and belief that they can achieve their goals are essential factors in their persistence in ongoing learning and in maintaining and sustaining a supportive learning environment. Principals' ILPs to support teachers' instructional practices to ensure students start to experience early success may motive students to want to continue to learn to attain and sustain success.

Adolescents and young adults can often take longer in the learning process because of various learning barriers, but this does not mean they are not motivated to learn. Alan and Ertac (2018) and Fuhrmann (2018) stressed that principal leaders utilize patience and motivation as elements of ILPs to encourage and support teachers' instructional practices to improve student proficiency and achievement. Noncognitive skills of patience and motivation help principals and teachers nurture learning for students. Thereupon, Fuhrmann (2018) and Wright, Bergom, and Bartholomew (2019) attested that the level of motivation students bring to the learning environment will be transformed by what happens in the learning process. Thus, Alan and Ertac (2018) affirmed that students demonstrate higher student achievement with more persuasive noncognitive skills.

Relevance is necessary to engage some students to learn and achieve. Principal instructional leaders support teachers' instruction to make learning relevant to students to engage in learning. Soysal (2019) expressed principal instructional leaders, support

teachers' instruction to incorporate relevancy in the delivery of instruction to help students realize how useful knowledge can be in their interests. Similiarly, Mahler, Großschedl, and Harms (2018) pointed out principals' practices in support of teachers' instruction that use students' interests and strengths to influence curiosity to engage students to learn aids in improving student proficiency. Mahler et al. (2018) acknowledged that principals focused on teaching and learning encourage teachers to seek ways to awaken students' knowledge and interest in engaging in active learning to lead to student achievement. For example, principal practices may support teachers' instruction to vary teaching methods and provide options for students to choose methods for learning new concepts.

Principal communication can make the instruction and learning process more manageable. Soysal (2019) and Topu and Goktas (2018) agreed nonverbal communication cues used by principals are essential elements in the instructional process that create supportive learning environments for teacher and student interactions and reinforcement of instructional practices. Therefore, principals' ILPs are essential for creating supportive environments for learning and support teachers' use of nonverbal communication signals with students that reinforce learning. For example, areas of nonverbal practices for principal instructional leaders to examine are eye contact, gestures, body orientation and posture, distance, paralinguistics, and humor (Hansen-Thomas & Langman, 2017). Sutiyatno (2018) professed principal leaders could utilize eye contact to open communication by conveying warmth, concern, and credibility. Also,

Sutiyatno (2018) indicated that facial expressions, such as smiling, are an excellent way for principals to communicate friendliness and warmth to teachers and students.

Human emotions, such as anxiety, laughter, and humor, can affect the psychological processes of student learning and achievement. Principals' humor, Ngussa and Mbuti (2017) and Van Praag, Stevens, and Van Houtte (2017) agreed could be used effectively as a teaching tool to model appropriate instructional strategies for teachers' instructional practices to use to meet all student needs. Ngussa and Mbuti (2017) and Van Praag et al. (2017) advocated that principals being intentional with modeling humor with the application of practices could reassure teachers it is okay to laugh in the classroom and to encourage students to laugh in the classroom. Hence, humor can be an outlet to release tension and stress for principals, teachers, and students. For example, principal leaders may use human emotions to enhance teaching and learning purposively to promote student proficiency and, in turn, student achievement.

Principals' practices and interactions with teachers and students. Principals should be cognizant of the importance of appropriate distance when interacting and communicating with teachers and students. In the necessity of school safety and climate, Nguyen, Yuan, and McNeeley (2020) and Van Vraag et al. (2017) advocated principal school leaders should consider school safety and climate in the school vision because they believed it necessary to support the academic achievement of each student. Pennings and Hollenstein (2019) noted students reported that they learn less and lose interest more quickly when listening to principals and teachers who have not learned to modulate their

voices. Thus, principal ILPs can be essential in opening up interactions and communications to initiate the help students need to improve proficiency and ultimately achieve academic success.

Principals ensure the safety of teachers and students while on school property. In the necessity of school safety and climate, Nguyen, Yuan, and McNeeley (2020) and Van Vraag et al. (2017) advocated principal school leaders should consider school safety and climate in the school vision because they believed it necessary to support the academic achievement of each student. For example, the use and sale of illegal drugs, exposure to violence or weapons, and victimization with threats, theft, and bullying on school grounds could interfere and change the dynamics of teaching and learning. In conclusion, principal instructional leaders' intentional actions with safety and orderly learning environments promote the protection of teachers and students from activities and behaviors that have the potential to impede the learning and teaching process. Safe and orderly schools provide students with an opportunity to learn.

Establishing and conveying the vision. Principals lead by example as visionary leaders establishing and conveying a shared vision for their school. Principal leaders who articulate a plan of action for working collectively with school staff, students, and stakeholders to establish and carry out a strong vision and belief system, Gibbons, Wilhelm, and Cobb (2019), Hitt and Tucker (2016), and (Silva, 2016) affirmed promotes actions for positive student and school outcomes. Furthermore, the successful application of plans to move a school forward in improving student achievement show principals to

be leaders for change. Thus, Shepherd and Yeon (2019) stated self-reflection is required for principals to align leadership skills and practices to academically, culturally, and economically diverse groups of students to produce opportunities to meet individual challenges of students to produce positive achievement. For example, principals' intentional actions to empower teachers with best practices through PD sessions focused on diverse groups of students can positively change academic proficiency and outcomes for students.

In support of instructional leadership as a critical element in improving student proficiency and achievement, Gibbons et al. (2019) and Shepherd and Yeon (2019) supported principal leadership practices focused on observations of teachers' instruction in classrooms and improving teacher instruction. Gibbons et al. (2019) and Shepherd and Yeon (2019) revealed principals' support of teachers, through observation of instructional practices followed by feedback collaborations with teachers, enhanced capacity for teachers' instructional practices that in turn promote high-quality instruction and improved student achievement. Consequently, principals' observation of teachers' research-based instructional practices, results in high-quality learning experiences for students that promoted academic proficiency and sustained learning for continued growth and lasting academic success. Confidence levels of principals' instructional leadership roles and practices may result in the consistent application of a research-based instructional leadership model that increases effective teaching, which leads to improved student learning, proficiency, and achievement.

Facilitating a High-Quality Learning Experience for Students

Principals, as instructional leaders, play a significant role in the delivery of quality instruction and are expected to ensure teachers and students receive materials they need to achieve. In consideration of educators challenged with meeting individual student needs, Osakwe (2016) advocated that principals' ILPs support teachers in tailoring instruction to individual students' needs in preparation of student proficiency and success in meeting all required educational goals. Knowledgeable of the necessity of quality instruction to improve student achievement, Osakwe (2016) and Shaked (2020) recommended principals build teacher capacity with research-based PD on differentiated instruction development to enhance knowledge of the delivery of effective instruction to meet individual student needs. Shaked (2020) stated motivated principals leaders, focused on instruction and learning, create positive learning climates that motivate teachers, students, and other school staff. Thus, to create high-quality learning experiences for students, principal leaders focus on instruction and learning and seek opportunities to support teacher instruction to help create and facilitate positive learning environments. Thus, high-quality learning environments allow students the opportunity to work effectively, learn, and achieve.

As instructional leaders, principals should know their teachers and students and be knowledgeable of effective instructional strategies for improving student proficiency and achievement. Recognizing the necessity of effective teacher and student classroom interactions for improving student achievement, Carbonneau, Van Orman, Lemberger-Truelove, and Atencio (2019) and Cooper et al. (2019) revealed principals' continued

focus on maintaining instructional environments conducive to learning and using numerous methods to support teacher instruction while encouraging students resulted in increased student achievement. For example, a principal supported the teachers' plans to address the needs of struggling students by creating alternative centers in classrooms for students to earn additional needed credits for graduation. Principal practices to support teacher-student relationships with high-quality instruction and learning experiences can promote student achievement.

Some students struggle with attaining and sustaining basic mathematic facts and computations. Principal leaders knowledgeable of mathematics disorders like dyscalculia may support teachers' professional capacity for planning and delivering instruction to meet the needs of struggling mathematics students. Haberstroh and Schulte-Korne (2019) and Träff, Olsson, Östergren, and Skagerlund (2017) revealed that students with dyscalculia, a learning disability that affects an individual's ability to complete necessary arithmetic procedures, are susceptible to making more mistakes with calculations and computations and often take longer with number manipulation. According to Haberstroh and Schulte-Korne (2019), 3-7% of students have dyscalculia, and students with mathematics challenges show impairment in schoolwork and everyday life and have persistent difficulty performing arithmetical calculations and are at increased risk of developing mental disorders. Knowledgeable principals of mathematics disabilities can ensure teachers also are knowledgeable by facilitating and creating relevant PD opportunities focused on dyscalculia to help teachers better plan and deliver instruction to meet all students' needs. Principal leadership practice in support of teacher instructional

practices to meet all students' needs ensures the support of students with dyscalculia in their learning. Working with struggling mathematics students can be a challenge; however, all educators must meet each student where they are and improve proficiency.

Rababah and Alghazo (2016) conducted a quantitative experimental study of dyscalculia using three elementary schools, randomly selected from 20 elementary schools. The experimental study consisted of two randomly selected groups, the treatment and control groups. Treatment was the Diagnostic Assessment Program. The treatment group (Group A) consisted of 26 students from two different schools diagnosed with dyscalculia, and the control group (Group B) consisted of 15 students from one school, and all students in this group also had dyscalculia. Teachers for control group classrooms received no specific training. However, resource room teachers in the school assigned as the treatment groups underwent two weeks of training to apply a diagnostic assessment strategy.

A diagnostic assessment strategy is a plan of action or policy to enhance student achievement in a specific subject area, such as mathematics (Graven & Venkat, 2019). Rababah and Alghazo (2016) designed a 40-item Diagnostic Assessment of Basic Mathematics Skills (DABMS) from a thorough analysis of the selected schools' current curriculum, other tests, and standardized international assessments of basic mathematical skills. Rababah and Alghazo (2016) used a panel of five university professors and two teachers to validate the DABMS, administered as a pretest and posttest to all groups. Analysis from the data revealed no statistically significant differences in student scores

on the pretest between the control group and either of the treatment groups. Analysis from the data revealed no statistically significant difference between the control groups on the pretest, suggesting all three groups of students had similar levels of mathematical abilities and understanding. However, analysis of posttest data revealed a statistically significant difference in scores between the control group, where students were in classes and received regular instructions. Principals, as instructional leaders, may use results of this study as a guide for some research-based Algebra I intervention strategy to support teachers' instruction to facilitate a high-quality learning experience to meet the needs of students to improve Algebra I proficiency. Practical application of the strategy may improve student learning, especially students with learning disabilities in mathematics, which may improve student achievement and state algebra test scores.

Understanding when particular teaching strategies are appropriate was identified by Eshuis et al. (2019) and Winingsih and Sulistiono (2020) as a practice of effective principals regardless of identified students for supports through 504 plans, Individualized Educational Plans, RtI, or state test results. Akiba, Murata, Howard, and Wilkinson (2018) and Eshuis et al. (2019) acknowledged effective principals' collaboration and use of empirical research and shared best practices as viable tools for improving teaching and learning. For example, principal leaders may ensure specific groups of teachers have designated times to specifically collaborate and plan strategies and instructional practices for specific content and specific ability levels for students. Thus, Carbonneau et al. (2019) noted principals, as instructional leaders, support teachers' application of newly discovered and learned instructional techniques and strategies by combining them with

current instructional practices. Thus, principals support teachers' instruction by acknowledging that teachers tweak current instructional practices and strategies with necessary new strategies to accommodate diverse student populations from class-to-class, year-to-year, and individual student-to-individual students.

Principals should review student data regularly to determine if improvements in instruction and learning have occurred. Van Geel, Keuning, Vissher, and Fox, J. (2016) recommended principals systematically utilize student achievement data to make informed decisions to support teachers with individualizing instruction based on students' needs that may lead to improved student proficiency. Likewise, Bartz (2017) suggested principals use data to support teachers in prioritizing classroom instruction and in determining specific topics to help students who may be struggling. Furthermore, Geel et al. (2016) indicated that principals might find the use of data an appropriate source to determine the effectiveness of teacher lessons in helping students improve their proficiency and help teachers identify individual instructional interventions for students. Hence, principals' use of evidence-based practices of data use for instructional decisions may improve teacher instruction and student learning that leads to improved student proficiency and achievement.

*Evidence to Strength Quality of Instructio*nolby (2017) examined PD to engage principals instructional leaders to evaluate their ability to identify components of high-quality mathematical practices and instructional practices specific to algebra. Boston et al. (2017) used analyses of classroom videos and pretask and posttask sorts in the PD session to help principals identify high-quality mathematical practices. Results of Boston

et al. (2017) study revealed significant differences that occurred when principals identified high-quality mathematics instruction and practices and teacher practices. Boston et al. (2017) study could be used by principal instructional leaders as a guide to support teachers in establishing best mathematical practices or to establish high-quality instructional practices that lead to quality learning for students and improved Algebra I proficiency. For example, principals could facilitate or provide teachers with PD opportunities to build capacity in similar PD sessions that allow teachers to view and evaluate classroom videos for high-quality instructional practices and student thinking and learning.

Kelley, Knowles, Han, and Sung (2019) described the development of a 21st-century skills instrument for high school students. Students participated in the NSF 1-Test project called Teachers and Researchers Advancing Integrated Lessons in STEM (TRAILS). With TRAILS, Kelley et al. (2019) intended to improve students' learning in science, technology, engineering, and mathematics (STEM) content and encourage students' interest in STEM careers. During the first round of development, Kelley et al. (2019) used four rubrics designed to assess project-based learning activities for collaboration, communication, creativity, and critical thinking. Through an online survey system, 55 high school students were administered the 21st-century skills instrument pilot test from the TRIALS program. Using language from P21 standard documents and adding more items, the team revised the instrument. Participants in the high school stem program, 276 students, were administered the 50-item revised 21st-century skills instrument. With durable internal consistency from the final exploratory analysis factor,

Kelley et al. (2019) loaded the 30 survey items across four subscales. Principal instructional leaders could support teachers' planning and delivery of instruction for the 30-item survey as a baseline to measure the achievement of 21st-century skills and to measure algebra proficiency.

Kelley et al. (2019) stated that high expectations are common traits of high achieving students. Kelley et al. (2019) also supported the idea that principals facilitating a high-quality learning experience for students involves facilitation of the 4 C's of 21st-century skills: critical thinking, creativity, collaboration, and communication. Likewise, Park, Lee, and Cooc (2019) stated that high expectations are common among high-performing and high-achieving students. Lee and Cooc (2019) believed principal leadership practices of high expectations for student achievement through the support of educational policy mandates of shifts from memorization and rote learning to 21st-century skills to prepare students to succeed in the school and workplace. Autor (2016) reported that automation might replace half the jobs in the United States economy. The question many have voiced an opinion on is what are the future jobs (Zhang, 2019), while others question what skills students need for jobs of the future (Autor (2016). A significant question for educators is how educators prepare students now for jobs of the future (Zhang, 2019). Principal leaders of the 21st-century support teacher instruction of skills in the 21st-century.

La Velle (2020) advocated K-12 principal leaders support teachers' instructional practices and instruction delivery to model, develop, and assess 21st-century skills.

Huang and Rust (2018) stated institutions and policies determined the growth of automation and artificial intelligence (AI), machines simulated with human intelligence programmed to mimic human actions and to think like humans (Ionescu, 2019). Principal leaders' knowledge of AI embedded in algebra could support teachers in delivering instruction relevant to students' current and future needs and interests that may motivate and inspire students to take ownership of their learning. For example, principals creating PD opportunities for teacher instruction that use the connection of AI to concepts in algebra may inspire struggling students to persevere and learn more in-depth, which may lead to improved Algebra I proficiency and student achievement.

Building professional capacity. Capacity building is a participatory method that refers to practices to improve educator abilities and expertise. Datnow and Hubbard (2016) and Lynch, Smith, Provost, and Madden (2016) believed principal leadership practices should include data-driven decisions and research-based decisions to build teacher capacity and improve instruction that will have positive consequences on student achievement. Similarly, Kearney and Garfield (2019) and Medina, Mansor, Wahab, and Vikaraman (2019) believed that principal instructional leaders should continuously support practices of teacher development and growth to meet student goals of increased proficiency and achievement collectively. Additionally, Kearney and Garfield (2019) and Medina, Mansor, Wahab, and Vikaraman (2019) believed that a culture of shared learning results from building capacity that enhances teachers' instruction, which in turn enhances student learning. Therefore, principals creating collaborative opportunities for

teachers to use significant resources to improve teaching and learning promote increased instructional capacity.

Principals' support of teachers' delivery of quality instruction is necessary for student learning and achievement. Seghal et al. (2017) indicated that principal leaders should include collaboration with teachers to improve instruction delivery, teacher-student interactions, and adjust learning to meet individual student needs. Likewise, Siciliano (2016) agreed that principals working collectively with teachers to build professional capacity for effective instructional practices to meet individual students need to lead to teacher effectiveness of instruction leads to increased student achievement. Thereupon, principal instructional leaders' ability and success in building instruction capacity is crucial for improving student proficiency.

Lynch et al. (2016) studied the role of principal leaders' data interpretation to guide decisions in instructional practices. A district organizational reform model of effective instruction was devised, based on evidence-based effective instruction, by the principal school leader and leadership team to improve student academic achievement. According to Lynch et al. (2016), schools with influential principal instructional leaders focused on instruction and learning can support teachers to help students improve their proficiency and achievement. With a variety of quantitative parametric statistics, Lynch et al. (2016) used a variety of non-standardized and standardized tests from selected classrooms to compare student achievement. Lynch et al. (2016) found that data interpretation by the principal and their collaboration with teachers on data interpretation

was vital in building teacher capacity in data used to improve student achievement. Furthermore, Lynch et al. (2016) revealed that student achievement was positively influenced by principal leaders, with student learning as a top priority, consistently applying instructional practices to support teacher instruction capacity. Principals leaders may use findings from this study to enhance their instructional practices to build capacity in support of teachers' data-informed decisions of instructional practices to help students improve their proficiency in Algebra I.

Bawaneh, Moumene, and Aldalalah (2020) and Mathew, Mathew, Prince, and Peechattu (2017) supported the idea that principals' ILPs of reflective practice help them gather meaning from experiences, and they use the knowledge to make better decisions on instruction and teaching. Additionally, Mathew et al. (2017) revealed that principals' instructional leadership support of teacher's instructional planning and instructional delivery are strengthened with the development of teacher self-reflective abilities and helps improve student achievement. Thus, principals' consistent application of ILPs in support of teachers' reflective practice of instruction promotes effective instruction.

Creating a Supportive Environment of Learning

Students spend a significant amount of time in school classrooms each year. As instructional leaders, Shamina and Mumthas (2018) believed principals' practice of supporting teachers in their enforcement of classroom expectations ensures students have the necessary environment to meet all required academic achievements. Furthermore, Shamina and Mumthas (2018) reported that the promotion of student participation and

engagement results when principals support teachers' classroom practices so that students take ownership of their learning. For that reason, Sedova et al. (2019) affirmed that student empowerment to thrive is encourage through consistent learning environments that provide time and space to focus on academic material. In conclusion, Blömeke and Olsen (2019) stated that consistency is critical to principals creating environments conducive for effective learning that positively influence student achievement.

According to Coburn, Hill, and Spillane (2016), the prominent display of exemplary leadership behavior establishes the tone for schools and initiates actions to create a supportive environment for learning and student achievement. Skaalvik (2020) advocated that principals ILPs to apply school-wide reform and develop and support high-quality instruction are necessary to promote student achievement. Principal ILPs support teachers' instruction to help students improve their Algebra I proficiency, promote an environment where students feel relaxed and safe, and is vital in creating a supportive learning environment (Hospel & Galand, 2016). Such an environment, especially for learners who may have experienced adverse learning environments, gives students the courage and a will to take risks in learning. Regarding a safe classroom environment, Skaalvik (2020) explained that students could trust their teachers to care about what they have to say and will respond respectfully to their responses. Also, Osterberg, Goldstein, Hatem, Moynahan, and Shochet (2016) and Skaalvik (2020) suggested that students develop friendships to support social and academic elements from supportive classrooms and learning environments that display a sense and feeling of home and family. Thus, principals leaders can encourage and support teachers in ways to

create a supportive environment for learning by building a strong classroom community because teacher-designed classrooms of learning communities lead to improved student proficiency and academic achievement.

Jacobs, Boardman, Potvin, and Wang (2017) noted that principals' ILPs to support teachers' instruction and activities to build healthy classroom communities promote initiatives to create supportive and meaningful relationships between students that motivate them to achieve. Furthermore, Jacobs et al. (2017) asserted principal ILPs in support of teachers' actions to build their classrooms to provide students with friendships, contacts, and skills beyond their community help create supportive environments for learning that influence student achievement. To start the process of building community, Liou, Martinez, and Rotheram-Fuller (2016) and Oberle (2018) suggested principal leaders should encourage and support teachers starting the first day of class helping students get acquainted. Liou et al. (2016) and Oberle (2018) believed principal instructional leadership plans might include actions throughout the year to present opportunities for teachers and students to form relationships continuously.

To engage active student participation rather than passive, principal leadership practices should encourage and support teachers' use of instructional activities involving designing, creating, writing, and solving. Alan and Ertac (2018) and Topu and Goktas (2018) reciprocated principals' support of teacher instruction that integrates guided and explorative self-learning into instruction that allows students to learn more in-depth when educators accept and respect students for their values even if they differ from principals

and teachers. Thus, through demonstrations of belief and support of their teachers' instruction, principal leaders motivate students to believe in themselves and create a supportive environment. Principals' support of teachers' instructional practices designed to build classroom relationships in conjunction with learning may include pair-work, small-group, and whole-class activities.

Connecting with external partners. Principals, teachers, parents, school staff, and community, and community leaders are necessary to ensure students learn and achieve. Webb and Engar (2016) revealed a link between student achievement and collaborative efforts of schools, parents, family, and community to involve external partners. Moreover, Fuhrmann (2018) prompted principals' ILPs to develop closer, more productive, and deeper partnerships with external partners that could enhance student learning and motivate students to learn more in-depth. Hence, principal instructional leaders connecting with external partners could motivate students and present them with additional opportunities, enrichments, and supports that help students prepare for a career, college, and citizenship.

When students' parents are actively involved in their education, Blau and Hameiri (2017) advised that students have the knowledge and willpower to learn and complete assignments. So, Ghani, Pourrajab, Roustaee, Talebloo, and Kasmaienzhadfard (2017) exclaimed the extent to which parents encourage learning at home and engage in their children's education are the best determinants of student achievement. Furthermore, Ghani et al. (2017) stated that principal instructional leadership that ensures a positive

and safe learning environment with parental involvement supports teachers in helping students learn and promote opportunities for students to learn and achieve. Parents know and have information about students that principals and teachers may not always have. Therefore, Blau and Hameiri (2017) replied that principals and parents must work together to enrich and enhance students' learning experiences that lead to better student achievement. Every student in a school has a parent and comes from a community. Hence, principal leaders' intentional actions to engage parents and community in support of student learning benefits students, parents, and the community.

Principals need to collaborate with communities for partnerships for strategies to support schools in meeting student achievement. Strong schools make strong communities, and according to Bellows (2019) credited four principal leadership practices are credited for promoting strong community partnerships that help improve student achievement: (a) strong school leadership, (b) an inviting school environment, (c) teachers committed to student achievement, and (d) communication and collaboration among community partners. Because principal leaders do not work in isolation, Davis and Boudreaux (2019) professed they need input from all stakeholders to address and devise a practical plan for improving student achievement. Wherefore, Coburn and Penuel (2016) disclosed that principals understand the importance of empowering other stakeholders in respective areas, especially communities and businesses, to help ensure students achieve academic success. Thus, principals' ILPs that involve working with external partners to motivate and make skills and concepts more relevant to students will

help promote and increase abilities to learn and support the goals of students' proficiency and achievement.

Concepts of interest in this study are principals' ILPs and student proficiency, which leads to student achievement. Principal ILPs, to support teachers' instructional practices to increase their proficiency, have been shown to have positive influences on student achievement (Grissom et al., 2015). Qualitative methodology and methods are consistent with this study's scope, and basic qualitative research is the chosen methodology for the study. The following qualitative studies have identified constructs of principals' ILPs and student achievement: (Kalman & Arslan, 2016; Oyeniran & Anchomese, 2018; Preston, Claypool, & Rowluck, 2017).

Brown (2016) examined how a principal, with 15 years of leadership in a high performing diverse school, implemented leadership practices in support of teachers. Brown (2016) collected and analyzed data that revealed eight leadership practices that supported teacher instruction to help students learn and improve their proficiency. The eight practices duplicated across other school sites were (a) the development of common assessments, (b) aligning curriculum to standards, (c) developing common assessments, (d) forming professional learning communities, (e) mandating data-driven instruction efforts, (f) facilitating parent-teacher organization, (g) allowing a schedule of uninterrupted instruction, and (h) implementing a behavior program. Principal instructional leaders may use these instructional practices in support of teachings'

instruction to individualize instruction to meet the needs of students to improve their Algebra I proficiency.

Kalman and Arslan (2016) conducted a qualitative case study to examine primary and middle school principal's self-evaluation of ILPs. Kalman and Arslan (2016) conducted a qualitative case study to examine primary and middle school principal's self-evaluation of ILPs. Kalman and Arslan (2016) conducted the study with 11 primary and middle school principals, which indicated that some of the principals employed great care and thoroughness to improve school-related factors to increase student achievement. However, the principals were unsuccessful in demonstrating ILPs such as promoting teachers' professional growth, managing change, collaborating with teachers, and establishing positive learning environments conducive to learning and achieving. Implications for the study included recommendations for developing principals as effective instructional leaders. Kalman and Arslan's (2016) findings could contribute knowledge of how principals apply ILPs to support teachers and improve student Algebra I proficiency. Similarily, Oyeniran and Anchomese (2018) analyzed five women principals' leadership practices and contributions to the advancement of their schools, specifically when faced with challenging situations that hindered their ways of leading. The study's findings showed that the female principal indirectly influenced students' learning process, especially students with difficulties learning, while the principals directly influenced teachers' commitment.

Researchers in the discipline have approached the problem of this study in many ways. Some researchers in the discipline have approached the problem of student achievement by exploring principals' leadership practices and behaviors implemented to support teachers' instruction (Crippen & Willows, 2019). Some researchers have studied how different leadership types influence student achievement (Hirst, Walumbwa, Aryee, Butarbutar, & Chen, 2016; Kuenzi et al., 2019; Litz & Scott, 2017; Truong & Hallinger, 2017). Other researchers have studied specific school contextual factors like how school climate may influence student achievement (Agasisti, Bowers, & Soncin, 2019; Clarke & O'Donoghue, 2016; Hallinger, 2016). Some researchers have also studied teacher instructional practices concerning student achievement (Dudek, Reddy, & Lekwa, 2019; Gess-Newsome et al., 2019; Lekwa, Reddy, & Shernoff, 2018) solely.

In one similar study related to the research question, Naidoo (2019) replied that principals could develop exemplary ILPs if they have access to appropriate and relevant PD. The approach Naidoo (2019) used will serve as one of the guides I use in the collection and analysis of data for this study. Another study related to this study's research question, Bellibas and Liu (2017), examined a gap in research practice on how principals effectively apply behaviors and practices to shape culture conducive to learning. Concepts of Bellibas and Liu's (2017) study are similar and related to this study and will serve as another guide I use for this study.

Justification from the literature was the basis for the rationale for selecting the constructs on instructional leadership concepts. Hitt and Tucker's (2016) unified

framework (UF) is a researched-based model from synthesized research between 2004 and 2014 and integrated ILPs. UF identifies five characteristics of principal ILPs that influence increased student achievement: (a) establishing and conveying the vision, (b) facilitating high-quality learning experiences for students, (c) building professional capacity, (d) creating a supportive environment for learning, and (e) connecting with external partners. The problem and purpose of this research focus on the phenomenon of instructional leadership and student achievement, which are also the focus of UF. Therefore, the five continuums that make-up UF is appropriate to use in selecting concepts and basic qualitative research design methodology for this study.

Numerous studies were reviewed and studied to understand principals' perceptions and instructional practices and student achievement. Review and synthesis of studies also aided in knowing what literature is in the field and related to principals' ILPs and student achievement. Selected studies on and related to instructional leadership and ILPs helped develop an understanding of the phenomenon of the study on how principals consistently apply ILPs regarding student proficiency as measured by state test scores.

What is not known and remains to be studied about principals' ILPs and student achievement is subgroups of principal leadership types and the extent to which these subgroups of leadership types and schools may influence student achievement and overall school outcomes (Agasisti et al., 2019). The scope of this study will be focused on one school district in one southern state with a B overall district accountability rating. There remains to be studied principals' leadership practices and student achievement for a more

extensive scope study of an entire state or all the states that still require students to take the algebra state test as a graduation requirement. For the high school class of 2020, 11 states have graduation state test requirements (National Center for Education Statistics, 2017). Klette, Blikstad, and Roe (2017) searched for a link to classroom instruction and student achievement through analysis of student perception surveys, systematic classroom observation, and achievement gains in national tests.

There are limited studies on the nature of effective leadership supporting teaching and student achievement. The mathematics education system has experienced (and continues to experience) intense scrutiny due to acknowledgment of the importance of mathematics to our society and the importance of mathematics to both success in school and life (Hourigan & O' Donoghue, 2016). Research remains to be studied for practices to make the subject of mathematics, especially algebra, more accessible, and sustainable to students. Experts in numerous fields of mathematics, which includes professors and secondary school teachers, continue to research, collaborate, and collectively work together to make mathematics concepts (especially algebraic concepts) and objectives more accessible, attainable, sustainable, and better understood by students and in turn best practices in mathematics instruction are continually being discovered (Cheng, Wang, & Liu, 2019). According to Alsina and Mulá (2019), mathematics teacher's specific knowledge of teaching mathematics is an ongoing concern in mathematics research, especially algebra, because it is known as the gateway to high-level mathematics courses.

Summary and Conclusions

Major concepts of the literature review are: leadership and leadership types, instructional leadership and practices, public schools K-12, principals and their role as instructional leaders, establishing and conveying the vision, facilitating a high-quality learning experience for students, building professional capacity, creating a supportive learning environment, and connecting to external partners. Principals play a vital role in school improvement and establish the tone and climate of learning in their school buildings. As productive leaders, effective principals know what good and effective instruction entail, and provide feedback to guide teachers in classroom decisions in instruction (Farrell & Marsh, 2016). Effective principal instructional leaders work to improve student achievement by focusing on the quality of instruction (Gawlik, 2016) and help define and promote high expectations for teachers, students, staff, and the community with a centralized goal of ensuring students are successful.

What is known in the discipline related to the topic is that a substantial body of research exists on principal ILPs influence on student academic achievement (Adnot, Dee, Katz, & Wyckoff, 2017; Early et al., 2016). Much research exists on the influence of principal ILPs on student achievement through intervening variables like teacher classroom instruction (Tan, 2018). Also, there is much research in the field, describing exemplary instructional leadership characteristics, behaviors, and practices that generally lead to increased student achievement (Mestry, 2017). Leithwood, Harris, and Hopkins (2019) suggested that future studied on school leadership need to extend what is known to explore how school leaders apply specific instructional practices and the resulting

influence of those practices. Leithwood et al. (2019) also explained a need for more empirical research on the application and outcomes of successful school leadership.

Little is known as to why, after years of legislated education reform initiatives, a significant number of secondary students fail to meet passing performance level on algebra state tests required for high school graduation (Kolluri & Tierney, 2019). Studies suggest many principals, while aware of the importance of analyzing data to inform instructional decisions, face challenges in how to support teachers using data to guide lesson planning and instruction for improving instruction adequately (Brighouse, Ladd, Loeb, & Swift, 2016; Wayman, Shaw, & Cho, 2017). Improving student algebraic learning to meet required goals and graduation criteria is a critical area that needs more research (Wayman et al., 2017). Principals instructional leaders with intentions of attaining and sustaining standard educational goals leading to improved student proficiency, direct and guide actions of teachers, students, and parents with decisions, agendas, and procedures (Farrell & Marsh, 2016; Schildkam, Poortman, Luyten, & Ebbeler, 2016).

What is not known in the discipline is how principals may use identified ILPs to support teachers in their day-to-day practices that move low-performing students to high performing status or move high-performing students to exemplary performance (Farrell & Marsh, 2016). Limited studies have explored principal ILPs regarding state algebra test scores, especially low-performing and failing schools with D and F accountability ratings. The present study will fill at least one gap in research practice by examining key

concepts and related literature on principal ILPs and student achievement. The intent of research for this study is to examine how high school principals apply their ILPs supporting teachers' instruction to help students improve their Algebra I proficiency. Recommendations for best principal ILPs in support of teacher's daily instructional practice to help students improve proficiency in Algebra I could be made based on data collected for this study.

Information in Chapter 3 will include a detailed account of the proposed methodology for the study. Included in Chapter 3 are the various roles of the researcher and the selection process for participants. Chapter 3 also includes the research rationale and design, interview protocol, and how data will be collected, managed, and analyzed.

Chapter 3: Research Method

The purpose of this research was to examine the perceptions of school principals at the high schools under study regarding ILPs supporting mathematics teachers to help students to improve their proficiency in Algebra I. High schools for the site district of this study have one principal and two assistant principals at each school at the time of this study. The principal is regarded as the schools' instructional leader of the school and is expected to support all teachers in instruction and learning. Although schools' structures are different, the principal is the primary instructional leader responsible for ensuring completion of all school duties and responsibilities. At each high school at the site district, the principal designates specific duties to each assistant principal. Duties vary and usually include administrative, curricular (including instruction), and behavior issues. For example, one assistant principal was assigned to textbooks and instructional materials, a specific subject area for instructional leadership, and a specific grade-level for student issues such as behavior.

Regarding Algebra I at one high school, the school principal is assigned instructional leadership of all Algebra I teachers and is responsible for supporting the mathematics teachers in instruction. Each school had a lead mathematics teacher and did not have any specialists or coaches. A lead mathematics teacher at each school supports the other mathematics teachers' instruction. However, the focus of this study was on principals' perceptions and ILPs of Algebra I teachers.

Accountability and assessment requirements have prompted a shift in the role of principals from managerial to dual roles of manager and instructional leader (Connolly et al., 2017). The principal, as the instructional leader, has responsibilities of making instructional decisions that positively influence student achievement. Research in the field describes principal instructional leadership characteristics, behaviors, and practices that have empirically been shown to lead to increased student achievement (Mestry, 2017). Student achievement is the main focus of schools.

Methodology for this study and the rationale and appropriateness of the selected method and design are included in Chapter 3. I ed a description of the study in the chapter along with the research question, instrumentation, role of researcher, interview protocol that I used when I collected the data, and a plan for data analysis. I provided a description of the setting, population, and a plan to protect study participants related to ethical issues and confidentiality with informed consent. Also, I described specific strategies and issues related to credibility, transferability, and trustworthiness in the chapter.

Research Design and Rationale

The research question was: What are the perceptions of school principals at the high schools under study regarding ILPs supporting mathematics teachers to help students improve their proficiency in Algebra I? The central phenomenon of this study was principal ILPs, which refers to purposeful educational behaviors, actions, and practices that principals use to improve teaching and to improve learning for student achievement (Shaked et al., 2017). Researchers formulate general research problems

about a specific phenomenon and ask general questions in qualitative studies (Power et al., 2018). A basic qualitative research design is an inquiry of a person, group, or event that involves an investigation of a contemporary phenomenon in a real-life context with unclear boundaries between a context and object of study (Ebneyamini & Sadeghi Moghadam, 2018). Newton (2015) viewed a basic qualitative research design more suitable for the flexibility of data collected to the specific research question(s) and openness for the use of a conceptual category or theory that directs the research and data analysis. I used a basic qualitative research design for this study with a research approach that involved searching for meanings, opinions, or underlying reasons from study participants (Nassaji, 2015). Basic qualitative research design was the best method for this study because an in-depth understanding of ILPs of school principals' perceptions and ILPs was the overall purpose of this study (Merriam, 2009). Compared with other research methodologies like ground theory and phenomenology, a basic qualitative research design was less structured and allowed for more flexibility in the alignment of design (Newton, 2015).

Phenomenology was not appropriate for this study because the focus was not on the commonality of a lived experience within a particular group whose primary intent is to unveil participants' perspectives and lived experiences (Neubauer et al., 2019). I considered case study design, which involves multiple sources of data collection, for this study. However, I dismissed case study design as an appropriate design because I used only interviews to collect data for this study. The purpose of my study was not to discover or construct theory; therefore, grounded theory was not appropriate for my study

(Tie et al., 2019). A quantitative inquiry was not appropriate for my study because the focus of the research was not on attitudes, beliefs, opinions, or ideas. Mixed methods would not have been appropriate for my study because they involve both quantitative and qualitative inquiry.

Role of the Researcher

I designed the study, collected the data, analyzed the data, reported the data collection process findings, and made suggestions for future research. The researcher's role in basic qualitative research design is to attempt to access the participants' thoughts and feelings. According to Alpi and Evans (2019), the researcher acts as an instrument during the inquiry process. I conducted interviews with school principals, because I was the instrument in the study, safeguarding participants, and the data they supplied (Mozersky et al., 2020). Also, I was responsible for clearly articulating to participants the process and mechanisms by which they and the data they provided would be safeguarded. According to Kawulich (2015), the researcher also has an ethical responsibility to preserve the anonymity of participants in all areas of the study, including the final writeup of results and any field notes taken during the data collection stage. To supply understanding and context for the reader, before and during the research process, I acknowledged and stated upfront any possible bias (Sutton & Austin, 2015). I acknowledged perspectives or world views, so readers had a better understanding and rationale for "…filters through which questions were asked, data were gathered and analyzed, and findings were reported" (Sutton & Austin, 2015, p. 226).

Broadly, two types of bias exist: research bias and participant bias. Research bias occurs when a researcher attempts to influence the outcome of their work to produce results they desire. Galdas (2017) referred to research bias as any influence that causes a change in the study results. Participant bias comes from the participant responding to questions based on what he/she perceives to be correct answers or what is acceptable socially rather than what he/she may think or believe to be true. As the researcher, I was a data collection instrument in the site district attempting to access the feelings and thoughts of each study participants that would enable an understanding of the meaning that participants ascribe to their experiences of the phenomenon of this study (Sutton & Austin, 2015). I addressed my role as a data collection instrument in the district by stating the assumptions and biases I may have related to using this site district. I also kept a research journal recording and describing personal reactions and reflections throughout the research process. Member checking, another responsibility of qualitative researchers, is a process used by researchers to improve accuracy, credibility, validity, and transferability (also known as applicability, internal validity, or fittingness) of a study. I member checked with each participant interviewed.

I conducted this study in a school district other than where I am currently employed as a teacher, and I have no personal relationship with participants for this study. I am a current classroom teacher who interviewed principals of schools other than where I am employed. Therefore, there was no supervisory relationships involving power over the participants.

Methodology

Participant Selection

Participants for this study were school principals at each of the schools for the selected site district. Purposeful sampling is a technique used by qualitative researchers to recruit participants who are willing to provide in-depth and detailed information about a phenomenon under investigation (Patton, 2015, 2002). The criteria for a participant for this study was a public school high school principal (or assistant principal) at the site district during the School Year 2018-2019 (and possible still a principal or assistant principal at the site district or no longer a principal or assistant principal at the site district) and supervised and/or evaluated mathematics teachers' instruction of students who initially took Algebra I and the state algebra test during the School Year 2018-2019 study. Willing individuals to participate are necessary for examining any topic, and it is the qualitative researcher's responsibility to ensure participants are accessible and experienced with the phenomenon of interest in a study and accessible. The selection process for potential participants involved the assistance of the site superintendent's using the established criteria for participants (stated above) to select 12 to 15 potential participants.

A qualitative study sample should consist of a sufficient number of participants knowledgeable of the phenomenon of interest and capable of addressing the research question of a study (Vasileiou, Barnett, Thorpe, & Young, 2018). The number of participants for this study was determined by the number of volunteer participants from the 6 potential participants meeting the established criteria or theoretical data saturation

(Vasileiou et al., 2018). Theoretical data saturation is the point in data collection when new data no longer bring additional insight to the research question (Dworkin, 2012; Saunders, 2018). After successful submission and University Research Reviewer approval, I submitted my proposal to the Institutional Review Board for approval. In an email, I asked the site superintendent for permission for the site district to participate in the study (Appendix I). In reply to the site district permission email (Appendix G), the superintendent agreed to give permission for the site district to participate in the study and signed a Partnership Organization Agreement (Appendix A). After receiving IRB approval (IRB #09-22-20-0629557) to proceed with the research for this study, I utilized the help of the site superintendent to identify and select potential participants for my study. In an email (Appendix H), I thanked the superintendent for giving permission for the site participation in the study and asked for help to identify potential participants for the study, based on established criteria for participants in an invitation letter attached to the email (Appendix E). Also, I asked the superintendent to forward the invitation letters to participants through school emails ensures the letters will be delivered.

Instrumentation

Primary instruments for data generation in qualitative inquiry are the researcher and interview questions (McGrath, Palmgren, & Liljedahl, 2019), and tools or methods researchers will use to measure items of interest to collect data is referred to as instrumentation (Burkholder, Cox, & Crawford, 2016). According to Patton (2015), a researcher's interview protocol is an instrument of inquiry and conversation for posing questions to participants about their ideas, experiences, or life. Interview questions are

composed differently from research questions to initiate inquiry-based conversation (Maxwell, 2015). Interview protocol was the data collection instrument for my study. I conducted interviews using Zoom and recorded the audio. Interviews acknowledged as an acceptable qualitative technique of inquiry, allow researchers to examine for insight from participants who have experienced or experienced the phenomenon of the proposed study (Irvine, 2018).

I created open-ended questions that served as the interview protocol for my study. Castillo-Montoya (2016) stated that the utility of interview questions and confirmation of their purpose could be increased with the alignment of interview questions to the research question. I created inquiry open-ended interview questions (Appendix D) to stimulate conversation to obtain relevant descriptive data from participants. For clarity and focus, the conceptual framework and literature review were the basis for the interview questions.

Majid et al. (2017) revealed that preparation for a significant study, regardless of the paradigm, should include a pilot study. However, some scholars agree that although completing a pilot study is useful to conduct, they are not always necessary in qualitative inquiries with interview questions since interview questions are designed to be unique. The semi structure of interviews is a tentative guide, and replicability is not the intention. A field test is typically completed by experts in the field who review an untested set of interview questions to ensure risk level, validity, dependability, and credibility (Northcentral University Institutional Review Board, 2019). During the field test, I

obtained feedback on interview questions to enhance the reliability or trustworthiness of questions. I obtained feedback about the interview questions from two principals serving algebra students from districts other than the site district of study to ensure credibility, dependability, and validity. The principals' feedback allowed for a degree of understanding of interview questions, and if participant understanding of the interview questions was evident as questions were written (Patton, 2015).

Castillo-Montoya (2016) emphasized sufficient data collection method(s) can mean the difference between useful insights and time-wasting misdirection in a study. I discussed the interview questions with the two high school principals to ensure the questions would elicit responses and data that would answer the research question of my study. To eliminate participant bias, I collected data using consistent interview protocol procedures, selected study participants according to selected criteria of this study, ensured data analysis was reliable, and triangulated data.

Procedures for Recruitment

I utilized complete transparency in the recruitment procedures for this study. Recruiting participants, according to Archibald and Munce (2015), is one of the most challenging parts of conducting research. On the same day of receiving IRB approval, I contacted the superintendent of the site school district by email requesting names and email addresses of school principals during the School Year 2018-2019 that supervised mathematics teachers' instruction of students that took the Algebra I course and the state algebra test. On the same day of receipt of participants' names and email addresses, I

invited each potential participant to volunteer to participate in the study by email (Appendix E). The invitation email contained my name and institution information, the purpose of the study, and a Leader Interview Consent Form. The Leader-Participant Interview Consent Form (Appendix B), located within the interview email, included the following information: interview procedures, voluntary nature of the study risks and benefits of being in the study, privacy information about confidentially and anonymity of identity and any collected data, and contact information should potential participants had any questions on concerns.

Procedures for Participation

Participants were provided informed consent within the body of the invitation email in the Leader Interview Consent Form (Appendix E). If a participant volunteered to participate in the study, directions in the Leader-Participant Interview Consent Form (Appendix B) instructed potential participants to reply to the invitation email with the words "I consent." If a potential participant replied “I consent” to the invitation email, I accepted the reply as the participants’ consent to voluntarily participate in the study. Within one hour of receiving a consent to participate in my study, I sent an email to thank the participant for volunteering and in the schedule interview email I directed participants to click on the "Schedule Interview" Form (Appendix F) embedded link to schedule an interview time. To confirm the participants’ selected interview time, I replied to the scheduled interview with the participant selected interview time and the Zoom meeting identification number and password for the interview and link.

Procedures for Data Collection

I used interview protocol (Appendix D) to collect data from each participant during each interview for this study. Also, in consideration of possible conflicts with scheduling interviews, I interviewed participants with Zoom software. Internet-based methods of communication, VoIP technologies like Zoom are becoming viable options for collecting data (AlKhateeb, 2018; Iacono, Symonds, & Brown, 2016). VoIP allows research participants to be interviewed using voice and video across the internet or phone by a real-time connection. AlKhateeb (2018) argued advantages of using VoIP technologies (increase the variety of sample; no limitations with a place, time, and location of interviews; reduced financial costs of research) and emphasized at the same time VoIP limits (Seitz, 2016) researcher ability to see all nonverbal cues during an interview and affects areas of rapport with participants.

I recorded each interview using Zoom software and manually transcribed the data. Data collection occurred one time for each participant during a Zoom interview for approximately 60 minutes. Zoom software recorded the audio of each interview and one participate elected to be on camera during the interview. At the beginning of each interview, I reminded each participant the interview was voluntary, and if at any time during the interview, they could opt-out if they choose. I began the data collection process with collecting of participants' names and email addresses from the school district superintendent. I continued the data collection process with participants who volunteered to participate in the study with a reply to the invitation email with the words "I consent." The data collection process included the audio recordings, transcribed

interview data, corrected and additions to transcripts made during member checking, recorded field notes during each interview, and other collected deidentified organization data.

I started each interview thanking participants for volunteering to participate in the study and informed participants the interview would take approximately 60 minutes. I also informed participants I would ask questions about their time as a principal at the selected school site. Before starting each interview, I stated the purpose of the interview and then started asking interview questions and took notes on the interview protocol document of relevant and interesting ideas. I closed each interview out thanking participants again for volunteering to participate in the study and informed participants that within 24 hours I would email a draft copy of the interview transcript for them to review for accuracy, clarification, and any possible misinterpretations of their responses to interview questions. I also informed participants upon receipt of their transcript they would have 12 hours to respond with any corrections or additions.

I informed participants that if their transcript was accurate as transcribed they would not need to reply to the email and their transcript would be assumed to be correct and verified as transcribed. Additionally, participants were informed that if desired to add to a response(s), they could in reply to the draft email with 12 hours and then they would be exited from the study. Finally, participants were informed after 12 hours of receipt of their draft emails if no response was received I would assume their transcript was verified and accurate as transcribed and they would be exited from the study.

Member checking. McMahon and Winch (2018) stated that systematic debriefing through dialog and discussion of data immediately after data collection and transcription of data is an essential step in data analysis. For some studies that might involve some deceit in aspects of the study, after subjects' involvement debriefing is used to inform participants of the study's intentions and why the subject may have been deceived about some aspects of the study (Allen, 2017). A debriefing occurs after the study and occurs between the researcher and study participants in structured or semi structured conversations where all parts of the study are reviewed (Allen, 2017). Member checking occurs during the research process and is the process used for participants to exit the study.

Member checking is a technique used by qualitative researchers to maintain validity, improve accuracy, and transferability of a study (Candela, 2019; Thomas, 2016). Within 24 hours of completing each interview, I manually transcribed each participant's transcript and emailed them a draft copy for member checking. In the transcript email, I directed each participant to verify transcripts, within 12 hours, for accuracy, clarification, and any possible misinterpretations of their responses I may have made. I also asked participants to add any further responses to any interview questions they may have neglected to include during the interview. In the email, I informed each participant that if there were no corrections or addition to be made, there was no need to reply to the email and their transcript would be assumed to be correct as transcribed. However, I informed participants any corrections or additions to be made to any interview question would need to be communicated in the form of a reply to the transcript email within 12 hours. Once

participants exited the study, I began analysis of the study's data. After completing the study, I will email a summary of the study findings to each study participant and ask them to respond with their phone number if they desire to set a time to discuss further aspects of the study. I will also thank each participant again for participating in this study.

Journal and memo writing. I used a journal and stickie notes to write summative statements during the research process. Journal and memo writing were essential to document the research process and the thinking processes when I collected and analyzed data for this study. I used journaling to document unexpected events and problems and to document emerging patterns of similarity in data analysis. I tracked my thoughts over time through journaling and memo writing and they served as the first draft of the final report and aided in writing the findings of my study.

Data Analysis Plan

Qualitative data analysis entails a range of procedures and processes that involves identifying, examining, and interpreting patterns and themes for a more in-depth understanding of the phenomenon and answering research questions (Braun & Clarke, 2019). Thematic analysis (TA) is a type of qualitative data analysis in which textual data is illuminated or highlighted into themes (Vaismoradi, Jones, Hannele, & Snelgrove, 2016). Codes are used by researchers to break data down to chunks or groups of information like words, sentences, phrases, or paragraphs to analyze and reorganized in patterns and themes to answer the research question (Braun, Clarke, & Weate, 2016; Ngulube, 2015; Scharp & Sanders, 2018). TA involves description and interpretation

(Holloway & Galvin, 2017) and is suited primarily for higher levels of description than abstract interpretation (Vaismoradi & Snelgrove, 2019). Therefore, TA was appropriate for the analysis of data collection of my study because the process involved transforming raw data collected from interviews through analysis into interlinked and related themes to form a thematic network to answer the research question for this study. Survey Monkey was not appropriate to use for data analysis of interviews because it is more suited for collecting data like for surveys. I collected and analyzed textual data with application of the six phases of TA to answer the research question of this study: familiarization, coding, theme development, refinement, naming, and write up. I submerged and engaged with the data to answer the research question linked to the data through the implementation of the six phases of TA. Interviews and field notes were the data collection tools I used to collect data in my study. I triangulated with interview transcripts, member checks, the conceptual framework, and related literature review.

I used a letter and two number combinations to identify each school, participant, and interview response. For example, School A, Participant 1, and were identified as A11and School B, Participant 2, and interview question 5 were identified as A25. I created a Microsoft Word document template (hereafter referred to as template), using the Review, Highlight, Track Changes, and Comment features of Word. The template contained the research question at the top of the document (bold type) with the selected anchor codes highlighted in different colors, and each interview question (bold type). In the right margin of the template, I typed each anchor code beside each research question.

This template allowed quick access for participants' textual data responses and ease of reading the transcript. I designed the template precisely for organization of data.

Phase 1 of Thematic Analysis is familiarization. Familiarization involves the researcher reading the data searching for concepts and ideas to address the research question and reading again in a questioning way to facilitate analytic engagement (Braun et al., 2016). To prepare for coding, I immersed myself in the data and became thoroughly familiar with the data (Woodall, 2016). Within 12 hours of completing each participant interview, I began the familiarization phase of TA and manually transcribed the raw data of each participants' audio recording using Microsoft dictation software on a computer and the template to expedite time. As I completed each participant's transcript, I saved the transcription with the identifying school letter, number, anchor codes, and the word -draft (e.g., A5-draft). Then after removing the identifying school letter, number, anchor codes, I emailed a draft transcript to each participant within 24 hours of completing the interviewth directions to read their transcript with 12 hours to verify accuracy of my interpretation of their responses. Also, in the email I directed participants to add any additional responses they may have to any interview question. Instructions in the transcription email also directed participants that they need not reply to the email if the responses to each question were correct as interpreted and typed.

According to only one participant's reply to the transcript email, I made stated corrections and additions to the appropriately saved transcript, resave the revised final document without the word draft (e.g., if the draft was saved as B2-draft the revised final

document was saved as B2), and then printed a hard copy of the final transcript. After 12 hours, if a participant had not responded to the transcript email, I assumed the participant draft copy of the transcript was correct and saved the draft copy without the word -draft but with the symbol * to indicate that no corrections or changes had been made to the original draft copy of the transcript. I saved and printed a hard copy of each participant's final transcript as each participant was exited from my study. I completed an initial reading of the final transcript with 24 hours. I read and reread the data as much as necessary and became thoroughly familiar with the data before I started to code of each participant's final transcript.

Phase 2 of Thematic Analysis is coding. Coding is a process that involves assigning descriptions and making interpretations of the study participant's ideas, perspectives, and experiences. A significant step in TA, coding, establishes a firm foundation for theme development, and as coding evolves, the more analytically engaged the TA process becomes (Braun et al., 2016). I made codes brief and succinct (Woodall, 2016) to move through the qualitative data and analysis process. I used coding to manage data and to connect each participant interview data responses to the research question for my study. I transformed my familiarization phase of TA with coded participant's transcript of identified, highlighted color, and labeled anchor codes and salient passages of text that related to the research question (Woodall, 2016). My action of coding was an iterative and slow process that consisted of a thorough systematic process of assigned labels to words or phrases that represented important and recurring themes that addressed the phenomenon and research question of my study (Braun et al., 2016). I rotated back

and forth through phase 1, familiarization, and phase 2, coding. Braun et al. (2016) recommended coding a second time and possibly a third or fourth time. Phases 3-5 involves core analytic work of TA: theme development, refinement, and naming. I sought to gain a more in-depth and thorough understanding of the insights into answering the research question while searching for and reviewing themes (Braun et al., 2016).

Phase 3 of Thematic Analysis is theme development. Coding involves labeling words, phrases, or chunks of words that capture the essence of data. However, analyzing is a process that entails searching for relationships or connections between coded data. I continued analysis in making sense of the accumulate codes to develop themes. With relevant coded data, I was prepared to construct themes relevant to address the research question. Therefore, I ensured that all potential codes were identified and were substantial at this stage. Themes have diverse meanings and ideas, unlike codes which represent single ideas of simple summarizing for the importance and implications of data (Braun et al., 2016). I categorized codes and generated themes based on relationships between codes, code frequencies, and underlying meaning across codes from interviews to answer the research question. I aimed to generate a theoretically informed analysis of the codes where concepts from the conceptual framework could be compared to developed themes. I assessed developed themes to ensure they were relevant. The more the participants mentioned an idea or subject, the more relevant the idea or subject qualified as a relevant theme.

I printed a copy of each participant's highlighted and labeled Word document to make a visual model of accumulated codes.pant's transcript to cut data to paste to individual notecards. With a white notecard and a participant's response to an interview question, I cut out a highlighted passage and the corresponding code for the cut-out passage. The passage and the code were pasted on a notecard and I wrote participant's identifying letter and now two numbers combination in the upper right-hand corner of the card for ease of referring back to the full transcript if needed later. For example, School A, Participant 1, Interview Question 1, was identified as A1l and School B, Participant 2, Interview Question 5 will be identified as B25. This process continued to be used until notecards were made for all highlighted text and labeled codes for each participant's transcript. Then I repeated the process for each participant's highlighted and labeled transcript. I used the cards to form a visual model for manual manipulation of data in the process of searching, analyzing, and interpreting.

First, I compiled the notecards into stacks according to the anchor codes assigned. Then I categorized each stack of cards based on relationships between codes, code frequencies, and underlying meaning across codes. I ensured that the abstract information that I developed could be linked back to the data collected from the interviews to address the research question. Woodall (2016) affirmed that researchers must ensure ideas and themes developed in the analysis are grounded in the original data set to demonstrate trustworthiness. The patterns I discovered in the categories allowed me to the develop themes, which were theoretical constructs supported by the data. To progress from the category codes to the themes, I used categories to narrow down and identify themes. In

developing themes, I translated the participants' perspectives into the language of decision making and practice. The themes I developed represent a summary of participants' daily actions and reactions when faced with certain phenomena and could be used to design interventions in education (Colorafi & Evans, 2016). Some codes may be expanded into sub-groups called sub-themes. Still, other codes may be discarded or kept as outliers. In this phase, I developed a collection of themes and subthemes that captured and unified my study's phenomena into a meaningful whole.

Phase 4 of Thematic Analysis is refinement. Refinement involves reviewing and possible tweaking or revising themes. I reviewed at the level of the coded data to ensure all data formed a coherent pattern by rereading all extracted data in each theme. Some of the themes may require breaking down into the same sub-themes, and some themes may collapse into other themes. I also used my physical model of accumulated codes to aid in visualizing and verifying relationships between themes. For relationships between themes that did not reflect the meaning of the whole data, I returned to theme development and refinement. For relationships between themes that did reflect the meaning of the whole data, I moved on to defining and naming the themes. The physical model was a visual representation of the relationships and any interlinking relationships between codes.

Phase 5 of Thematic Analysis is naming. I selected an appropriate name for each theme in this phase. In developing themes, I created an overall narrative for the data collected during each interview. I verified if any themes contained sub-themes. In

selecting the appropriate name for each theme, I ensured the selected name was forceful and captured the essence of the data represented by each theme. Each theme name is relevant, concise, clearly demarcated, and distinguishable from each other. I presented each theme as a coherent, theoretically engaged story of participant's perceptions and ideas. A sense of what the theme is about is immediately sensed when a reader reads the name. After continuous revisions of themes related to the data collected, I produced a final thematic map and describe each theme in a couple of sentences.

Phase 6 of Thematic Analysis is the write up. In working through all phases of TA, I developed a process to answer the research question. In the writeup, I detail concise and sufficient evidence of each theme using vivid participants' quotes from data to support the study's findings. I referred back to key and relevant notes, documented with of the thinking the process of ideas that came to mind during each interview in the left margin of transcripts during the interview and notes written in the left margin of the final transcript when coding, to aide in writing the research findings. Also, I used any notes written on notecards, the journal, and memos to write the research findings. I used the stated items to develop, compile, and edit existing analytical writing (Braun et al., 2016) to write the final findings of the research and answer the research question.

Trustworthiness

Researchers have several duties and responsibilities when designing and undertaking research and are ethically bound to state and minimize bias. Camfield (2019) said for findings to be rigorous and useful in practice, it is critical and necessary for

researchers to evaluate the quality of research (Morse, 2015). Tong and Drew (2016) suggested using a rigorous approach when conducting qualitative research. Burkholder et al. (2016) said to ensure credibility, transferability, dependability, and confirmability of finding refers to legitimizing the findings.

Credibility

Credibility, also known as internal validity, involves establishing findings in a research study are accurate and correct (Hammarberg, Kirkman, de Lacey, 2016). According to Anney (2015), the rigor of inquiry is established by the qualitative researcher through adopting strategies of credibility. Birt, Scott, Cavers, Campbell, and Walter (2016) stated that member checking is critical for any qualitative researcher and is at the heart of credibility. During the analysis and interpretation of data, researchers are required to include participants' voices. I used member checking to establish credibility in this study. To ensure there was no bias in interpretation, I asked each study participant during member checking to verify the accuracy of interpretation of their responses. There were no inaccuracies identified by any participant in the study. Also, during the member checking process, I asked each participant if the interpretation of their responses need further expansion and one participant added to one of their responses.

Transferability

Transferability, also known as external validity, refers to the degree to which qualitative research results can be transferred to other contexts with other participants (Naeem, 2019). Through purposeful sampling and thick description, Naeem stated the

researcher facilities transferability. When the researcher provides detailed descriptions of participants' responses, the transfer of inquiry is facilitated. Connelly (2016) stated that researchers maintaining a reflective journal could obtain neutrality and transparency in qualitative research. I maintained a journal throughout the research process and provided sufficient thick descriptive details about the findings to ensure the likelihood research findings of this study had meaning beyond this study. As a researcher, I cannot prove that this study's findings will apply to other districts and schools. Instead, I "provide the database that makes transferability judgments possible on the part of potential appliers" (Guba, 1985, p. 316).

Dependability

Dependability, which refers to the stability of data over conditions and time (Naeem, 2019), is essential to trustworthiness because it establishes research study findings as consistent and repeatable. Therefore, I aimed to verify that this study's findings were consistent with the raw data collected from interviews. As dependability relates to this study, I wanted to ensure that if some other researchers were to evaluate this study's data, similar interpretations, findings, and conclusions would result. Code-recode strategy involves coding data twice and waiting for a gestation period of 1 to 2 weeks, and dependability is achieved if the results of the analyses are the same or similar. I coded and recoded data collected from participant interviews data twice. However, due to time limitations, I waited for a gestation period of one week. I applied an audit trail to ensure the dependability of the research finding. To promote dependability, during each step of the data collection process, I maintained detailed notes of my thoughts in a

reflexive journal to increase the accountability of research findings (Korstjens & Moser, 2018).

Confirmability

Confirmability, according to Amponsah et al. (2020), refers to the degree to which the results of an inquiry could be confirmed or corroborated by other researchers. Confirmability of inquiry of this qualitative research was established through reflexive field journals, triangulation, and an audit trial (Abdalla, Oliveira, Azevedo, & Gonzalez, 2018). An audit trail is a process of researching and giving an account for all research activities and decisions to validate data by examining the product and inquiry process to show how data were collected, recorded, and analyzed (Connelly, 2016). Throughout the research process, I maintained a detailed reflexive journal to verify and check the data to promote transparency.

Alignment is the key to a strong research study (Weintraub, 2017). The problem statement, purpose statement, research question, and items on the instrument are the alignment items for this study (Weintraub, 2017). There was complete alignment to address the selected topic. Alignment started with identifying the problem worthy of doctoral research followed by the purpose of the study and research question. The problem statement, purpose statement, and research question are the foundation for this research study's remaining content. The problem statement succinctly describes one problem. The first sentence of the purpose statement aligns directly with the problem statement and includes the research, method of design, geographical location, and

anticipated contribution research practice. Each element of the purpose statement supports addressing the problem statement. The research question aligns with the problem and purpose statements and directs the central inquiry of the study. Answering the research question was the intent of this research. This study's writing and research process become clear and narrowly focused on proper alignment of the four foundational elements of this study: problem statement, purpose statement, research question, and instruments of this study. I eliminated needless research and work outside the area of the selected topic by realizing the whole dissertation flows from the alignment of the four foundational elements.

Triangulation is a qualitative process that uses multiple data sources to cross-check and ensure the credibility of research findings (Marshall & Rossman, 2016; Renz, Carrington, & Badger, 2018). Fusch, Fusch, and Ness (2018) emphasized triangulation to increase reaching data saturation, minimize bias, and promote social change. Patton (2015) stated that studies with solely one source of data collection are more vulnerable to error and researcher bias. According to Fusch et al. (2018), triangulation can be used to increase the depth and understanding of data collected for a study. Therefore, I used the constant comparison approach to triangulate all the data collected from interview transcripts, member checks, conceptual frameworks, and related literature reviews.

Ethical Procedures

I had institutional research board approval to conduct this research. Upon approval of the proposal and approval of the IRB, I gave participants informed content in

an invitation email to participate in the study. I also reminded participants that their participation in the study was entirely voluntary. At the beginning of the interview, I informed participants that if at any time during the interview, they decide to opt-out of this study, any data collected would be destroyed.

I was ethically considerate throughout the research. Potential to harm individuals, institutions, and the profession of research can result from unethical types of research (Anabo, Elexpuru-Albizuri, & Villardón-Gallego, 2019). I was aware and used ethical principles of autonomy, justice, and beneficence throughout the research: (a) to address fundamental and ongoing issues that arise from the research; (b) to meet goals of the research; and (c) to maintain the rights of each research participant (Anabo et al., 2019). During all stages of a study from designing to reporting, researchers are faced with ethical challenges such as the potential influence of the researcher on participants, the potential influence of participants on the researcher, anonymity, confidentiality, and informed consent (Baker et al., 2016). Due to statistical analysis not being a part of qualitative studies and possible validity issues, I evaluated and interpreted collected data and made observations of participants' responses to interview questions (Baker et al., 2016). In conjunction with pre-established guidelines and protocols, I developed the interview protocol specific to the purpose of this study that reflected ethical concerns.

I was ethically considerate of each participant in promoting and protecting privacy, informing participants accurately, and presenting unbiased information (Gyure et al., 2014). Regarding ethical concerns related to materials that I recruited and data that I

collected, I assured each participant that their identity was not linked to their interview responses or any other collected data. I assured each participant collected data would be stored securely on a password-protected computer. I anonymized all data collected for this study to protect all identities in this study. I also informed each participant that at any time during the interview, if they decided to opt-out of this study, any data collected would be destroyed. I will keep the data for this study for 5 years on a password-protected computer, and then I will delete the data from the computer.

Summary

In Chapter 3, I included a summary of the methodology used in this basic qualitative research study, a description of methodology and design, and the researcher's role in the study. Interview protocol, setting, and instrumentation used to conduct the study are included in Chapter 3. Also included in the chapter are procedures used for recruiting and selecting participants, collecting data, analyzing data, and storing data. Sections on credibility, transferability, dependability, confirmability, ethical procedures, and a summary of content for the chapter are included in Chapter 3. Chapter 4 contains sections describing the setting, data collection, and data analysis. Also, a section describing the results of the data collected are included in Chapter 4.

Chapter 4: Reflections and Conclusions

The purpose of this research was to examine the perceptions of school principals at the high schools under study regarding ILPs supporting mathematics teachers to help students to improve their proficiency in Algebra I. Another aim of this study was to bridge the gap in research practice because a large body of literature has shown principals need to be instructional leaders for improved student achievement, there is little research indicating the principals' role in applying instructional leadership for increased student Algebra I proficiency. As a part of teacher evaluation, many states require principals to observe teacher instruction several times throughout the school year. Therefore, I attempted to add to the literature of principals' application of ILPs concerning classroom instruction and student Algebra I proficiency. One research question guided the research of this basic qualitative study: What are the perceptions of school principals at the high schools under study regarding ILPs supporting mathematics teachers to help students improve their proficiency in Algebra I?

This chapter also includes the setting and an overview of the demographic information related to this study is provided. Techniques I used to collect and analyze data is included in this chapter. I include information protocols I used to address trustworthiness issues and a summary the results of my study. Also, I include in Chapter 4 an interpretation of the findings, limitations of the study, recommendations based on results of the study, and implications for social change. I include the conclusion in Chapter 5.

Setting

The setting for this study was a small comprehensive K-12 school district in a suburban city in Mississippi. At the time of this study there was a nationwide Coronavirus 19 (COVID 19) pandemic that deemed the nation under a Center for Disease Control (CDC) mandate for limited social gatherings and social distancing. Conditions of COVID 19 warranted the nation's schools (and worldwide) to close face-to-face learning in schools in the spring of School Year 2019-2020. During the shutdown in the spring, majority of schools implemented some form of distance learning using technology. During School Year 2020-2021 many of the nation's schools reopened, under suggested safety guidelines from CDC, with distance learning, face-to-face instruction or a combination of both. However, many schools had faced challenges with the reopening of schools that had resulted in many schools closing again for extended periods to quarantine due to a high number of student, teacher, and/or faculty COVID 19 cases in their districts.

The site district for this study was one such district that had faced and was dealing with challenges of school closure for quarantine due to COVID 19 cases during my study. Conditions and circumstances of COVID 19 influenced the number of participants willing to volunteer for this study and influenced the method of collecting data. Each research participant was interviewed using Zoom software at the place each participant deemed convenient and appropriate using their own device to respond to my interview questions. Two participants (33%) were interviewed for this study of six potential participants.

Demographics

At the time of this study the student population was over 2,400 students, 150 teachers, and six schools. Two of the six schools are high schools (one Junior High and one Senior High). The ethnic breakdown for the district during the 2018-2019 school year included 60% minority compared to 56% for the state (Tables 6 and 7). Seventy-five percent of the students are eligible for free or reduced lunch. The school district was ranked in the top 50% of the 150 school districts in the state. I conducted Zoom interviews with only the principals of each of the high schools, one junior and one senior high principal, who served Algebra I teachers and students the School Year 2018-2019. None of the assistant principals from either the junior or senior high school volunteered to be a participant in this study.

Table 6

Site District Student Enrollment by Subgroup School Year 2018-2019

Group Name	Group Number	Group Percent
Female	1199	51.22%
Male	1142	48.78%
Asian	19	0.81%
African American	1323	56.51%
Hispanic or Latino	66	2.82%
American Indian or Alaskan Native	*	*
White	920	39.30%
Two or more races	*	*
Native Hawaiian or Pacific Islander	*	*

Note. Mississippi Department of Education, 2019a. Mississippi Academic Assessment Program (MAAP) results.

* Represents suppressed data to prevent the identification of individuals in small cells or with unique characteristics.

Table 7

State Student Enrollment by Subgroup School Year 2018-2019

Group Name	Group Number	Group Percent
Female	230232	48.92%
Male	240436	51.08%
Asian	5125	1.09%
African American	226491	48.12%
Hispanic or Latino	18762	3.99%
American Indian or Alaskan Native	1090	0.23%
White	207166	44.02%
Two or more races	11729	2.49%
Native Hawaiian or Pacific Islander	305	0.06%

Note. Mississippi Department of Education, 2019a. Mississippi Academic Assessment Program (MAAP) results.

The administrative structure for CPSD starts with the district board of education and the superintendent of education who reports to the district school board. Each of the elementary schools has one principal, and each of the high schools has one principal and two assistant principals. In addition to principals, each school has teachers, counselors, teacher assistants, custodians, and each elementary teacher has a teacher assistant. At each high school, principals designate specific duties for each assistant principal that

includes various administrative, curricular (including instruction), and behavior issues duties. The principal and assistant principals at both high schools supervised instruction of all teachers that included routine daily walk throughs to observe teacher instruction and student learning especially in subject area tested courses such as Algebra I.

During the School Year 2018-2019, an accountability rating of B motivated the site district to move its mark of excellence with consistent research-based practices and behaviors necessary to maintain and sustain academic excellence moving forward. The site district had 57.6 % of their students scoring a level 4 or 5 on the state Algebra I test compared to the state average of 49.3% of students scoring a level 4 or 5 (Table 8). Research for this study focuses on high school principal perceptions and ILPs in support of mathematics teachers to help improve student proficiency in Algebra I.

Table8

Algebra I Mississippi Academic Assessment Program (MAAP) Results

Performance Level Descriptor	CPSD Percent	State Percent
Minimal – Level 1	1.1%	1.6%
Basic – Level 2	5.3%	11.3%
Pass – Level 3	36.0%	37.8%
Proficient – Level 4	38.6%	39.7%
Advanced – Level 5	19.0%	9.6%

Note. Mississippi Department of Education, 2019a. Mississippi Academic Assessment Program (MAAP) results.

Teachers, at the study site, had voiced concern to senior district administrators that school principals are inconsistently applying ILPs to support mathematics teachers for students to improve their proficiency in Algebra I (senior district administrator, personal communication, March 27, 2018). According to the District Board Minutes documents between 2016 and 2019, teachers had voiced concern that school principals struggle as instructional leaders to support them (Board Minutes 2018, study website). The problem was that school principals at the high schools under study had been inconsistent in applying ILPs supporting mathematics teachers for students to improve

their proficiency in Algebra I. ILPs, for this study, will refer to purposeful educational behaviors and actions by school principals aimed to improve teaching and to improve learning for all students (Shaked, Gross, & Glanz, 2017). Potential findings of the study may include new information about school principals' perceptions, and application of ILPs to promote student proficiency in Algebra I. Findings may contribute to positive social change by principals' consistent application of ILPs to help teachers assist students in improving their Algebra I proficiency. Fndings from my study may also guide future research in school leadership and the development of effective principal leadership in practice.

Data Collection

I began the data collection process with an email to the site school superintendent initiating help with email addresses of six potential participants for the study. I used interview protocol (Appendix D) to collect data from two participants during one session for each. In consideration of CDC nation-wide health mandates and guidelines for social distancing and possible conflicts with scheduling interviews, I interviewed participants with Zoom software. I used a computer and the audio feature of Zoom to collect data one time from each participant for approximately 60 minutes. Before starting each interview, I stated the purpose of the interview and informed each participant they would be asked questions about their time as a principal at their school site. I asked participant the same 12 questions during each interview session and allowed each participant to respond to each question to collect data to address the phenomenon and research question of my study (Appendix D). I concluded each interview session with thanking each participant

for volunteering to participate in the study and each was informed that within 24 hours they would receive an email draft copy of their interview transcript for validation of accuracy, clarification, and any misinterpretations of their responses to interview questions. Finally, participants were informed they would be exited from my study upon validation of their transcripts.

I collected and analyzed textual data throughout implementation of a 6-phase thematic analysis (TA) process to address and answer the research question of my study: familiarization, coding, theme development, refinement, naming, and write up. TA was appropriate for the analysis of data collection of my study because the process involved transforming raw data collected from interviews through analysis into interlinked and related themes to form a thematic network to answer the research question for my study. Survey Monkey is more suited for collecting data like for surveys and was not appropriate to use for data analysis of interview data collected for my study. I submerged and engaged with the data to answer the research question linked to the data through codes and themes. I used interviews and field notes as data collection tools for my study. I triangulated interview transcripts, member checks, the conceptual framework, and related literature.

Data Analysis

Upon receipt of only two of six potential principal email addresses for each of the high schools in the site district from the site superintendent, I emailed each participant invitations to volunteer in my study. I included a description, purpose of the study along a

letter of consent to interview (Appendix E), and the criteria for participants for the study in the invitation emails. Both participants responded “I consent” to the email invitations to volunteer to participate in my study. The superintendent, in an email with principal email addresses, admitted to being unsure as to how and what duties each of the two principals assigned to each of their two assistant principals. Therefore, the superintendent recommended each principal be given the criteria for participants for the study to determine if the other four potential participants met criteria for this study. One principal stated the two assistant principals did not meet the criteria for the study and therefore did not supply email addresses. The other principal determined the other two potential participants did meet criteria, but the participants did not volunteer to participate in my study.

I found patterns and similarities in the collected data through engagement and application of the six phases of TA. Then triangulation of interview transcripts, member checks, the conceptual framework, and related literature review I linked the collected data to answer the research question. I began the familiarization phase of TA within one to two hours of completing each interview with directed reading for the anchor codes, perceptions and ILPs. During the initial directed reading of each transcript, I took additional notes in the margins of each initial transcript. I emailed each participant their interview transcript for verification of their interview responses within 24 hours of completing each interview. In the transcript email, each participant was directed to respond to the email within 24 hours if there were any corrections or if they wanted to add to any of their responses. Participants were informed that upon receipt their email

response with any corrections and/or any additions to responses they would be exited from my study. Participants were also informed that if an email response had not been received after 24 hours, I would assume their transcript was correct as transcribed and they would be exited from the study. Upon receipt of additions to a responses from one participant, I made additions and exited that participant from my study. After 24 hours of no response from the other participant's transcript email, I assumed the transcript was accurate and correct as transcribed and exited that participant from my study. After I exited each participant from my study, I created a Word document template (hereafter referred to as template) to manually code participant raw data. I designed the template to organization of the collected interview data. I placed the research question at the top of the document in bold type with the selected anchor codes highlighted in different colors in the right margins. Each interview question was left-aligned in bold type. I obtained 40 codes from the initial manual coding of the participants transcripts.

During the initial coding phase of TA, I used a letter and two number combinations process to identify each school, participant, and interview response. For example, School A, Participant 1, and interview question 1 were identified as A11and School B, Participant 2, and Interview Question 5 were identified as A25. I used the letter number combination to identify each transcript and later to identify each note card used to create a visual model of the coded participants responses that directly addressed the research question. I used the review, highlight, track changes, and comment features of word to identify, analyze, and code selected passages of text in each participant

transcript. I typed each anchor code in the right margin of the template beside each interview question.

Using notecards and poster boards in preparation of the development of themes in phase three of TA, I constructed a visual model of the coded data. I printed each participant's color-coded transcript and cut out each participants question response and attached each one to a notecard. To be able to correctly identify each participants response to each question, I labeled each notecard using the one letter and two number process stated earlier. The physical model enabled me to have hands interaction with the collected data. Also, the physical model allow for ease in theme development and refinement phases of TA in sorting, consolidating, and clustering codes in finding relationships and patterns to address the research question. I formed three clusters of similar and interrelated codes through the iterative and cyclic process of coding, theme development, and refinement. I used the three clusters to address the research question.

Results

Through the emergence of three themes, I answered the research question, what are the perceptions of school principals at the high schools under study regarding ILPs supporting mathematics teachers to help students to improve their proficiency in Algebra I: (a) building strong relationships, (b) facilitating high-quality learning experiences, and (c) supporting teachers in building professional capacity.

Theme 1: Building Strong Relationships

High school principal's perception of leadership in instruction are varied and diverse with regard to how teachers should be directed and guided in their planning and delivery of instruction to students daily. Participant 1 (P1) and Participant 2 (P2) agreed their district and individual school visions and goals should be communicated to all teachers, faculty, and students from day one and ongoing throughout the school year. P1 responded that "I meet with all my staff together the first day at Convocation and I share the district and school vision and goals of what they are going to be for that year". Both P1 and P2 also shared the perception that, as the instructional leaders of the school, they ensure all teachers and student know how scores work and that everyone is responsible for the student's scores on each state test. P1 added that "We make sure they understand how the scores work. It is important for a student to understand how you move from a 1A to a 1B or how you move from a level 4 to a level 5."

Teacher and student buy-in was quoted by both P1 and P2 as important in building strong relationships with teachers and students that ultimately affects student goals and achievement. P2 interjected "Relationships can have both positive and negative effects on student achievement" and went on to add "we want to develop and build positive relationships that create lifelong learners with our students and our teachers". Principal commitment to caring, effort, and time matters and are important in building effective relationships with teachers that effects planning and instruction that could result in increased student engagement leading to higher academic achievement.

Theme 2: Facilitating High-quality Learning Experiences

Principal's planned and intentional actions can be instrumental in improving student achievement. Through guidance, support, and facilitation of effective instructional strategies, principals play a vital role in ensuring each student has an opportunity to experience high quality learning. P2 strongly believed principals are vital in ensuring teachers have the opportunity to be successful and replied "the main thing we can do to help our teachers teach is to ensure they have all the resources they need to be successful" and "when it comes to the instruction piece, we feel like they must teach to the test. I know that is not a proper term, but if that's what we are going to be graded on that is what we are going to do." P2 is an advocate for teacher's daily instruction use of all the objectives and resources that will be used and assessed on the day of the state Algebra test. For instance, P2 emphasized (in reference to teachers) "they make sure they have the same resources that will be used on the test. What I mean by that is that we are going to be sure we use the Case 21 daily. That Case 21 mirrors the state test and so day in and day out those students are going to be assessed in the same manner and with Chromebooks because they will use them to take the state test."

P1 and P2 are advocates for ongoing walkthroughs in the classroom to monitor student progress, to focus on how leadership looks in the classroom, to monitor how questioning techniques occur in the classroom, and to ensure student instruction is individualized. P1 supports the concept of that "We watch our students and make sure they are successful and if they are not then we pull them two or three times a week." P1 added that as a veteran high school mathematics teacher who had taught Algebra I the

first year the state algebra test was administered by the state and more than a decade consecutively after the first administration, “I am very familiar with the standards and how to teach them and I have on several occasions worked with teachers and students on the standards. Sometimes I pull them myself and sometimes I have other math teachers that pull them and work with them.”

Data guides and drives instruction for both P1 and P2. P2 replied “we are going to look at the data from all the teachers and see if we can find a pattern between the teachers as to why students did not do well on some objectives and/or why students did do well on other objectives. The biggest thing is we are going to let the data guide instruction.” Likewise, P1 replied “for ILPs to help teachers teaching Algebra I, we work a lot with the data and let it guide our decisions about instruction. I make sure all the teachers have the standards they need, scaffolding documents, and how to test that item, and how to interpret data.”

Theme 3: Supporting Building Profession Capacity

Principals intentional actions to ensure teachers have access to professional opportunities to develop relational skills are necessary and can help to create positive instructional and learning environments for students. Building professional capacity in instruction and learning is vital to student success and achievement. According to P2, “the main thing principals can do to help teachers teach is to ensure they have all the resources they need to be successful.” Teachers need to know and should feel that principals support them. P2 suggested that collaboration also plays a major part in

ensuring teachers feel they are supported by “giving teachers parameters so they can put their spin on teaching and instruction and make sure what they are doing is genuine to them and their personalities.” Taking care of discipline problems immediately, according to P2, enables teachers to feel supported and creates an environment for teachers to submerge themselves in concentrating on instruction and meeting individual student needs without the added challenges and distractions associated with dealing with discipline issues.

P1, ensures and displays actions and behavior to let teachers know the door is always open to discuss concerns and issues in teaching and learning. P1 added that (in response to Algebra I teachers) “I work with them individually myself and both teachers and students often come to my office for help with algebra problems.” P1 also adds “sometimes teachers as me to show them or teach their class a concept”.

Advancement of high-quality instruction and student learning with increased academic proficiency and achievement are the overall goals of principals supporting teachers in building professional capacity. According to P2, “everyone can improve at something and regardless of how good you are, how good your scores are, how long you been teaching, every teacher can improve on something.” Principals can exhibit behaviors that builds teacher professional capacity through professional development opportunities relevant to algebra teachers supporting and delivering instruction to meet individual student needs so that algebra proficiency is increased and ultimately student algebra achievement and state Algebra I scores.

Facilitating activities like algebra teachers observing other algebra teacher's instruction and observing other successful schools can help teacher build their professional capacity and in turn help students improve their proficiency in Algebra I. Professional Learning Communities (PLCs) may also be used to build teacher professional capacity. According to P1 their teachers meet together several times throughout the school year in PLCs and meet weekly in common planning periods to "strategically plan vertically and horizontally to meet student academic objectives, goals, and needs". P2 stated support of teachers attending various professional development opportunities, but much more favored teachers observing other teachers and successful schools. According to P2, "we encourage our teachers to visit other successful schools that mirror ours, maybe not in size but that have similar characteristics."

Evidence of Trustworthiness

I used a rigorous approach in conducting research and evaluating data and findings of this basic qualitative research to ensure trustworthiness of the study. During the analysis and interpretation of data, I used participants' direct quotes and member checking to ensure credibility and accuracy of interpretations of data. I provided thick descriptive details in the findings to ensure the likelihood research findings of my study have some meaning beyond this study. To ensure dependability of data over conditions and time, I coded and recoded data from participants interviews. Throughout the research process, I maintained a detailed reflexive journal to verify and check the data to promote transparency and to ensure confirmability.

Summary

Perceptions of the school principals at the high schools under study were that district and school visions and goals be communicated to everyone. ILPs supporting mathematics teachers to help students improve their proficiency in Algebra I involved principals building strong relationships with teachers and students with trust and buy-in as major elements in achieving this goal. Principals, in establishing relationships, helped guide and direct ILPs for teachers and fostered teacher beliefs and feeling that they are supported. Findings of the study revealed communication and high expectations of quality instructions, student engagement, and achievement ensured instructional practices that ultimately lead to teachers effective planning and management of instruction to meet individual student needs. Principal instructional practices focused on establishing routines of high-quality individualized instruction helped in meeting all planned and required educational goals to improved student proficiency in Algebra I.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this research study was to examine the perceptions of school principals at the high schools under study regarding ILPs supporting mathematics teachers to help students improve their proficiency in Algebra I . I conducted this study using a basic qualitative research design to understand perceptions and ILPs of school principals. To create appropriate interview protocol and appropriate interview questions for this study, I used UF. I used purposeful sampling to select appropriate participants for this study. To address and answer the research question, perceptions of school principals at the high schools under study regarding ILPs supporting mathematics teachers to help students improve their proficiency in Algebra I,I u from interview responses.

I createdrview questions based on instructional leadership and collected data from two school principals at high schools using only Zoom recorded interviews. Using dictation software included on a Mac computer, I manually transcribed used member checking for participants to review interview transcripts for validation of accuracy. UFharacteristics of principals' ILPs that influence increased student achievement: (a) establishing and conveying the vision, (b) facilitating high-quality learning experiences for students, (c) building professional capacity, (d) creating a supportive environment for learning, and (e) connecting with external partners. Key findings of the study revealed that principals at the site under study were consistently applying ILPs to support mathematics teachers to help student improve their proficiency in Algebra I.

Interpretation of the Findings

The following themes emerged from collection, analysis, and interpretation of the interview data from school principals: building strong relationships, facilitating high-quality learning experiences, and supporting building professional capacity. I presented excerpts from the interview transcripts to support the findings of the study that aligned with domains of UF. Key concepts of UF are principal instructional leadership and student achievement. Research based ILPs have been shown, when consistently applied, results are positive student proficiency and achievement. Findings of the study indicated that school principals did consistently apply ILPs supporting mathematics teachers for students to improve their proficiency in Algebra I.

Limitations of the Study

The research site, a small public school district, was a limitation of the study. The school district was made up of six schools that served approximately 2,400 students with a student to teacher ratio of 16:1. Of the six schools, two are high schools with one being a junior high and the other a senior high. The study was limited with only two high school principals interviewed for the study. A study with more participants that consisted of both principals and assistant principals could have yielded more robust interview data. With such a small sample, participants could have been reluctant to provide honest responses. Also, a deeper understanding and insight into principal ILPs may have been gained if teachers would have been invited to participate in the study.

Recommendations

I conducted this study with a small school district in Mississippi using a small participant sample of only school principals. Recommendations for further study of this topic is that the same study be conducted with the same or a similar size school district or on a larger school district in Mississippi or other states. The study could also be conducted with a larger participant sample and a sample of both principals and assistant principals.

Implications

The findings of the study may offer principals guidance to support teacher's instructional practices to help students improve their proficiency in Algebra I. Findings promote positive social change through enhanced principal instructional leadership practice to facilitate high-quality learning experiences and create supportive learning environments to increase student algebra proficiency. Recommendations for best principal instructional leadership in support of teachers' daily instructional practices to help students improve proficiency in Algebra I could be made based on data collected for this study. Finding may contribute to positive social change by principals applying ILPs to help teachers assist students with Algebra I proficiency and increasing algebra state scores.

Conclusion

The purpose of this basic qualitative research design was to examine the perceptions of school principals at the high school under study regarding ILPs supporting

mathematics teachers to help students to improve their proficiency in Algebra I. Principal's intentional communication, behaviors, actions, and practices focused on high expectations of high-quality learning experiences, supportive learning environments, and high academic standards for all students is essential in moving individual students proficiency and achievement levels. Findings of the study promote positive social change by principals consistently applying research-based ILPs to support teachers use of instructional practices that help students improve their proficiency in Algebra I that contribute to student success in graduating high school.

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Appendix A: Partner Organization Agreement for AEAL Dissertation

WALDEN UNIVERSITY

A higher degree. A higher purpose.

Partner Organization Agreement
for AEAL Dissertation

Organization Name
Organization Email Address
Organization Phone Number
March 2, 2020

The doctoral student, Tangia Ann Miller, will be conducting a dissertation study as part of the AEAL (Education Administration and Leadership for experienced administrators) EdD program. The student will be completing Walden IRB requirements *and our organization's research approval processes*.

I understand that Walden's IRB has given the student tentative approval to interview leaders (supervisors, board members, PTA leaders, community partners, state department personnel, and similar decision-makers) with whom the student has no power relationship. Details will be created for the final proposal, and the informed consent letter attached will be used. Depending upon the details of the student's study, deidentified organization data* may be requested.

> ****At the discretion of the organization's leadership, the student may analyze deidentified records including: aggregate personnel or student records that have been deidentified before being provided to the doctoral student, other deidentified operational records, teaching materials, deidentified lesson plans, meeting minutes, digital/audio/video recordings created by the organization for its own purposes, training materials, manuals, reports, partnership agreements, questionnaires that were collected under auspices of the partner organization as part of continuous improvement efforts (SIPs, for example), and other internal documents.*

I understand that, as per doctoral program requirements, the student will publish a dissertation in ProQuest as a doctoral capstone (withholding the names of the organization and participating individuals), as per the following ethical standards:

a. The student is required to maintain confidentiality by removing names and key pieces of evidence/data that might disclose an organization's or individual's identity.
b. The student will be responsible for complying with policies and requirements regarding data collection (***including the need for the organization's internal ethics/regulatory approval as applicable***).

c. Via the Interview Consent Form, the student will describe to interviewees how the data will be used in the dissertation study and how all interviewees' privacy will be protected.

I confirm that I am authorized to approve research activities in this setting.

Signed,

Authorization Official Name
Title

This template has been designed by Walden University for the purpose of creating a partnership agreement between an education agency or district/division and a Walden doctoral student in support of that student's dissertation. Walden University will take responsibility for overseeing the data collection and analysis activities described above for the purpose of the student's doctoral dissertation.

Appendix B: Leader Interview Consent Form

To be sent to invited interviewee in the body of an email (not as an attachment):

You are invited to take part in a leader interview for my doctoral dissertation conducted as part of my EdD in Education Administration and Leadership.

Interview Procedures:
If you agree to be part of this study, you will be invited to take part in audio-recorded interviews about the organization's operations and problem-solving needs. Transcriptions of leader interviews will be analyzed as part of the study, along with any archival data, reports, and documents that the organization's leadership deems fit to share. A copy of your interview recording is available upon request. Opportunities for clarifying your statements will be available through processes of transcript review and member checking. Interviews may take an hour, and each review process may take up to 30 minutes.

Voluntary Nature of the Study:
This study is voluntary. If you decide to join the study now, you can still change your mind later.

Risks and Benefits of Being in the Study:
Being in this study would not pose any risks beyond those of typical daily life. My aim is to provide data and insights that could be valuable to this organization and others like it.

Privacy:
Interview recordings and full transcripts will be shared with each interviewee, upon request. Transcripts with identifiers redacted may be shared with my university faculty and my peers in class. Any reports, presentations, or publications related to this study will share general patterns from the data, without sharing the identities of individual participants or partner organizations. The interview transcripts will be kept for at least 5 years, as required by my university.

Contacts and Questions:
I am happy to answer any questions you might have about the study's purpose and steps. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is 612-312-1210. Walden University's ethics approval number for this study is --------. (The IRB will provide the ethics approval number to the student after the proposal has been fully approved).

If you agree to be interviewed as described above, please reply to this email with the words, “I consent.”

Appendix C: Letter for Permission To Conduct Research

Greetings,

My name is Tangia Miller, and I am an Education Administration and Leadership doctoral student at Walden University in Minnesota. The research I wish to conduct for my doctoral dissertation involves perceptions of school principals at high schools regarding their instructional leadership practices to support mathematics teachers to help students to improve their proficiency in Algebra I.

This project will be conducted under the supervision of my Committee Chairperson, Dr. XXX (Walden University, Minnesota); Committee Member, XXX (Walden University, Minnesota), and University Reviewer, XXX (Walden University, Minnesota). I am hereby seeking your consent to approach a number of high school principals for the XXX School District to provide data for my dissertation through individual Zoom interviews that will be approximately 45 minutes. All data collected will be deidentified in my dissertation.

Given the new normal of our country with the Coronavirus, social distancing mandates, and other concerns, Zoom interviews will be the source I utilize to collect the data for my dissertation. I will schedule interviews at the convenience of each individual high school principal volunteer participant. I hope to complete data collection for my dissertation in the next few weeks, before school starts up again in the fall.

I hope you will volunteer to consent to my collecting the data I need for my study in XXX School District. I have attached a copy of the Partnership Organization Agreement that contains more information and requires a signature should I be granted permission to conduct research in the schools. For your convenience the form may be electronically signed or signed and emailed back to my email listed below.

I would appreciate any assistance you may be able to give me concerning this matter. If you require any further information, please do not hesitate to contact me at the phone number and/or email listed below. Thank you for your time and consideration in this matter.

Tangia Miller

Appendix D: Interview Protocol

Interviewer: _____ Date: _____

Interview Start Time: _____ Interview End Time: _____

Good morning/afternoon. Thank you so much for volunteering to participate in this study. The interview process will take approximately 60 minutes. I will be asking questions related to your time as a principal/assistant principal at (the selected school site). The purpose of the interview is to gain understanding related to your perceptions and instructional leadership practices while serving as school principal. Please note, I will be taking notes throughout the interview to allow me to capture important answers and information you share with me. If at any time during the interview you decide to opt out of this study, any data collected will be destroyed.

1. How do you apply your instructional leadership practices in your school?
2. Which instructional leadership practices do you apply to help teachers teaching Algebra I?
3. How do you help teachers teaching Algebra I?
4. How do you apply instructional leadership practices that support teacher's teaching Algebra I?
5. Which leadership practices have you applied to improve state scores in Algebra I?
6. What is your district's intervention strategic Algebra I plan to support teachers teaching Algebra I?

7. How do you use and apply this strategic Algebra I plan?
8. How do Algebra I students benefit from your leadership as an instructional leader?
9. What professional opportunities are available for teachers teaching Algebra I?
10. What do you do to supervise teachers teaching Algebra I?
11. How do you promote professional development specifically for teachers teaching Algebra I?

Is there anything else about your instructional leadership practices you would like to share?

Appendix E: Participant Invitation Letter With Informed Consent

Greetings,

My name is [redacted], [redacted]hip doctoral student at [redacted]. The research I wish to conduct for my doctoral dissertation involves perceptions of school principals at high schools regarding their instructional leadership practices. The purpose of this research is to examine the perceptions of school principals at the high schools under study regarding instructional leadership practices supporting mathematics teachers to help students to improve their proficiency in Algebra I.

You are invited to take part in a leader interview for my doctoral dissertation conducted as part of my EdD in Education Administration and Leadership.

Interview Procedures:
If you agree to be part of this study, you will be invited to take part in audio-recorded interviews about the organization's operations and problem-solving needs. Transcriptions of leader interviews will be analyzed as part of the study, along with any archival data, reports, and documents that the organization's leadership deems fit to share. A copy of your interview recording is available upon request. Opportunities for clarifying your statements will be available through processes of transcript review and member checking. Interviews may take an hour, and each review process may take up to 30 minutes.

Voluntary Nature of the Study:
This study is voluntary. If you decide to join the study now, you can still change your mind later.

Risks and Benefits of Being in the Study:
Being in this study would not pose any risks beyond those of typical daily life. My aim is to provide data and insights that could be valuable to this organization and others like it.

Privacy:
Interview recordings and full transcripts will be shared with each interviewee, upon request. Transcripts with identifiers redacted may be shared with my university faculty and my peers in class. Any reports, presentations, or publications related to this study will share general patterns from the data, without sharing the identities of individual participants or partner organizations. The interview transcripts will be kept for at least 5 years, as required by my university.

Contacts and Questions:
I am happy to answer any questions you might have about the study's purpose and steps. If you want to talk privately about your rights as a participant, you can [redacted] representative who can discuss this with you. [redacted] phone number is [redacted] University's ethics approval number for this study is --------. (The IRB will provide the ethics approval number to the student after the proposal has been fully approved).

If you agree to be interviewed as described above, please reply to this email with the words, "I consent."

Appendix F: Schedule Interview

Thank you for volunteering to participant in this study. The scheduled time for the Zoom interview will be (Day) at (Time) AM/PM. If you do not have Zoom downloaded on your computer, please use the following click on (Link) to download the link prior to interview time. Also, to expedite time during the day of the interview, please complete the following demographic information for the study.

Schedule Interview

Directions: Please check appropriate box to select interview date and time

Date: _____ (Date of Consent) _____ (1 day after Date of Consent)

_____ (2 days after Consent) _____ (3 days after Date of Consent)

_____ (other date)

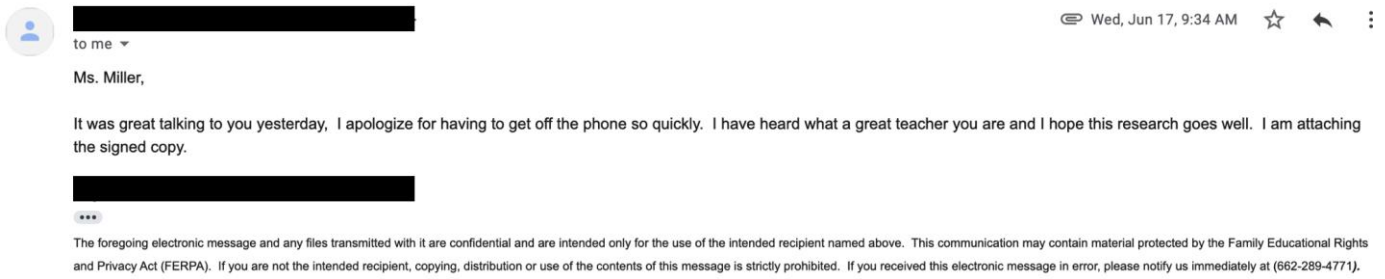
Time: _____ 8 am _____ 9 am _____ 10 am _____ 11 am

_____ 1 pm _____ 2 pm _____ 3 pm _____ 4 pm

_____ 5 pm _____ 6 pm _____ 7 pm _____ 8 pm

_____ other am _____ other pm

Appendix G: Site Superintendent Reply to Site Invitation



[redacted] Wed, Jun 17, 9:34 AM

to me

Ms. Miller,

It was great talking to you yesterday, I apologize for having to get off the phone so quickly. I have heard what a great teacher you are and I hope this research goes well. I am attaching the signed copy.

[redacted]

Appendix H: Superintendent Assistance With Participant Invitation Letter

Greetings _____.

Thank you for your consent to collect the data I need for my study in XXX School District. I need your assistance in inviting potential participants to volunteer to participate in my study. Please review the criteria for participants below and for principals forward a copy of the attached invitation letter to each one individual.

Criteria for participants:

The criteria for a participant for this study will have been a public school high school principal (or assistant principal) at the site district during the school year 2018-2019 (and possible still a principal or assistant principal at the site district or no longer a principal or assistant principal at the site district) and supervised and/or evaluated mathematics teachers' instruction of students who initially took Algebra I and the state algebra test during the school year 2018-2019 study**.**

If you require any further information, please do not hesitate to contact me at the phone number and/or email listed below. Thank you for your time and assistance in this matter.

XXXXXXXXX

XXXXXXXXX

Appendix I: Permission To Conduct Research at Site District

Permission to Conduct Research in the District Inbox ×

Tangia Miller <t[redacted]il.com> Jun 16, 2020, 10:16 AM

to [redacted]

Greetings,

My name is Tangia Miller, and I am an Education Administration and Leadership doctoral student at Walden University in Minnesota. The research I wish to conduct for my doctoral dissertation involves perceptions of school principals at high schools regarding their instructional leadership practices to support mathematics teachers to help students to improve their proficiency in Algebra I.

This project will be conducted under the supervision of my Committee Chairperson, Dr. Jerry Collins (Walden University, Minnesota); Committee Member, Dr. Peter Kiriakidis (Walden University, Minnesota), and University Reviewer, Dr. Nancy Williams (Walden University, Minnesota). I am hereby seeking your consent to approach a number of high school principals [redacted]School District to provide data for my dissertation through individual Zoom interviews that will be approximately 45 minutes. All data collected will be deidentified in my dissertation.

Given the new normal of our country with the Coronavirus, social distancing mandates, and other concerns, Zoom interviews will be the source I utilize to collect the data for my dissertation. I will schedule interviews at the convenience of each individual high school principal volunteer participant. I hope to complete data collection for my dissertation in the next few weeks, before school starts up again in the fall.

I hope you will volunteer to consent to my collecting the data I need for my study in [redacted]
School District. I have attached a copy of the Partnership Organization Agreement that contains more information and requires a signature should I be granted permission to conduct research in the schools. For your convenience the form may be electronically signed or signed and emailed back to my email listed below.

I would appreciate any assistance you may be able to give me concerning this matter. If you require any further information, please do not hesitate to contact me at the phone number and/or email listed below. Thank you for your time and consideration in this matter.