

2020

Elementary Principals' Constraints and Considerations when Hiring and Assigning Mathematics Teachers

Kathleen Schofield
Walden University

Follow this and additional works at: <https://scholarworks.waldenu.edu/dissertations>



Part of the [Science and Mathematics Education Commons](#), and the [Teacher Education and Professional Development Commons](#)

This Dissertation is brought to you for free and open access by the Walden Dissertations and Doctoral Studies Collection at ScholarWorks. It has been accepted for inclusion in Walden Dissertations and Doctoral Studies by an authorized administrator of ScholarWorks. For more information, please contact ScholarWorks@waldenu.edu.

Walden University

College of Education

This is to certify that the doctoral study by

Kathleen Schofield

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee

Dr. Glenn Penny, Committee Chairperson, Education Faculty

Dr. Charles Bindig, Committee Member, Education Faculty

Dr. Paul Englesberg, University Reviewer, Education Faculty

Chief Academic Officer and Provost

Sue Subocz, Ph.D.

Walden University

2020

Abstract

Elementary Principals' Constraints and Considerations when Hiring and Assigning

Mathematics Teachers

by

Kathleen Schofield

MA, University of North Florida, 2008

BA, University of North Florida, 2005

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Administrative Leadership for Teaching and Learning

Walden University

April 2020

Abstract

Quality issues existed in mathematics instruction in elementary classrooms in a region in Florida. As a possible contributor to that problem, principals were hiring and assigning mathematics teachers who may have possessed insufficient content knowledge.

Elementary teachers are frequently teamed in the region, with 1 teacher assigned to provide instruction in mathematics and the other to provide literacy instruction. The purpose of this study was to understand factors elementary school principals considered when hiring and assigning mathematics teachers as well as possible budgetary and other constraints that may have affected the depth of the applicant pool and related staffing decisions. The principals' teaching experience, background, and preparedness to serve as the chief learning officer were also considered. The theoretical framework for this study was the strategic management of human capital in public education developed by Oden and Kelly. A case study was conducted in the qualitative tradition. Data were collected by conducting interviews with a sample of 10 elementary principals from 7 districts in Florida. The data were coded and organized by theme. The findings illustrated inconsistent applications of human capital management practices due to a lack of formal training and experience, as well as a lack of self-efficacy towards mathematics. Further, findings uncovered a variety of constraints beyond those related to budgetary matters. Nonbudgetary constraints presented greater challenges than those related to budgetary matters. A 3-day professional learning experience was developed to deepen principal understandings of human capital management as applied to staffing practices in the context of mathematics. Principals who apply these practices may make better staffing decisions, leading to higher student achievement in mathematics.

Elementary Principals' Constraints and Considerations when Hiring and Assigning

Mathematics Teachers

by

Kathleen Schofield

M.A., University of North Florida, 2008

B.A., University of North Florida, 2005

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Administrative Leadership for Teaching and Learning

Walden University

April 2020

Dedication

Earning a doctoral degree has been one of the greatest achievements of my life, and simultaneously one of the greatest challenges. I have spent hundreds of hours over the past few years reading, writing, and researching. These hours that I spent devoted to my studies were possible due to the understanding of my family and friends. This achievement would not have been possible without the love and support of my beautiful children, Rachael and Matthew, my sister, Dana, and my mom, who believed in me and believe that education should last a lifetime. They understood when I took time away from the time that I spent with them to work on my coursework and my studies with a smile and positive words of encouragement.

I am incredibly proud of both of my children and the contribution that I know they will each make to their field and to social change. As I watch my daughter's career blossom, I am in awe of the person she has become. Her work ethic is impeccable. As she earned her master's degree and continues her education with the pursuit of a doctoral degree, I am struck by her passion and determination. Her passion for addressing the social and emotional needs for her students has made a lasting impact on her school campus. My son is growing into a fine young man, finding his passion in the financial sector, and pursuing his bachelor's degree in finance, and beginning to study computer science, giving him a fintech twist. His passion for learning and for his content is admirable. Further, I admire his commitment to social change and equity through his volunteerism with the nonprofit that I lead. I could not be prouder as he works beside me at student events. As I watch my children learn and grow into amazing adults, I dedicate this work to them. May you never stop learning!

Acknowledgments

It is with all my heart that I thank the many people who have made this doctoral journey possible for me. First, I thank my two beautiful children, Rachael and Matthew. I am so proud of the accomplishments of both of you and the fine young adults that you have become. I deeply thank you both for understanding on all the days when I needed to pull away and write a paper or work on my dissertation.

I also want to thank my friends and my peers who have walked this path before me and who have given me words of encouragement at the moments when I needed them the most. Thanks to Dr. Laylah Bulman, Dr. Cathy Cavanaugh, and Dr. Betina Malhotra. Dr. Jan Bosnick taught me about the deficiencies in elementary mathematics instruction, and gave me the confidence to believe I could do something about it, and led me to develop this passion for mathematics instruction. I especially want to thank my dearest friend, Melissa Wright, who introduced me to Walden University, Tracey Kendrick, who encouraged me to do this work, and my dear friend, Colleen Marini, who has been there each step of the way, encouraging me when I needed a push. And I thank my sister, Dana Zircher, who gave me so many words of support and motivation along the way. There are too many friends to call out by name who have encouraged me and helped me at so many points in this work.

I want to thank Gary Chartrand, author of *Unreasonable Leadership*, and former chair of the State of Florida Board of Education, who taught me to challenge the status quo and to never accept that anything is impossible. Thank you for hiring me, for sharing your vision, and giving me the opportunity to lead this STEM work! I also want to thank

my colleagues at the Florida Department of Education for the collaboration on these important topics.

Beyond all else, I want to thank my committee, Dr. Richard Penny and Dr. Charles Bindig, as well as Dr. Gonzales, my initial committee member representing the URR. Finally, I would like to thank Dr. Paul Englesberg, who came onto my committee as my URR representative, and saw my study through to completion. I thank you all for your professional support and for the questions that you asked me that pushed my thinking. I especially want to thank Dr. Penny. Without his support y, I would not be typing these words. He did not give up on me when I was ready to give up on myself, due to the many challenges that I faced in my life during the latter part of this journey. I am thankful and forever grateful to Dr. Penny for his commitment to my work.

Table of Contents

List of Tables	vii
Section 1: The Problem.....	1
The Local Problem.....	1
Student Achievement	2
Instructional Quality	6
Teachers' Content Knowledge.....	7
Principals' Placement of Teachers in Mathematics Classrooms	8
Gap in Practice	9
Rationale	10
Justification for Problem Choice	10
Supporting Data	10
Purpose of Study	11
Definition of Terms.....	11
Significance of the Study	13
Significance of the Study Problem	13
Research Questions	15
Review of the Literature	15
Conceptual Framework.....	15
Overview of the Process of Searching the Literature	17
Demonstration of Saturation	18
Review of the Broader Problem.....	19
Teachers' Content Knowledge in Elementary Mathematics	26

Instructional Quality in Elementary Mathematics	27
Characteristics of the Hiring Practices that Principals Use	28
Certifications and Qualifications	29
Use of Tools for Selection and Screening.....	29
Principal Autonomy as the Instructional Leader	32
Principal Autonomy and the Interview	33
Implications.....	34
Project Direction	35
Summary	36
Overview of Remaining Sections	37
Section 2: The Methodology.....	39
Research Design and Approach	39
Qualitative Research Design and Approach	39
Relationship of Research Design to the Problem	40
Relationship of Research Design to the Guiding Question	41
Description of the Qualitative Tradition	41
Justification of the Research Design.....	42
Participants.....	43
Criteria for Selection.....	43
Justification for the Number of Participants	44
Procedure for Gaining Access to Participants	44
Establishing Researcher-Participant Relationship	45
Protection of Participants Rights	46

Data Collection	47
Description and Justification of Data to be Collected	47
Justification of Data Chosen for Collection	47
Data Collection Instrument Development	48
Collection Processes	48
Systems for Tracking Data Emerging Understanding	49
Role of the Researcher	49
Experience in the Setting	50
Reducing Potential Bias from Experience in the Setting.....	51
Data Analysis	51
Presentation of the Data	52
Procedure for Addressing Discrepant Cases.....	55
Data Analysis Results	56
Participant Demographics.....	57
Process for Generating, Gathering, and Recording Data.....	57
Framing Data Analysis Through the Research Questions	59
Codes	61
Themes	61
Research Question 1	63
Research Question 2	83
Research Question 3	98
Evidence of Quality of the Data.....	118
Discrepant Cases.....	119

Summary	121
Discussion	121
Conclusions.....	130
Recommendations.....	135
The Need for Professional Development	137
Section 3: The Project.....	139
Introduction.....	139
Rationale	139
Project Genre and Rationale for Professional Development	139
Review of the Literature	140
Professional Development	143
Qualities of Effective Professional Development.....	144
Challenges and Barriers	151
Overcoming the Barriers.....	152
Professional Learning in the Era of the Every Student Succeeds Act	153
Professional Learning Standards.....	154
The Need for Professional Development for Principals	155
Justification for Professional Development for Principals	158
Principal as Learner	160
Principal as Instructional Leader	161
On-Going, Job-Embedded Professional Development for Principals In-	
Service.....	162
Project Description.....	163

Purpose, Goals, Learning Outcomes and Audience.....	163
Project Purpose	163
Project Goal	163
Intended Learning Outcomes	164
Project Audience	165
Project Implementation and Timeline.....	165
Materials Required.....	167
Project Evaluation Plan.....	168
Project Implications	169
Section 4: Reflections and Conclusions.....	171
Project Strengths and Limitations	171
Strengths	171
Limitations	172
Recommendations for Alternative Approaches	173
Scholarship, Project Development, and Leadership and Change	175
Scholarship.....	175
Project Development.....	176
Leadership and Change.....	177
Reflection on the Importance of the Work	178
Implications, Applications, and Directions for Future Research	180
Implications for Positive Social Change.....	180
Applications	180
Directions for Future Research	181

Conclusion	181
References	184
Appendix A: Administrator Professional Learning Experience	205
Appendix B: Project Implementation Timeline	292
Appendix C: Interview Protocol	295

List of Tables

Table 1. Mathematics Achievement by Grade Groupings, for the State Under Study, 2017
Administration3

Table 2. State and Local Funding for the State Under Study4

Table 3. Teacher Compensation Comparison for the State Under Study5

Table 4. Educational Attainment for the State Under Study5

Table 5. Change in Estimated Average Annual Salary of Teachers in Public Schools,
Selected States with Salary Decreases, 1999–2000 School Year Compared to
2016–2017 School Year.....22

Table 6. Change in Estimated Average Annual Salary of Teachers in Public Schools,
Selected States with Salary Increases, 1999–2000 School Year Compared to
2016–2017 School Year.....23

Table 7. Grade Levels Served by Participant59

Table 8. Overview of Codes Organized Into Emergent Themes61

Table 9. Instructional Teaming Structure by School65

Table 10. Professional Development Planning and Implementation Timeline166

Section 1: The Problem

There was an instructional achievement problem in some of the school districts in Florida in the content area of mathematics, as measured by student learning outcome data from the Florida Standards Assessment. Several factors may have contributed to the problem of student achievement in mathematics. Some of those factors included budgetary constraints and prevailing salary scales with regard to teacher pay. However, deficiencies in student achievement were occurring, in part, due to a lack of adequate content knowledge of the teachers. A deficit in content knowledge was an impediment to teachers being able to provide high quality instruction in mathematics (Ottmar, Decker, Cameron, Curby, & Rimm-Kaufman, 2014; Polly et al., 2017). Because school principals were assigning teachers who may have lacked adequate content knowledge in mathematics, principals were potentially contributing to the problem (Liu, Liu, Stronge, & Xu, 2016).

The Local Problem

There were data that supported the existence of an instructional achievement problem in the content area of mathematics in the districts in the bounded case under study; students were not being adequately prepared for success (Florida Department of Education, 2017). This problem is important because math content is essential to many of the critical occupations in the local area, especially computer science (Vice President of Workforce Development personal communication, April 12, 2017). When students are not strong in mathematics, they are less likely to be successful in an introductory computer science class (Kermani & Aldemir, 2015). So that students would have as

many career options opened as possible, it was important that all students have access to instruction in mathematics that is high in quality (Sax, Kanny, Riggers-Piehl, Whang, & Paulson, 2015).

Student Achievement

Many students were not being given adequate preparation in the area of mathematics in elementary schools (Blank, 2013). An analysis of the standards assessment for Florida revealed that only 58% of students in the third through fifth grade levels tested proficient in mathematics in 2016, and only 61% tested proficient in mathematics in 2017 (Florida Department of Education, 2017). Further, only 56% of students in grades six through eight tested proficient in mathematics in 2016, and only 57% tested proficient in mathematics in 2017 (Florida Department of Education, 2017). As students progressed from elementary school to middle school, proficiency, as measured by the state assessment, dropped. The problem continued to worsen as students reached algebra, with only 60% of students achieving proficiency in 2017 in all grades (Florida Department of Education, 2017). Deeper analysis of these data indicate that the 60% statewide proficiency rate breaks down into two categories: students who are accelerated and students who are not accelerated. The accelerated students are those who take algebra in grades four through eight. Overall, the first-time pass rate for this group of students was 88% in 2016 and 89% in 2017 (Florida Department of Education, 2017). Those students who took the algebra assessment in grades nine through 12 had an overall pass rate of only 36% in 2016 and 42% in 2017 (Florida Department of Education, 2016, 2017).

Many students in the bounded case under study did not possess strong content knowledge in mathematics, as evidenced by the result of the Algebra I end-of-course assessment presented above. Those students who take the assessment in ninth grade or beyond begin to be at risk to drop out of high school. These students fall behind in credit hours earned in mathematics and are working to catch up deep gaps in math content while attempting to build upon an already shaky foundation. Table 1, below, shows the progression of math achievement for students by school district as they progress through the grade bands.

Table 1

Region under Study Mathematics Achievement by Grade Groupings, 2017 Administration

District	FSA grades 3–5	All grades 6–8	Algebra I grades 9–12
District 1	68%	54%	54%
District 2	63%	66%	58%
District 3	61%	49%	55%
District 4	65%	65%	55%
District 5	79%	68%	53%
District 6	49%	36%	36%
District 7	81%	80%	66%

There were data to support other factors in the local setting that vary within the districts in the bounded system under study (Florida Department of Education, 2017). This system ranges greatly in performance measures and district rankings in the state (Florida Department of Education, 2017). There are 67 school districts in Florida, and this bounded system contained both the highest ranked district and a district that was nearly the lowest ranked in the state. District 7 was ranked number one in Florida, and

District 6 was ranked 65th out of the 67 school districts (Florida Department of Education, 2017). Table 2 presents the funding levels for each of the districts in the bounded case under study as related to the unweighted full-time enrollment for each of the districts.

Table 2

Region and Local Funding for the State Under Study

District	Unweighted FTE	Per pupil spending	State funding	Total funding
District 1	4,821	\$7,232	30,440,543	34,867,890
District 2	37,033	\$7,137	211,513,115	264,312,200
District 3	129,558	\$7,265	634,298,234	941,306,271
District 4	12,952	\$6,963	46,402,599	90,187,897
District 5	11,851	\$7,301	45,244,892	86,534,818
District 6	10,897	\$7,181	60,533,368	78,259,273
District 7	39,471	\$7,143	156,928,010	281,963,368

Note. FTE = full-time enrollment.

Table 3, below, shows the average salary by district in the bounded case for the region under study. All but two of the districts had an average salary that was below the average salary for the state under study, at \$49,407, and every district had an average salary that was below that of the average salary for the United States, at \$58,950 (National Center for Educational Statistics, 2017).

Table 3

Teacher Compensation Comparison in the Bounded Case in the Region Under Study

District	Average salary	Compared to state under study	Compared to United States
District 1	\$42,692	-\$6,715	-\$16,258
District 2	\$42,693	-\$6,714	-\$16,257
District 3	\$47,219	-\$2,188	-\$11,741
District 4	\$49,657	+\$ 250	-\$9,293
District 5	\$49,506	+\$ 99	-\$9,444
District 6	\$46,265	-\$3,142	-\$12,682
District 7	\$46,707	-\$2,700	-\$12,243

Socioeconomic conditions in the region where the case study took place may have also been a factor that may have influenced the student achievement outcomes in mathematics. Table 4, below, presents data on educational attainment. Educational attainment in District 7, which was the highest performing district in the state under study, was considerably higher than educational attainment in District 6, which was close to the lowest performing county in the state (U.S. Department of Commerce, 2018).

Table 4

Educational Attainment and Poverty Rate in the Bounded Case in the Region Under Study

District	High school graduates	College graduates	Per capita income	Poverty rate
District 1	82.1%	12.6%	\$21,222	17.2%
District 2	90.8%	23.9%	\$27,159	9.6%
District 3	88.9%	28.1%	\$27,235	14.5%
District 4	91.1%	23.3%	\$25,314	11.2%
District 5	90.9%	24.5%	\$31,141	10.3%
District 6	78.4%	12.7%	\$18,561	21.5%
District 7	94.7%	42.5%	\$38,362	7.7%

Instructional Quality

Mathematical concepts build over time, and each new concept relies upon a strong conceptual knowledge of the prior content (Botha, Maree, & Stols, 2013). When the foundation is not strong, misconceptions about mathematical concepts may develop, which may lead to gaps in foundational understandings (Kaput, Carraher, & Blanton, 2017). This achievement problem may be rooted in the quality of mathematical instruction in many elementary schools and may be caused by gaps in the mathematical content knowledge of the teachers assigned to provide instruction in mathematics (Blazar, 2015). When elementary teachers lack content knowledge, the ability of the teacher to identify and remediate mathematical concepts in their students may be limited (Botha et al., 2013). With this limited content knowledge, teachers may be unable to deliver high quality instruction to assure that the needs of their students are met (Botha et al., 2013).

In Florida, many schools have implanted a structure that allowed for team teaching so that one teacher took responsibility for teaching math and science, and the other teacher was responsible for teaching literacy and social studies (school district superintendent, personal communication, June 29, 2018; school district assistant superintendent, personal communication, July 3, 2018). In this setting, each teacher provided instruction in their content area to each of two classes of students (school administrator, personal communication, July 3, 2018; school district math specialist, personal communication, July 4, 2018).

Teachers' Content Knowledge

This assertion that teachers may have lacked content knowledge in mathematics is supported by data. According to publicly available School district data from 2016, a group of 150 elementary teachers in one of the districts in the bounded case were given an assessment to gauge content knowledge in mathematics. The items on the assessment were aligned to mathematical content and the grade level standards that are taught from prekindergarten to the end of the seventh grade. The same data showed that the average score the teachers attained was only 53.3%. These data showed that many of the teachers who were assigned to provide mathematics instruction to elementary students did not have mastery of the content and standards. Further, state and local assessments show that student performance in mathematics was lower than desired. The staffing and assignment of teachers who lacked adequate background may have been contributing to the local problem.

Principals' Placement of Teachers in Mathematics Classrooms

Elementary school principals may have been contributing to the problem due to the teacher placement decisions that were being made for staffing mathematics classrooms. The decision about which teachers should be assigned to teach mathematics is generally made by the school principal (Engel & Finch, 2015). Content knowledge in mathematics became more critical, because the teacher is expected to focus on mathematics instruction (district superintendent, personal communication, June 29, 2018; elementary school principal, personal communication, July 3, 2018). Because there may have been teachers without adequate content knowledge being assigned to teach mathematics, elementary principals may be contributing to the problem of mathematics achievement. Further, many principals lack sufficient background and content knowledge in mathematics, so they may not have been effective in placing mathematics teachers (Steele, Johnson, Otten, Herbel-Eisenmann, & Carver, 2015). In addition, there has been a shift in the role of the principal from a facilities manager to that of the instructional leader, with student learning as the highest priority for the principal (Graczewski, Knudson, & Holtzman, 2009; Williamson & Blackburn, 2016). The current assistant superintendent of curriculum and instruction for one of the districts under study noted that there has been a lack of attention placed on the consideration of content knowledge when principals are making staffing decisions and that many principals may not have sufficient background and preparedness to serve as the instructional leader in mathematics and therefore may not adequately factor content knowledge or mathematical teaching expertise into the decision of who will teach mathematics at each specific grade

level (assistant superintendent, personal communication, March 23, 2017). Because elementary school principals were placing teachers who potentially possessed a deficit in content knowledge in mathematics to teach mathematics, a gap in the practice of school principal regarding teacher placement existed. Because students were underachieving in mathematics, the background and preparedness of the principal as the instructional leader could be relevant and a contributing factor to the problem.

Gap in Practice

The decision about which teachers should be assigned to teach mathematics is generally made by the school principal (Engel & Finch, 2015). Because there may have been teachers without adequate content knowledge being assigned to teach mathematics, elementary principals may be contributing to the problem of mathematics achievement (Blazar, 2015; Engel, 2013). This circumstance created a potential gap in practice in the area of school's human resources and staffing in school administration and in the principal's leadership as the school's chief learning officer.

This situation pertaining to human resource practices in school administration regarding the assignment of teachers who lacked adequate content knowledge in mathematics is not unique to the local setting of this bounded case study. Nationally, there is much to learn about the hiring practices and the preferences principals hold when staffing schools (Engel & Curran, 2016). Further, these hiring practices are important because the process to dismiss ineffective teachers is difficult (Engel, 2013; Engel & Curran, 2016), so these inadequately prepared teachers may remain in their classrooms for a long time.

Rationale

Justification for Problem Choice

There was an instructional achievement problem in the content area of mathematics in the districts under study. Because elementary school principals as the instructional leaders at the school (Williamson & Blackburn, 2016) largely have autonomy in making staffing decisions (Engel & Finch, 2013), they may have been contributing to the problem. Relatively little was known about the process principals use when making hiring decisions (Engel, 2013). This study addressed the local problem by providing insight into the factors that elementary school principals consider when they were making staffing decisions to determine which teachers were given assignments in mathematics. The principals' teaching experience, educational background, and preparedness to serve as the chief learning officer of the elementary school of the participants were also considered. This study may lead to positive social change through improvement in quality of instruction in mathematics.

Supporting Data

As described in the justification of the local problem there were data to support the existence of the problem of teacher assignments to mathematics classrooms based upon assessment of local teachers' content knowledge in mathematics and the results of classroom instruction through the analysis of high stakes state data for the districts in the bounded system under study. Because the average score the teachers attained was only 53.3%, these data provided evidence that some teachers who were assigned to provide mathematics instruction to elementary students did not have mastery of the

content and standards. Further analysis of the data that were presented demonstrated that there was disparity between the varying subgroups reviewed. From this evidence, there was a lack of equity in access to high quality mathematics instruction for all learners. An understanding of the application of human capital management practices may contribute to the development of a potential solution to this problem.

Purpose of Study

In the school setting, human capital management refers to the formalized practices, policies, and strategies related to recruiting and hiring personnel, as well as the systems for developing, compensating, retaining, and managing those personnel (Webb & Norton, 2013). The topic of human capital management is widely studied across the corporate sector and in industry, but there is not as much known about human capital management in the school setting (Engel, 2013). The purpose of this study was to understand factors elementary school principals considered when hiring and assigning mathematics teachers as well as possible budgetary and other constraints that may have affected the depth of the applicant pool and related staffing decisions. I also considered the principals' teaching experience, background, and preparedness to serve as the chief learning officer of the elementary school. Through this study, I have developed a deeper understanding of the consideration that was given to content knowledge and teaching expertise in mathematics when making staffing decisions.

Definition of Terms

Achievement gap: The difference between each subgroup with regard to performance with a local education agency or school and the average for the state

performance of the highest achieving subgroups in mathematics as measured by the assessments required by statute (U.S. Department of Education, 2018).

Conceptual knowledge: Mastery of the core ideas about mathematical structure (Schoenfeld, 2014)

Human capital management: The acquisition and development of teachers and, once on-boarded, the maintenance, management, and retention of the talent in the nation's schools (Odden & Kelly, 2008)

Mathematical knowledge for teaching: Acquired knowledge in mathematics developed by studying the content and the teaching application for the purpose of applying mathematical knowledge in the classroom based upon analyses of pedagogical practice (Ball, Thames, & Phelps, 2008).

Mathematical content knowledge: The profound, deep, and reflective understanding of fundamental mathematics beyond merely being able to make an accurate computation, but to be able to understand and rationalize the conceptual underpinning for the algorithms, requiring both procedural and conceptual elements of topics in elementary mathematics (Ma, 2010).

Pedagogical content knowledge: The ability to understand the correct ways to obtain correct mathematical solutions to a problem with the ability to teach the content as well as the ability to anticipate and remediate student errors (Ma, 2010).

Professional development: Structured professional learning experiences that result in changes in practices and improvements in student learning outcomes (Darling-Hammond, Hyler, & Gardner, 2017).

Strategic human capital management: The strategic management of human capital in carrying out organizational strategies to improve performance and organizational strategy as a basis for a human capital management program design (Becker, Huselid, & Ulrich, 2001).

Recruitment: The process of implementing strategic hiring practices to attract the most highly talented and qualified individuals (Engel & Curran, 2016).

School leadership team: A team that is composed of the principal or other leader of a school, teachers and other applicable instructional stakeholders, other general school employees, parents, students, and other community members that leads the implementation of school improvement measures and other endeavors at the school. (U.S. Department of Education, 2018).

Student performance data: Information about the academic progress of a single student, such as formative and summative assessment data, coursework, instructor observations, information about student engagement and time on task, and similar information (U.S. Department of Education, 2018).

Significance of the Study

Significance of the Study Problem

Principals are the instructional leaders of their schools, and student learning is considered the highest priority (Williamson & Blackburn, 2016). To maximize student learning, the principals are responsible for ensuring that high quality instruction is delivered in all classrooms. The delivery of quality instruction in mathematics is important because students need a solid foundation to build upon (Clarke, Doabler,

Nelson, & Shanley, 2015). Without this strong foundation in pedagogy and content knowledge, it is possible that students may not experience success as they progress through middle and high school mathematics. Quality instruction delivered in an inquiry-based mathematics classroom has an influence on student achievement that is directly connected to instruction (Blazar, 2015). It is difficult, however, to expect a teacher without a strong conceptual underpinning in mathematical content to have the depth of understanding to facilitate an inquiry-based environment. Further, the content knowledge of many elementary math teachers is not strong enough to align the content they were teaching to the depth required to meet the expectations of the new and more rigorous standards and progressions (Sax et al., 2015). In consideration of these factors, it is important to gain a deeper understanding of the human capital management practices that were utilized by principals in the hiring of teachers in the districts under study. This is because principals were largely making the staffing decisions in their schools (see Engel & Curran, 2016). Elementary school principals have a great deal of autonomy in staffing their schools (Engel & Finch, 2015). Through this staffing process, elementary school principals make decisions that affect the quality of instruction in the classrooms (Engel, 2013). In the districts under study, current human capital practices, as well as the preparedness and background of the principal, were potentially leading to the placement of teachers who were assigned to teach mathematical content that they may not be adequately prepared to teach.

Research Questions

The research questions provided an overarching direction that guided the development of the framework for the study. These guiding questions enabled data to be collected to gain an understanding of the important factors that hiring school principals have considered when deciding who has been assigned to teach mathematics. Additionally, the research questions allowed for flexibility to consider other influences, such as the personal experiences of the school principals during their tenure as a classroom teacher and their educational background.

RQ1: What human capital management practices and specific factors do elementary school principals perceive to be important regarding making teaching assignments in mathematics?

RQ2: What were the preparedness, background, and experiences of the elementary school principals regarding both human capital management and math instruction?

RQ3: How do constraints in budget, salary scales, and applicant pools influence the ability of elementary school principals to recruit highly qualified teachers of mathematics to place in mathematics classrooms?

Review of the Literature

Conceptual Framework

The conceptual framework that supported this study was the seminal work of Odden and Kelly (2008) known as the framework for strategic management of human capital in public education. The goal of the strategic management of human capital in

public education framework was to address the effectiveness of teachers and principals in the largest 100 school districts in the country so that improvement in student achievement could be realized (Odden & Kelly, 2008). The framework that was developed for the project focused on two critical areas, which were to (a) identify the most talented individuals for open teaching positions and (b) implement the use of a strategic human resources management process. To implement this framework, and gain the desired performance outcomes, both aspects of the framework must be present in the hiring process.

The strategic management of human capital framework viewed the staffing and placement process for schools and districts through three main areas: (a) talent acquisition, (b) talent development and motivation, and (c) talent retention (Odden & Kelly, 2008). Under each area, subtopics and areas of focus were further broken down into specific and detailed subtopics. Odden and Kelly (2008) delineated these more specific functions as (a) talent acquisition, including recruitment, selection and placement, compensation, professional development, and career opportunities; (b) talent development and motivation, including induction and mentoring, professional development, performance management, and compensation; and (c) talent retention, including induction and mentoring, performance management, job satisfaction, professional development, and compensation. Through the application of the framework, the implementation goal was to improve the classroom experience for students through better instructional quality. The broad outcome from the comprehensive implementation of all three areas of the framework was to strategically place the right people in the right

jobs so that there would be instructional improvement leading to increased performance of teachers and, ultimately, higher learning gains for the students being served (Odden & Kelly, 2008).

This framework related to the study because there was local evidence that showed an instructional achievement problem in the school districts in the bounded case under study in the content area of mathematics. This deficiency in student achievement may have been occurring because the teachers assigned to teach mathematics may not have had the necessary content knowledge in mathematics to provide students with high quality instruction. Because school principals were assigning teachers to provide instruction in mathematics, principals may have been contributing to the problem. The problem under study related to the elements of the framework of strategic human capital management in the focal area of talent acquisition, specifically the areas of recruitment, selection, and placement. The framework provided a lens to look at how implementation of the talent acquisition process leads to strategic hiring practices, improvements in instructional quality, and eventually to the improved performance of teachers and students. By better understanding the talent acquisition process as applied in the local setting, especially in the areas of recruitment, selection, and placement of mathematics teachers, the possible causes of the local gap in practice in this area could be better understood and addressed.

Overview of the Process of Searching the Literature

To complete the literature review, I conducted keyword searches using the internet. I reviewed the abstracts of potentially relevant articles and downloaded those

that I thought would possibly be appropriate to include in my review. I further reviewed these selected articles for alignment to the topic of my study. I identified articles that were pertinent and recorded the key findings. Next, I reviewed the bibliography of the primary articles to look for other related studies that supported the finding of the articles selected for inclusion. Through this process, I also uncovered the names of other researchers publishing studies that might contribute additional information that was relevant to my topic. I conducted keyword searches on these newly discovered authors and on the title of their work. I repeated that process for each of the pivotal articles in my review. This process allowed me to identify other researchers who had published work that would provide further information and additional insights about my topic.

I maintained a manual list of all the additional articles that I was considering for inclusion. Once the list of articles was developed, I located the full text version of the documents using the Walden Library or Google Scholar while logged in to the Walden system. I downloaded each of the articles and reviewed them in greater detail. If the article was relevant, I included the information in my literature review, and if not, I deleted the article from my list. I created a Post-it note for each article containing key findings. Prior to writing, I organized my Post-it notes so that I could sequence the ideas to develop a logical argument.

Demonstration of Saturation

It was important to set a system in place that would allow me to keep track of the literature that I reviewed so that I would know when I have reached the point of saturation. To keep track of these documents, I set up a Word document with each of the

main articles listed in APA format. I highlighted these main articles so that I would know my starting points in the review of the literature. Any articles that I selected for inclusion after the initial screening were listed underneath the primary article. I did this so that I could find patterns from the keyword searches, and so that I could trace back to the original source, if needed. This process allowed me to discover which other scholars were studying and contributing to the knowledge of this body of work. Once the keyword searches began to yield primarily articles and authors whose work I had already considered or were not sufficiently aligned to my research topic, I considered my search to be exhaustive.

Review of the Broader Problem

There is a problem with performance in mathematics as a nation. There is also a problem with teachers' mathematical knowledge. According to The Nation's Report Card (National Center for Educational Statistics, 2015, 2016), the data from this most recent administration of the TIMSS assessment (National Center for Educational Statistics, 2016) revealed that there were no increases in scores for any subgroup when comparing 2015 results with the 2013 results. The data from The Nation's Report Card (National Center for Educational Statistics, 2016) ranked the Florida last in mathematics when compared to the rest of the United States in some areas that were reported based on TIMSS data. Another recent data set that was released was from the most recent administration of the 2017 National Assessment of Educational Progress (National Center for Educational Statistics, 2017). In a state-by-state analysis of the data from the 2017 National Assessment of Educational Progress (National Center for Educational Statistics,

2017), it was noted that many teachers in Florida do not possess a strong foundation in mathematics, and that, since 2003, although fourth graders have made gains in mathematics, there was still a long way to go (Educational Commission of the States, 2018). When the data were disaggregated by race or ethnicity, Hispanic students perform below their white counterparts, and black students perform even lower (Educational Commission of the States, 2018). The same trend prevailed when the data were analyzed by socioeconomic status, and by community type, with students in both rural and urban communities performing almost equally below students in suburban communities (Educational Commission of the States, 2018). Further, the Florida did far worse than other states on the likelihood that eighth graders will had at least one teacher who majored in math (C. von Zastrow, personal communication, 2018), and that only 20% of eighth graders in the Florida has at least one teacher who majored in math. Among low-income students, it was 18 percent and among rural students, 13 percent (C. von Zastrow, personal communication, May 9, 2018). To this end, many students in Florida were not graduating high school college ready in mathematics (Educational Commission of the States, 2018). With 83 percent of the 2017 graduating class taking the SAT, the average, achievement of students in Florida was below the national average, with all subgroups scoring below white students, with the exception of Asian students, who scored the highest (Educational Commission of the States, 2018).

The research questions address the achievement gap illuminated in and discussed by questioning principals about the human capital management practices and factors that were taken into consideration when making teaching assignments in mathematics.

Research question one provided an opportunity for principals to discuss these influential factors through their perspective. In the context of the first question, the principal may express preference towards placing the strongest candidates in the classrooms where the students have the largest gaps in performance, as measured by the state assessments.

Research question two may provide insight into the relationship between the principal's background in mathematics and human capital management and teacher placement decisions that may be made around the needs of socioeconomically disadvantaged and minority students, as a group. The interviews that have been conducted had seen what evidence exists that relates to the principal's background in the decision-making process supporting specific attention to traditionally underperforming subgroups within the available talent pool.

There was less likelihood individuals who possess a degree in mathematics will go into elementary education when factoring salary considerations. A review of the estimated average annual salary of teachers in public schools by state showed an overall 1.6% decrease in salary when using constant dollars based upon the consumer price index (National Center for Educational Statistics, 2017). There were 27 states that reflected a decrease in the average teacher salary from the 1999 – 2000 school year (National Center for Educational Statistics, 2017). During the 1999 – 2000 school year, teacher pay in the Florida ranked 33rd, at an average salary of \$52,636, but by the 2016 – 17 school year, Florida dropped to 35th, at an average salary of \$49,407 (National Center for Educational Statistics, 2017). There were states, in addition to Florida, where teacher salaries were decreasing. Table 5 below synthesizes the average teacher salaries in selected states

where salaries have decreased, like Florida, as compared to the average salary trend in the United States for the given period.

Table 5

Change in Estimated Average Annual Salary of Teachers in Public School, Selected States with Salary Decreases, 1999–2000 School Year Compared to 2016–17 School Year

State	1999– 2000	2016– 2017	Percent change
US Average	\$59,924	\$58,950	-1.6%
Florida	\$52,636	\$49,407	-6.1%
Alabama	\$53,260	\$48,868	-7.1%
Arizona	\$52,894	\$47,403	-10.4%
Colorado	\$54,701	\$46,506	-15.0%
Indiana	\$59,986	\$50,554	-15.7%
North Carolina	\$56,480	\$49,837	-11.8%

As teacher salaries in many states were decreasing, there were many states where teacher salaries were increasing (National Center for Educational Statistics, 2017). Table 6, below, shows selected states where salaries were increasing (National Center for Educational Statistics, 2017). The highest average salary was found in New York with an average salary of \$79,637, and the state with the highest percent of increase was North Dakota, with a 20.6% increase for the given period and an average salary of \$51,618 (National Center for Educational Statistics, 2017). There were states where teacher salaries were increasing. Table 6, below synthesizes the average teacher salaries in selected states where salaries have increased compared to the decrease of salaries in Florida, as compared to the average salary trend in the United States for the given period.

Table 6

Change in Estimated Average Annual Salary of Teachers in Public School, Selected States with Salary Increases, 1999 – 2000 School Year Compared to 2016-17 School Year

State	2009– 2010	2016– 2017	Percent change
U.S. average	\$59,924	\$58,950	-1.6%
Florida	\$52,636	\$49,407	-6.1%
California	\$68,342	\$78,711	15.2%
District of Columbia	\$67,477	\$76,131	12.8%
Massachusetts	\$66,766	\$77,804	16.5%
North Dakota	\$42,804	\$51,618	20.6%
Wyoming	\$48,916	\$58,650	19.9%

Compared to the other states, teacher salaries in Florida fall into the bottom half in ranking (National Center for Educational Statistics, 2017). The average salary for a teacher in the United States was \$58,950, and the average salary for a person with a degree in mathematics in the United States was considerably higher. According to the U.S. Department of Labor, Bureau of Labor Statistics (2018) Occupational Employment Statistics, some of the top entry level jobs for those holding a bachelor's degree in mathematics include

- cryptographer, with an average salary of \$116,476;
- mathematician, with an average salary of \$103,010;
- economist, with an average salary of \$102,490;
- actuary, with an average salary of \$101,560;
- financial planner, with an average salary of \$90,640;
- statistician, with an average salary of \$84,300;

- operation research analyst, with an average salary of \$81,390;
- systems engineer, with an average salary of \$78,719;
- budget analyst, with an average salary of \$75,240;
- accountant, with an average salary of \$69,350.

With the salary differential between that of a teacher and those listed above, and the National Assessment of Educational Progress data described earlier, stating that, in Florida, only 20% of eight graders, 18% of low-income students, and 13% of rural students have had a least one teacher who has a bachelor's degree in mathematics (Senior Policy Analyst, Education Commission of the States, personal communication, May 9, 2018). These data suggest that there may be more attractive career pathways for individuals who possess a degree in mathematics.

In addition to the salary considerations for individuals who have obtained a degree in mathematics and may or may not choose teaching as a career, there were three other areas that may be contributing to the problem of teachers who may lack adequate mathematical content knowledge. These other overarching factors that may be contributing to the problem of teachers who lack appropriate content knowledge being given assignments to teach that content will be considered. These factors will be viewed through a framework of strategic management of human capital in public education.

The areas that have been considered for this review of the literature and viewed through the selected framework were:

- teachers' content knowledge in elementary mathematics;
- instructional quality in elementary mathematics;

- characteristics of principal hiring.

The literature was rich with examples and evidence that documented the level of content knowledge possessed by teachers of mathematics in elementary schools. This level of content knowledge may affect student performance due to lower levels of instructional quality. Elementary principals may be contributing to this problem because their own teaching experiences and human capital management training and strategies may not have adequately prepared these school principals to be instructional leaders in the content areas that they were charged with supervising.

In contrast to the educational setting, the corporate sector places great emphasis on strategic human capital management, which was considered to be one of the most valuable resources for any company (Vomberg, Homburg, & Bornemann, 2015). In fact, in the corporate setting, the role of the chief learning officer, which parallels the role of school principal, was evolving to include serving as the chief talent officer (Phillips, Phillips, & Elkeles, 2016). In the business community, human capital management was an area of deep specialization, with staff devoted to performing critical functions of talent management and recruitment (Chatterjee, 2017). Yet in the education sector, the function of human capital management has been less widely studied. Although there was a small body of literature which has explored the connection between the background of school principals and their teacher placement practices, there has been relatively little attention placed on human capital management in the context of school administration. In fact, as of 2016, there was not a single study that takes a national approach to study the methods used for teacher hiring (Jacob, Rockoff, Taylor, Lindy, & Rosen, 2016). The following

review has been presented in three sections to discuss what we currently know about the condition of teachers' content knowledge in mathematics, instructional quality in mathematics classrooms, and trends in principal hiring practices.

Teachers' Content Knowledge in Elementary Mathematics

To understand the depth and persistence of the problem of teachers' content knowledge in elementary mathematics, an historical look at what was known has set the stage for this study. The topic of teachers' content knowledge in elementary mathematics has been studied for many years. There have been 38 major studies completed prior to 1998, with an additional 68 studies having been conducted during the period from 1998 through 2011, all of which were published in peer reviewed mathematics education journals (Thanheiser et al., 2014). One such study, a seminal study, conducted by Ma (1999, 2010), provided evidence that there was a relationship between the teacher conceptual understanding of key concepts in mathematics and the ability to adequately teach math concepts to elementary students. The work also spoke to the state of mathematics instruction in the United States and served as both an indictment with a call to action and a need to identify and address the prevailing challenges in education, especially elementary school (Coffey, Cox, Hillman, & Chan, 2015; Hill, Schilling, & Ball, 2004). Out of this work, a need arose to connect content knowledge, pedagogical content knowledge, and the effect of this content knowledge in classroom application.

The interest in continuing to study teachers' content knowledge in elementary mathematics remains high. Researchers also continue to study the connection between teachers' content knowledge and instructional achievement. In a mixed methods study,

90 teachers were administered the Teacher Content Knowledge Survey, which assessed teacher knowledge of (a) basic facts and procedures, (b) concepts and connections, and (c) mathematical models and generalizations drawn from those models (Tchoshanov, Cruz, Huereca, Khakirova, & Ibragimova, 2017). Upon completion of the assessment, a correlational analysis was conducted to look for a connection between the teachers' content knowledge and student performance. The results of the analysis suggest that the stronger the teachers' content knowledge in mathematics, the higher the student achievement (Tchoshanov et al., 2017). The study further suggested that teachers' mathematical content knowledge contributes significantly to student performance (Tchoshanov et al., 2017).

Instructional Quality in Elementary Mathematics

Analysis of prior studies led researchers to explore the potential relationship between teacher professional development and the related increases in content knowledge, and how this applied to instructional quality and student learning gains (Gess-Newsome, 2015; National Center for Educational Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education, 2016; Tella, 2017). Tchoshanov et al. (2017) found that there was a connection between student learning gains and the content knowledge possessed by teachers. The instructional quality in the mathematics classroom plays a role in student learning (Blazar, 2015). The matter of the connection between content knowledge and instructional quality became further evident in situations where an intervention had been done to improve teacher content knowledge. There was evidence to support deep content professional development as a

means to improve teacher content knowledge and instructional quality (Carney, Brendefur, Thiede, Hughes, & Sutton, 2016; Garet et al., 2016; Schoenfeld, 2014). In one of these studies, fourth grade teachers from 94 schools in five states participated in 93 hours of mathematics professional development (Schoenfeld, 2014). Upon completion of the professional development, the teachers in the treatment group performed 21 percentile points above than those teachers in the control group (Schoenfeld, 2014). It was important to study mathematics instructional quality through a number of different frameworks so that a more comprehensive understanding can be gained (Charalambous & Praetorius, 2018).

Characteristics of the Hiring Practices that Principals Use

School leadership was the greatest factor that leads to the improvement in student achievement outcomes, next to the quality of instruction in the classroom (Anderson & Reynolds, 2015; Bastian & Henry, 2015; Fuller & Hollingworth, 2014; Leithwood, Louis, Anderson, & Wahlstrom, 2004). School principals were individuals, bringing their own background, experience, dispositions, and skills into each decision that they make (Engel & Cannata, 2015; Engel & Finch, 2015) and as such, each has a style that influences the way that they interact with other people, including those that they were considering hiring or placing in a job. When principals were making hiring and teacher placement decisions, there does not seem to be a consistent model, framework, or protocol that was being implemented with consistency (Engel & Curran, 2016). This lack of consistency and structure in hiring and placement decisions became a problem because the result of the placement decision directly affects instructional quality in the classroom.

In fact, the quality of the classroom teacher was the single factor that has the most significant influence on student success, therefore a single hiring decision that placed an underqualified teacher in a classroom can lead to student underachievement (Goldhaber, Grout, & Huntington-Klein, 2015; Lui, Lui, Stronge, & Xu, 2016; Schumacher, Grigsby, & Vesey, 2015). With that being said, it was important to connect teacher quality with the selection, hiring, and placement of teachers (Grissom, Kalogrides, & Loeb, 2017).

Certifications and Qualifications

Certification and licensure were often the gatekeeper for a teacher candidate to be considered for an interview for a teaching position. Credentialing alone, however, tends to be weakly correlated, at best, with teacher effectiveness (Goldhaber et al., 2015).

Teacher qualifications often follow an alignment to educational coursework completed in college. Teachers who possess certification in a specific content areas, such as mathematics were found to produce students with higher achievement than those who possess a general certification (Goldhaber et al., 2015).

Use of Tools for Selection and Screening

Beyond certification and licensure, there were professionally designed screening tools which facilitated deeper conversations that elicit information beyond the humanistic aspects of teacher selection. Many tools and instruments that were commercially available, however, place an emphasis on the human elements of teacher, with a focus on areas such as empathy, personality, mission, and the ability to develop and build relationships (Schumacher et al., 2015). But overwhelmingly, the interview, although one of the least likely indicators of performance, was the hiring tool that was most widely

used (Grupka, 2015). Currently, when principals hire and place teachers, there was a tendency to rely on humanistic factors, such as likeability, for the fit of the teacher into the school, and principals were over relying on their own intuition when making staffing decisions (Schumacher et al., 2015).

Some tools that have been developed bring in aspects beyond the human factors. There have been several instruments, checklists, and rubrics developed to help school principals gain a deeper understanding of important criteria when hiring and placing teachers, and these tools were designed to help instructional leaders ask the right questions. The qualities of effective teachers and teacher quality index provided a framework for bringing together the different individual aspects of a candidate for an instructional position and can be viewed through the interview process. This indicator was broken down into six domains which address the qualities of effective teaching: adequate evidence of preparation for effective teaching, personal qualities, skills in the management of the classroom, ability to plan for instruction, ability to deliver instruction and knowledge of assessment (Stronge, 2018).

When viewed through the lens of the qualities of effective teachers and teacher quality index, the first domain was considered for purposes of this study. The qualifications aligned with this domain, as noted as prerequisites for effective teaching include (a) ability to communicate verbally, (b) knowledge of content, (c) knowledge of pedagogy for teaching and learning, (d) certification status, and (e) teaching experience (Stronge, 2018; Stronge & Hindman, 2006). Verbal ability referred to the way that teachers use words and actions to communicate with their students, as was critical to the

content being communicated in a comprehensible manner (Stronge, 2018). Content knowledge, in the context of mathematics referred to the level of profound understanding that was processed as a fundamental mathematical understanding which must be both conceptual and procedural (Ma, 2010; Stronge, 2018). The area of educational coursework presents the understanding that the greater specific subject matter courses have been taken by the teacher was a stronger indicator than grade point average as a predictor of student achievement (Goldhaber, et al., 2015).

There was another model that frames leadership decisions around principal hiring by comparing the relationship between hiring and staffing decisions with the alignment to the mission and vision of the organization (Engel & Curran, 2016). This model was applied in a 2015 study that included 31 principals to see the extent to which evidence of any strategic alignment to the mission and vision of the district throughout the interview and hiring process was present (Engel & Curran, 2016). The findings showed that the hiring practices being utilized by the principals under study were not aligned with the district strategic practices for hiring (Cannata et al., 2017; Engel & Curran, 2016).

As the nation and the states move towards an educational system fostering local control, human capital management practices gained considerable importance as local decisions concerning the placement of teachers became less bound by state policies. A study was conducted in New Orleans School System, post-Katrina, to discover the hiring practices of school principals during this time of deep decentralization, privatization, and school choice initiatives (Jabbar, 2017). In this study, 94 educational leaders from various levels, including principals, district administrators, and leaders of charter school networks

(Jabbar, 2017) were interviewed. The researchers explored (a) what teacher qualities school leaders seek; (b) what strategies leaders use to attract teachers; and (c) what factors support or inhibit teacher hiring, through the perspective of the leader. The findings revealed that experience, instructional skills, receptiveness to feedback, willingness to go the extra mile and to work with troubled populations were considered the most important characteristic (Jabbar, 2017).

Although frameworks and rubrics work to identify specific qualities and factors that define aspects of instructional quality, it was important to remember that effectiveness indicators cannot be viewed in isolation because high quality teaching represents a composite of skills that were represented by a person (Stronge, 2018). The studies conducted by Cannata (Cannata et al., 2017), Engel and Curran (2016), and Jabbar (2017) suggested that principals continued to primarily consider humanistic factors to be the amongst most important when hiring and placing teachers, rather than other factors which may be a better predictor in classroom instructional quality and student achievement. (Cannata et al., 2017; Engel & Curran, 2016; Jabbar, 2017).

Principal Autonomy as the Instructional Leader

The role of the principal has changed over time, and responsibilities have increased (Fullan, 2018). Principals were once primarily responsible for safety, building management, and running a school smoothly, community and family relationships, and the development and maintenance of school culture and student discipline (Fullan, 2018). With the recent adoption of new standards, the role of the principal has grown to include instructional leadership and instructional improvement (Fullan, 2018). School principals

were considered the instructional leader or chief learning officer at their schools, and as such, student learning should be their top priority (Fullan, 2018; Williamson & Blackburn, 2016). To this end, the principal was expected to lead learning and implement the curriculum (Fullan, 2018). It has been demonstrated that instructional leadership was critical to moving mathematics achievement in secondary schools, but frequently principals do not possess adequate preparedness in the form of content knowledge and pedagogical expertise that may be required to perform effectively (Steele et al., 2015; Stein & Nelson, 2003). It was possible that that inadequate state of principal content knowledge in mathematics that has been observed at the secondary level may also apply in the elementary school setting. To effectively perform the instructional leadership role, principals must assure the right people were placed into the classroom to assure high quality instruction (Dhuey & Smith, 2014). These trends in learning leadership were mirroring trends in the business sector. As seen in the business sector, changing leadership roles require that the chief learning officers responsibilities include the acquisition talent (Phillips et al., 2016). This trend in talent management was occurring in education due to the high amount of autonomy principals have in the hiring process (Fullan, 2018).

Principal Autonomy and the Interview

Overall, principals in the United States had a great deal of autonomy over the hiring of teachers on their campuses (Cannata & Engel, 2012; Fullan, 2018). There were different formats and structures in which the candidate interview has taken place. In most cases, the principal makes the decision about the structure and the format of the interview

(Engel & Curran, 2016). Teacher candidates may be interviewed by an individual, such as the school principal, in a group setting with members of the school leadership team. In cases where the leadership team takes part in the decision, a distributed leadership model may be present in the school. The notion of shared, or distributed leadership was a key component and influential concept in school leadership and evidence has been shown that student learning gains were high in a distributed leadership environment (Harris, 2014). In this case, members of the interview team may represent a grade level or a subject area within the school.

The method of leadership and organizational management that a principal utilizes plays a crucial part in the quality of instruction in the classroom. One of the most pivotal administrative roles that a principal was responsible for was to influence instructional quality was teacher hiring and placement (Cannata et al., 2017; Engel, Cannata, & Curran, 2018). There were several models of leadership practices and pathways that potentially influenced student learning,

Implications

There was evidence that indicated the majority of principals in the United States had autonomy over the hiring of teachers on their campuses (Cannata & Engel, 2012; Cannata et al., 2017; Fullan, 2018), so it was important to better understand what was occurring currently. Instructional quality directly affected the outcomes for the students in the classroom (Dhuey & Smith, 2014). Because hiring and placement decisions that principals made were critical to instructional quality and ultimately to student success, it was important to understand what was happening in practice. Yet, relatively little

research has been conducted about principals' hiring practices (Engel & Curran, 2016).

The literature suggests that there was not systematic use of a framework that assures that all aspects of teacher quality are considered, especially in the area of mathematics.

Project Direction

The literature was rich with examples of principal hiring practices that place an emphasis on the humanistic characteristics of individuals who were under consideration for teaching positions. In addition, there was little evidence that the level of teachers' content knowledge in mathematics was an important consideration for principals as they were making hiring and staffing decisions. There was a need for an indicator that would signal hiring principals that a candidate was highly qualified to provide instruction in mathematics. A credential, such as a mathematics endorsement that could be added to the teaching certificate could be established to signal the hiring principal that adequate content knowledge was present. Due to the lack of evidence of a framework that was implemented widely, principals may benefit from a professional learning experience to deepen knowledge about human capital management strategies and frameworks that are utilized in the corporate setting. In addition, because there was a great deal of local autonomy at the school level for hiring and assigning teachers, a professional learning experience to share best practices could be needed to address a possible gap in practice.

Based on the review of the literature and the local problem, there was a clear need for professional development. As such, a 3-day professional learning experience for elementary school principals and district leaders to provide an overview of human

capital management in the context of hiring and assigning teachers to mathematics classrooms could be created. The professional learning experience would take the form of an initial 3-day experience followed up by job embedded learning and collaboration that will be sustained over time.

Summary

The key points illustrated in this proposal include documentation of the problem that my research had addressed. First, there was a problem with student learning outcomes which may have been caused by the quality of mathematics instruction in the bounded case in the region of Florida under study, and elementary school principals may have been contributing to the problem. Elementary school principals in the bounded case under study may not be giving adequate consideration to the mathematical expertise that teacher candidates possess when considering those teachers for placement into a mathematics classroom.

Next, there was evidence of the problem. There were local data which presented evidence that student achievement in mathematics was not as high as desired. Further, there were studies that have shown a connection between instructional quality in mathematics and the depth of understanding of the content of the classroom teacher. The literature was rich with examples showing that teacher content knowledge in mathematics tends to be weak. Further, studies have shown promise for student learning gains to increase when teachers who were strong in mathematics were teaching mathematics to students.

To bring the study together, there was a theoretical framework that ties the pieces of content knowledge, instructional quality, and human capital management together. The strategic management of human capital in public education was based upon best practices in the corporate sector with a specific application to the education sector. The framework focused on three main areas: talent acquisition, talent development and motivation, and talent retention. This study has been viewed through the lens of the first part of the framework, talent acquisition, especially as it applied to the recruitment, the selection and the placement of teachers.

Finally, a presentation of the tentative direction for my project was briefly described. This project addressed a possible solution for elementary school principals to know how to identify teachers who were highly qualified to provide instruction in mathematics.

Overview of Remaining Sections

The following sections address the methodology that has been used to research my problem. The chosen method was from the qualitative tradition. A case study approach has been described. The case study has taken place within the a region of a Southern state, a bounded case. The data for collection are described, as well as the method for collecting data from the participants. The data analysis procedures and protocols were defined. Further, the role of the researcher, and the application of and adherence to all research protocols as required by the Institutional Review Board were discussed.

Following the methodology, analysis of the data were presented. Data are presented in a table populated by codes and grouped by themes. In the data analysis section, each theme was discussed and analyzed to identify patterns, similarities and differences in the data. This discussion was supported by quotes from the participants which provides the basis for the discussion' Discrepant cases are discussed, as well.

After the data analysis and discussion are presented, a literature review is presented to justify the development of a project to which could potentially help close the identified gap in practice' The project was described in detail, followed by the final section that contains reflections and conclusions drawn from the data from the study'

Section 2: The Methodology

Research Design and Approach

The methodology section provided a framework for the approach and research design that was used for this project study through a discussion of the relationship of the research questions to the problem. Additionally, this section provided a roadmap for the implementation of the study with an overview of the nature of the selection of the participants and the means used to assure ethical treatment of the participants. Further, in this section I discussed methods of data collection and analysis.

The research questions that were studied were:

RQ1: What human capital management practices and specific factors do elementary school principals perceive to be important regarding making teaching assignments in mathematics?

RQ2: What were the preparedness, background, and experiences of the elementary principals regarding both human capital management and math instruction?

RQ3: How do constraints in budget, salary scales, and applicant pools influence the ability of the elementary school principals to recruit highly qualified teachers of mathematics to place in mathematics classrooms?

Qualitative Research Design and Approach

The study was based on the qualitative paradigm to develop insight into the factors that elementary principals perceive to be important when assigning mathematics teachers in the bounded system. Qualitative inquiry in the educational setting can allow

for the development of an understanding of what was actually happening in the school and classroom environments (Eisner, 2017). By listening to the concrete experiences of individuals, researchers can begin to develop an understanding of the complex social and educational issues through the lens of those experiencing the phenomena (Seidman, 2013). A case study is most appropriate when used to examine bounded systems (Stake, 2010). I used a case study because this approach allows for insight to be gained about a broad issue with a structure suitable for comparisons across the cases to occur (Lodico, Spaulding, & Voegtler, 2010; Stake, 1995, 2010). For the current study, I examined a bounded system of school districts as defined by the Council of Economic Development (2018). This bounded system included seven school districts in a Southern state. I made comparisons among the districts that make up the bounded system. These comparisons allowed for a greater understanding of the commonalities that occur throughout the bounded system, as well as the differences in each individual situation.

Relationship of Research Design to the Problem

The case study method was appropriate for this study because the overarching purpose was to learn factors that elementary principals considered important when they were making placement decisions about teachers who will provide instruction in the content area of mathematics in elementary schools. I considered the principals' teaching experience, background, and preparedness to serve as the chief learning officer of the elementary school. The qualitative tradition provides a solid framework for a study of this type, because the nature of the project was the exploration of the teacher placement process. I accomplished this through the lens of a systematic inquiry into the perspective

of each of the principals in the bounded system under study. The case study approach helped guide the development of a general understanding of the topic.

Relationship of Research Design to the Guiding Question

The research design for this study was ideally suited for addressing the research questions. The relationship existed because the research design supported open ended questions that helped uncover the possible factors elementary school principals perceived to be important about making teaching assignments in mathematics. The questions also delved into potential contextual and experiential factors that existed and how these factors may have had an indirect or unstated influence on the principals' placement decisions. Therefore, this qualitative study may have provided insights that helped to develop a deeper understanding about the assignment of elementary mathematics teachers from the perspective of the elementary principal. The qualitative approach allowed for data to be collected that may help the local education community better understand the phenomena under study by learning about the experiences these principals go through when making decisions about teacher assignments. I interpreted and generalized these data across their multiple voices and presented through a narrative describing the individual and collective experiences of the principals (see Creswell, 2012; Merriam, 2009).

Description of the Qualitative Tradition

I employed the qualitative research tradition of a case study for this project study. Qualitative research places focus on how individuals approach a specific problem so that a deeper understanding can be gained (Creswell, 2012; Stake, 1995) instead of taking an

approach with a goal of determining cause and effect or of predicting the likelihood of a certain future outcome (Merriam, 2009).

Justification of the Research Design

This study focused on the factors principals in the districts under study considered when making teacher placement decisions, with the goal of understanding the perspective that each participant experienced and what influence, if any, the background of the participant brought to the decision-making process. In general, research may be conducted using quantitative, qualitative, or mixed methods approaches. When making the decision about which type of research to engage in, the nature of the problem and the desired outcomes from the project must be considered. Quantitative research is intended to provide a framework to deductively reason about a set of data that are numerical in nature and lend themselves to statistical analysis, leading to the rejection or acceptance of a hypothesis based on a review of the literature and current theory (Lodico et al., 2010). Qualitative research methodologies provide a framework that supports inductive reasoning and relies on observation and reflection to analyze narrative data and make assumptions based upon patterns or themes (Lodico et al., 2010). Qualitative research places emphasis on gaining meaning and understanding about a particular phenomenon or experience in a context where the researcher serves as the catalyst for collection and interpretation and analysis of the data utilizing an inductive process to develop a rich description of the topic under study (Merriam, 2009). Qualitative research may take one of several approaches, including case study, ethnographic research, phenomenological

research, narrative research, and grounded theory. Each of these qualitative approaches were considered for this project study.

Because the purpose of this study was to understand factors elementary school principals considered when hiring and assigning mathematics teachers as well as possible budgetary and other constraints that may have affected the depth of the applicant pool and related staffing decisions, I determined the case study to be the most appropriate method. This case study approach allowed the narrative to be told to summarize the experiences that the participants had in the decision-making process and to see if there were potential connections to the content background that the participant possessed.

Participants

Criteria for Selection

This study was limited to seven school districts in Florida. Elementary school principals working within the bounded system served as the participants for this study. Elementary school principals were the most appropriate stakeholder source to include in the study because the principals were the individuals tasked with making teaching assignments. The elementary school principals selected for interview were from schools within the geographic boundaries of the case and represented the diverse nature of the bounded system. One or two elementary school principals from each school district were included in the study.

I used typical sampling, a form of purposeful sampling, following the Creswell (2012) model. Purposeful sampling allowed for the intentional selection of participants meeting the criteria for inclusion in the study. Elementary school principals selected for

participation were “information rich” (see Creswell, 2012) and worked in a setting on a school campus where departmentalization or team teaching took place. I incorporated maximum variation strategies so that trends across districts with different demographics and achievement levels could be compared and considered.

Justification for the Number of Participants

A sample of 10 elementary school principals was invited to participate in the study. In this qualitative research study, interviews continued until the point where no new information was being discovered, and there was a sense of completeness and closure to the conceptual information that had been gathered (Sherman & Webb, 2001). There are no set standards for the minimum number of participants required to reach saturation (Guest, Bunce, & Johnson, 2006; Lodico et al., 2010); saturation may occur in as few as eight interviews (Guest et al., 2006). In the case of this study, saturation was reached when 10 interviews were conducted.

Procedure for Gaining Access to Participants

Upon approval of the study, I acquired a list of email addresses for the elementary school principals in each of the seven districts under study by using publicly available information on the school and district websites. I developed a list of schools within the each of the districts noting the grade levels that were served by each school, as well as the departmentalization structure for each school. Once I developed that list, I selected individual principals from the list and invited them to participate in the study. To make initial contact, I emailed each of the potential participants, detailing the study, inviting their participation, and providing them with a copy of the informed consent. I collected

the responses from the invited principals, reviewed that the informed consent response was provided, and then schedule the interviews.

Establishing Researcher-Participant Relationship

A respectful and close relationship with the participants facilitated an environment that lent itself to open and honest communication and set a tone of trust between the participant and the researcher (Merriam, 2009). To develop this relationship, each interview took place at a time that was convenient for the participant, in a neutral setting, and scheduled in advance. The time commitment for the participant was stated in advance so that the participant was able to allocate the appropriate amount of time for the interview. Further, the scheduled amount of time was honored in all cases, and in the event that the interview was not completed in the allotted time, I would have requested express permission to continue past the planned time that was requested.

I began each interview by introducing myself and explain my interest in the phenomena. I reminded the participants that their participation was voluntary, and participants were free to stop the interview and leave at any time. Further, I assured the participant that all responses would be treated confidentially. Before starting the formal interview questions, I casually chatted with the participant with light and friendly general conversation.

At the end of the interview, the participant was be asked if there is anything that may have been omitted and was given the opportunity to clarify any statements made. I also inquired to see if there is anything that I did not ask about that the participant considered to be relevant to the topic. I ended each interview by thanking the participants,

and I asked all of the participants if they would be interested in participating in member checking.

Protection of Participants Rights

Protection from harm. Research comes with the risk of harm. Institutional Review Board (IRB) guidelines were followed, with data collection beginning after IRB approval was obtained (IRB approval number 02-15-19-0556266). In addition to following IRB guidelines, I took the National Institute of Health (NIH) Office of Extramural Research web-based training course, “Protecting Human Research Participants”, and earned the Certificate of Completion (Certification Number 2102104). To protect participants from possible harm, appropriate measures were taken. The areas to be considered include confidentiality, informed consent, and reminding participants that their participation was voluntary and that they may withdraw from the study at any time.

Confidentiality. Confidentiality was maintained throughout the study through the use of a deidentification system. Participants were assigned a numerical code. All documents contained only the identification code. Data collected was stored on a password protected computer, and any hard copies of notes and transcripts were secured in a locked filing cabinet. The list matching the name of the participant with the code was also stored in the locked filing cabinet. Additionally, as the narrative developed, confidentially was further protected by generalizing the demographic data about the schools where the participating principal worked. In this way, it was less likely that the

reader would be able to use deductive reasoning to identify the participant. (Kaiser, 2009).

Informed consent. Informed consent was obtained by email from each participant prior the interview taking place. The informed consent form advised the participant of the purpose of the study, any potential risks for participation, the time commitment involved, that their confidentiality was protected, and that they had the right to withdraw from the study at any time without any repercussions.

Data Collection

Description and Justification of Data to be Collected

Qualitative data were collected for this study through interviews. These data were collected by interviewing elementary school principals in the districts under study. Data were collected throughout the interview process that allowed me to construct a rich, thick narrative as I synthesized the data from the interviews. The collection of data through an open-ended interview protocol provided adequate data and examples to analyze and draw upon. Throughout the interview process, I was able to have flexibility in the data that I collected because I asked probing questions, when appropriate, and I was also able to obtain more in-depth and detailed information.

Justification of Data Chosen for Collection

Data were collected through an interview protocol because the interview provided a way for me to learn about the experiences that the individuals in the system under study have practiced (Lodico et al., 2010). This interview process helped me learn about the things that principals considered to be important when considering the

process of hiring and placing teachers in greater detail, and to see variations in practice across the region. This approach allowed me to find common elements about the practices that principals were utilizing, as well as differences in considerations and practices.

Data Collection Instrument Development

The primary instrument for data collection was an interview protocol, included in Appendix B, that I created and used as the guiding protocol to collect data. The interview protocol was designed to flow in a way that gathered information about the education, career path, and background of the participant, to the specific attributes considered to be important when placing mathematics teachers. Most of the questions for these interviews were open-ended so that the participant would be able to elaborate and express their point of view without being led to a particular way of thinking (Lodico et al., 2010). During the development of the instrument, I sought feedback by asking several of my peers to review the protocol and make recommendations for improvement. After receiving peer feedback and making modifications, I presented my protocol to my committee for review. I then made the final adjustments to my protocol.

Collection Processes

I conducted interviews with each of the participants using the instrument with 17 interview questions that I have developed. This interview protocol was followed for each interview. I collected data through one-on-one in person interviews with the selected school principals from a variety of areas in the bounded case under study. Each interview was conducted in a neutral setting that was convenient for the participant, such as a

private meeting room in a library or coffee shop local to the participant, so that the participant felt relaxed and comfortable (see Lodico et al., 2010). Each interview lasted less than one hour. During each interview, I followed the semi-structured interview protocol, which left me opportunities to probe the participants by asking follow-up questions as needed. Further, the use of these open-ended questions helped to eliminate or minimize researcher bias (Hatch, 2013). The interviews were audio recorded with the permission of the participant and each interview was transcribed.

Systems for Tracking Data Emerging Understanding

Data analysis was conducted for each interview as it occurred, rather than waiting to complete all interviews. Data were grouped into broad topics or categories. As each new interview was analyzed, those data were added to the existing categories, and if data emerged that did not fit into a currently developed category, a new category was added. These new categories were developed as the data were collected and reviewed, so that new and possibly unexpected understandings were able to be identified. These data led to identification of two discrepant cases and were indicative of new understandings about the considerations made by elementary school principals when hiring and assigning teachers.

Role of the Researcher

Currently, I work for a nonprofit entity, the Regional STEM2 Hub. In this capacity, I provide a supporting role to the seven districts under study. I serve as a catalyst of change, by identifying missing elements in the educational setting, working to develop, align, and seek funding for the districts. I work in policy and advocacy to bring

resources to districts, and to try and assure that state statute aligns with the desired outcomes along the STEM learning continuum. I have no direct supervisory relationship with any individuals employed by any of the systems under study.

My work is funded by local corporations with an interest in the talent pipeline that is being developed in the local school systems. Each of the funding entities hold a seat on the board of the company that I am employed by. In addition, all superintendents in the seven-county region, as well as the college presidents serving students within the bounded system, also hold advisory seats on the board.

Experience in the Setting

I have worked in the educational setting for approximately 15 years. I worked as an elementary teacher in a departmentalized setting. I was responsible for teaching math and science, and also as an adjunct professor, teaching math methods for elementary teachers at a university which serves my region. This university is currently providing most of the preservice teacher-education graduates to the schools within the bounded system. I left the classroom and moved to the district office in one of the districts under study where I worked as a curriculum specialist and a district administrator. During my work with both preservice teachers, interning teachers under my supervision, and with practicing classroom teachers, I developed an understanding of the struggles with teaching mathematics in the elementary setting. I observed lessons during which I witnessed math content being taught incorrectly, as well as situations where student misconceptions were permitted to go unresolved. Resulting from these issues with

instruction, student growth, as measured by state assessments, was not maintained at an appropriate rate.

Reducing Potential Bias from Experience in the Setting

Through my experience across multiple settings, as a teacher, a district administrator, and at the university level, I have developed a bias that elementary teachers were weak in mathematics content. Being aware of my disposition towards this belief, I developed interview questions from a neutral point of view. These interview questions had deliberately been structured in this way to minimize the effect of any bias about teachers' content knowledge that I may bring into the setting. Further, the open-ended nature of the questions allowed participants to discuss anything else that they wish to share on the topic, or to add information to any prior question.

Data Analysis

The overarching goal of data analysis is to make sense of the data (Merriam, 2009). To analyze the data, broad categories or themes, were developed. This was accomplished by studying the emergence of patterns. After each interview, the data were analyzed from the transcribed document. An audio taping of each interview was conducted utilizing the voice recording app on a tablet computer. The use of this technology avoided the need for manual note taking during the interviews and thanks to innovative technology, it was not necessary to manually transcribe the data. Through the artificial intelligence app, Trint, each recording was uploaded to the app through a secure file that was password protected to maintain confidentiality. The completed transcriptions became available and was exported to a word processing document. Once the transcript

was opened in Word, it was reviewed by reading for accuracy while listening to the recording. Any transcription errors were corrected. This process was repeated for each interview. This facilitated the coding process. The transcript served as the instrument for analysis and coding of the data. Many topics or categories emerged as the data were analyzed, but through the coding process, the codes were organized into overarching themes were narrowed and consolidated following the method established by Creswell (2012) and Hatch (2013),

Presentation of the Data

Coding procedures. Analysis of the data was conducted on an ongoing basis, as each interview is conducted. Through this process, the data were reviewed, and the interview questions were refined to include probing and follow up questions as themes and patterns in the data began to emerge. The data that emerged from the interviews were quite complex, so it was necessary to organize the data around a framework. Using a topological approach (Hatch, 2013), I developed a matrix manually, using the categories that emerged from the first interview. As each new interview was conducted, I followed the transcription process, reviewed and reread the data several times, and then proceeded to code the data. I organized the new data by placing the evidence into the broad topic where the idea best aligned. In the cases where a piece of data did not fit into an existing group, I set that data aside for further consideration. I used a color-coded system to organize the key points that were made by each participant as I read the data, then generalized the key points into a short phrase which I wrote on a sticky note. I then placed each statement into the matrix, which I kept displayed on larger sticky notes. I

looked for patterns and themes to emerge from the data and found places where I collapsed data that were similar. I also found places where there were enough data points for a new topic to emerge. When data could not fit into the structure, additional categories were created. When an additional category was created, I reviewed the other data points to look for patterns and realigned the data to include the new categories.

After nine interviews were conducted, there was no new information or novel ideas being revealed, therefore saturation had been reached (see Randolph, 2009). I conducted one additional interview, however, out of respect of the additional participant who wished to participate in the study, especially because the interview was already scheduled. I conducted the interview, transcribed and coded the data, then completed the analysis, which validated saturation being reached (see Randolph, 2009) as no new information was derived from this interview. At that point, the interviews were concluded, all data were analyzed, and coded, and initial themes were developed. I reviewed each transcript once again to look for anything substantial that I may have missed. Then I reviewed all the data as they were displayed in the matrix, and I was able to consolidate the initial number of themes by eliminating overlapping or redundant groupings (see Creswell, 2012). I developed those data into concise themes and organized them into a table displaying the themes based on broad generalization of the codes in each category.

Evidence of quality of the data. The interview protocol provided the framework for the collection of the data that was used for this project study. Because the interview questions would be used to collect the data, I collaborated on the development of the

instrument. I spoke with peers in my professional setting to discover what kind of things they would want to know if they were studying this topic, I drafted my questions, and presented them to colleagues for input. I then accepted feedback from my committee chair and second member. I incorporated their feedback to finalize the interview protocol.

Once the data were coded and I began to write the narrative, I highlighted the most pertinent statements made by the participant to support serve as evidence to the narrative. The quotes provided me with data that I was able to draw upon as I constructed rich, thick descriptions of the experiences shared by the participants. I minimized the influence of personal bias by using the established protocols of member checking and peer debriefing. I acknowledged any personal bias through this process. This process helped to assure that my personal bias regarding the topic was not inserted into the narrative.

Protocols to assure data quality. To mitigate the possible influence of any bias that surfaced during the narrative writing, member checks were conducted. A selected representation of the study participants were asked to review the results and conclusions of the study. This process aided in the validity of the story and minimized bias in the narrative. I invited a colleague who served as a thought partner while I was developing thoughts and assumptions. This individual reviewed interview transcriptions and commented about the meaning that I drew from the data. The strategy of peer debriefing challenged my assumptions and helped stretch my thinking about the data. By collaborating with a knowledgeable peer, I was able to look at the data from another perspective.

People develop biases based on their personal experiences and background knowledge, so to minimize my personal bias I reflected on my own practice, conducted member checking, and peer debriefing. Reflecting on my practice allowed me to consider my own experiences with the hiring and placement of teachers, and what I considered to be important. Because I had thought about my own experience, I was able to set my bias aside and listen objectively to the experiences that the participants in the study discussed. Reflecting on my own bias and acknowledging my bias to myself allowed me to open my mind and consider the different backgrounds and experiences that the participants brought to the surface. From this experience, I deepened in my understanding of the local problem by seeing the problem through the eyes of other leaders. I also conducted member checking and peer debriefings according to the recommendations of Creswell (2012). The member checking process allowed me to continuously challenge my thinking as I interpreted the data by restating my understanding through rephrasing what I thought the participant was saying. This process allowed me to clarify any misunderstandings that I had developed, as well as clarify the information that was provided by the participant. I also conducted peer debriefing. Through this process, I discussed my findings and received feedback from a knowledgeable colleague. Conducting member checking and peer review, coupled with my reflective practice, allowed me to minimize any personal bias.

Procedure for Addressing Discrepant Cases

While performing data analysis, I found that some of the participants in the study had experiences that fell outside of the patterns that were emerging as I was coding the

data from the interviews and developing themes. According to the recommendations of Merriam (2009), I carefully examined these data for evidence of discrepancy. Several of the interview questions that I asked yielded data from two participants that were not consistent with data reported by the other participants in the study. These data did not fit the pattern that had emerged from the interview data with the other participants. The discrepancy in the data largely applied to research questions one and two. These discrepant data were reported and discussed in the narrative so that the readers were able to evaluate the experiences others have had with this phenomenon, weigh the evidence, and draw a conclusion for themselves (see Wolcott, 1990). Personal bias was acknowledged and mitigated through this approach, so that the reader saw an unbiased presentation of the data collected.

Data Analysis Results

A problem existed in a Florida regarding quality of mathematics instruction in elementary classrooms in the bounded case understudy. A possible contributor to that problem was the considerations that the school principals considered when hiring and assigning mathematics teachers who may have possessed insufficient content knowledge. The purpose of this study was to understand factors elementary school principals considered when hiring and assigning mathematics teachers as well as possible budgetary and other constraints that may have affected the depth of the applicant pool and related staffing decisions. To collect the data for this study, one-on-one interviews were conducted using a 17-item interview protocol instrument with primarily open-ended questions. The protocol is included in Appendix B. Each interview was intended to last

no more than 1 hour. Interviews were captured using audio recording with the permission of the participant. After each interview, data were transcribed, reviewed, and coded. The codes were consolidated into categories that were developed into overarching themes.

Participant Demographics

This study was limited to a region in the northern part of a state in the southeastern United States. Elementary school principals who were working within the bounded system under study served as the participants. The elementary school principals who were invited to participate in the study represented both the geographic and socioeconomic diversity represented within the region. This was accomplished through purposeful sampling (see Creswell, 2012).

Process for Generating, Gathering, and Recording Data

Purposeful sampling was used following the Creswell (2012) model. Typical sampling, a form of purposeful sampling, was selected, and the criteria for inclusion in the study was to include participants who were expected to be an average elementary school principal who was leading a school where teaming or departmentalization was taking place. This purposeful sampling strategy allowed for the intentional selection of individual participants who met the criteria for inclusion in the study. Individuals who were rich with information and who worked at a school where departmentalization or team-teaching took place were invited to participate in this study (see Creswell, 2012).

The total number of interviews to be conducted was not predetermined. Interviews were conducted until saturation was reached. Saturation was reached after 10 interviews were conducted, so there were 10 participants in the study. Of the 10

participants, eight were female, and two were male. The participants represented six different school districts within the bounded region. There were variations in the demographics of the communities where the participants worked. Four of the participants were from schools that were rural; three of the participants were from schools that were urban; and three of the participants were from schools that were suburban.

The participants were all elementary school principals, although the grade levels served by the schools varied slightly, with five of the schools serving grades kindergarten through five, four of the schools serving grades kindergarten through six, and one school serving only sixth grade. These data are summarized in Table 7 below.

Table 7

Grade Level Served by Participant

Participant	Grade level served						
	K	1	2	3	4	5	6
P1	X	X	X	X	X	X	X
P2	X	X	X	X	X	X	
P3	X	X	X	X	X	X	X
P4	X	X	X	X	X	X	X
P5	X	X	X	X	X	X	
P6	X	X	X	X	X	X	
P7	X	X	X	X	X	X	X
P8	X	X	X	X	X	X	
P9	X	X	X	X	X	X	X
P10							X

Framing Data Analysis Through the Research Questions

The interview questions were structured so that the conversations would yield data that would provide insights to gain understand about the three research question posed in the study:

RQ1: What human capital management practices and specific factors do elementary school principals perceive to be important regarding making teaching assignments in mathematics?

RQ2: What were the preparedness, background, and experiences of the elementary school principals regarding both human capital management and math instruction?

RQ3: How do constraints in budget, salary scales, and applicant pools influence the ability of elementary school principals to recruit highly qualified teachers of mathematics to place in mathematics classrooms?

The transcripts from each of the interviews were reviewed and coded. The resulting 41 codes were then organized into broad categories that were similar in nature. As I continued to code the data from the interview transcripts, I assigned categories to the groups of data, and labeled the data with summarizing phrases. Once I had these phrases for each of the groups of codes, I continued to refine the groupings. I reviewed each group of codes and consolidated them to form themes. From the generalized phrases, I developed a phrase that was reflective of the meaning from the codes that were grouped together. From those groupings of the coded data, 10 themes were developed to address the research questions. The 10 themes were as follows: (a) instructional structures vary

widely across the schools; (b) there were many strategies for placing faculty in teaching assignments; (c) social and emotional considerations often outweighed content decisions; (d) departmentalized schools and grade levels have a deeper emphasis on content knowledge, but administrator strategies to access content knowledge were widely varied; (e) conducting the interview; (f) understanding the characteristics of the applicants; (g) recognizing the effect of salary and other budgetary constraints on the talent pool; (h) Considerations around the participant teaching background, educational experiences, and other lines of work; (i) human capital management training implications for school administrators, and (j) policy recommendations. Table 8 below provides a summary the codes and that were organized and used to develop the themes.

Table 8

Overview of Codes Organized Into Emergent Themes

Codes	Themes
Code 1: Departmentalized in upper elementary Code 2: Effect of social-emotional learning considerations in primary	Theme 1: Instructional structure varies widely across the schools requiring considerations for assigning existing staff and planning for hiring additional teachers.
Code 3: Interest inventory to expresses preferences Code 4: Willingness to take additional training Code 5: Data-driven Code 6: Considerations when placing primary teachers Code 7: Considerations when placing intermediate teachers Code 8: Nurture verses content Code 9: Reading as primary responsibility in elementary school	Theme 2: There are many strategies for placing faculty in teaching assignments
Code 10: Time of year matters Code 11: Classroom management Code 12: Content Code 13: Teacher personality considerations Code 14: Team dynamic considerations	Theme 3: Social-emotional considerations outweigh content decisions as principals are hiring and assigning teachers.
Code 15: Data from prior teaching assignments and prior years Code 16: Observational data from walk-through or teaching a model lesson Code 17: Training and professional learning	Theme 4: Departmentalized schools and grade levels have a deeper emphasis on content knowledge, but administrator strategies to access content knowledge are widely varied.
Code 18: Interview questions Code 20: Interview teams Code 21: Screening from district level	Theme 5: There was little structure or consistency to the process of conducting the job

(table continues)

Codes	Themes
Code 22: Description of how applicant self-describes pedagogy and style Code 23: Curriculum familiarity	Theme 5: There was little structure or consistency to the process of conducting the job
Code 24: Rarely ask about a degree in mathematics Code 25: Focus on what workshops the teacher has taken Code 26: Availability of applicants Code 27: Depth of the pool Code 28: Educational background of those assigned to teach mathematics Code 29: Salary is not really a factor	Theme 6: Availability of applicants, depth of the pool, and the educational background of those assigned to teach mathematics.
Code 30: Budgetary constraints in non-title schools Code 31: Factors other than money were much more important	Theme 7: Understanding the effect of salary and other budgetary constraints on the talent pool.
Code 32: Alternative certification teachers Code 33: Traditional pathway teachers Code 34: Lack of expectation for content knowledge, state of math instruction	Theme 8: Teaching background, educational experiences, and other lines of work in which elementary school principals had experience
Code 35: Almost no formal training in human capital management Code 36: Effect of formal training in human capital management, if present Code 37: District support for human capital matters Code 38: Effect of strong training in human capital management on teaming structures	Theme 9: Effect of the deficit in human capital management training for school administrators.

(table continues)

Codes	Themes
Code 39: Teacher credentialing Code 40: Administrator content knowledge as an instructional leader Code 41: Principal professional development once in service	Theme 10: Recommendations and concerns with regard to hiring and assigning mathematics teachers.

To present the data from this study, the narrative that follows is organized and framed by the research questions. These data are presented through a summary of the participant demographics, quotes from the interviews with the participants, narratives to explore the themes that emerged as the data were coded, and tables to summarize the findings.

Research Question 1

The first research question asked the following: What human capital management practices and specific factors do elementary school principals perceive to be important with regard to making teaching assignments in mathematics? Through the interview process, I was able to elicit information about the practices that elementary principals considered important when making decisions about the way that the school master schedule would be structured to align the available faculty and newly hired faculty into an assignment that would make the best use of the talent that the teacher possessed.

Theme 1: Instructional structure varies widely across the schools requiring considerations for assigning existing staff and planning for hiring additional teachers. Theme 1 served as the umbrella to understand the ways in which school principals framed the classroom teaching structures for each grade level. The variations

in instructional structures had implications for both the placement of the faculty currently on staff as well as considerations for hiring teachers who would be new to the school' Theme 1 brought together information about the way that principals structured the master schedule and teaching assignments, which influenced the instructional setting and delivery of classroom instruction. The two preferred instructional delivery models that commonly occurred in the case under study were: (a) the self-contained classroom, where each teacher taught every subject to one group of students, and (b) the teamed teaching model, where two teachers shared two classes of students, and each teacher taught assigned subjects twice each day, once to each group of students. Occasionally, a principal was using the teamed structure and desired to implement teaming in all classrooms on a grade level but could not do so if there were an odd number of teachers to be assigned to the grade level. In those cases, one self-contained classroom was included on the grade level. The school principal strived to maximize learning through the best use of the available human capital and set the school structures to align with the availability of qualified teachers. When considering the availability of teachers, the school principals considered both the current faculty, as well as the depth of the talent available in the applicant pool. There were contrasting approaches to placing teachers in classrooms, however.

Each participant described the instructional settings in their school and discussed the rationale behind the decision to structure in the way that was chosen. There were some commonalities reported by all participants, however, there were more differences in the instructional structures than there were similarities. Table 9 summarizes the

description of the instructional teaming structures that were described above and employed in the bounded case under study.

Table 9

Instructional Teaming Structure by School

Participant	Grades served	No teaming	Teaming: second and up	Teaming: third and up	Teaming: fourth and up
P1	K – 6		X		
P2	K – 5			X	
P3	K – 6			X	
P4	K – 6				X
P5	K – 5			X	
P6	K – 5			X	
P7	K – 5			X	
P8	K – 6	X			
P9	K – 5			X	
P10	6				X

A common pattern that was revealed through the data was that all of the participants assigned one teacher for each classroom to teach all the subjects in kindergarten and first grade. One of the participants reported that teaming was implemented in second grade and higher, while another participant stated teaming was implemented in fourth grade and higher.

A common pattern emerged in the remaining eight schools. In these schools teaming was implemented beginning in the third grade. There was one exception to this pattern. In the school led by Participant 1, departmentalization began in the second grade. Participant 1 described the instructional setting in the school as follows: “Well, I would begin with the fact that we are somewhat departmentalized, beginning with grade 2 and up.” When prompted further, Participant 1 went on to say:

Teachers tend to sort themselves into two categories. We tend to have social studies and ELA teachers, and we typically have [those who consider themselves to be] math and science teachers in grades kindergarten through the fifth grade. Sixth grade is completely departmentalized. I also do an inventory at the end of the year. This is an interest inventory so teachers can report what they want to teach, and what they feel they are the strongest in. I try to pair them with their strengths, but also account for what their preference is, wherever possible.

There was one school that planned on trying a completely different approach. Participant 8 reported that, for the upcoming year, there would no longer be teaming or departmentalization in the school at any grade level, and that all teachers would be teaching every subject. Participant 8 reported that the staff pushed back quite hard and requested that they would continue to use a departmentalized structure. Participant 8 defended the position by pointing out that the first aspect of staffing to consider the human element. This claim was backed up when the participant indicated that first getting to know the faculty so that strong teams could be built with individuals who would be able to work together to form strong teams. Participant 8 justified her decision as follows:

We are in the business of people, and as such, I must consider the teachers as people and the students as people and think about all of their needs. Before I made this decision, I made it a point to really get to know my teachers. I needed to know this because I wanted to develop strong grade level teams. On the team, I knew I needed a take charge person, so that helped me know who that would be,

or if they going to be the one that does all the detailed projects, or whatever the need is. I needed the teams to be balanced.

Participant 8 went on further to describe specific moves that were made to achieve strong and balanced teams' The participant noted that the first consideration to focus on was people and teaming, which contrasted with some of the other participants who placed test scores and content knowledge ahead of personalities and social and emotion factors' The considerations that Participant 8 considered to be most important were related to growth of a particular team or growth of a particular teacher' Participant 8 continued, stating:

I knew I needed growth in kindergarten, and we needed to move a teacher. So, if I had made it about test scores, it would not have been a good conversation, so I played on her personality strengths, and picked a person to move who could survive on that team. I think I see people and strengths and figure out well you could work better with this person. In a rural, title I school, that is better than worrying so much about being content specific. My biggest struggle was to change the culture of the school and to be completely frank, with the pressures that I had from the district for school grades and test results, I had to focus everyone on teaching the children how to read.

Of those participants who invoked the model of team teaching or departmentalization, to maximize the available human capital, there was a pattern that emerged when deciding the subjects that each individual teacher would be assigned to teach. In almost all cases, participants split the teaching responsibility, with one teacher providing instruction in language arts and reading with the other teacher providing

instruction in mathematics and science. In contrast, there were no patterns that emerged as to how social studies teaching assignments were made. Participant 6 described the nature of the content of social studies as a basis of her decision, stating:

There is a lot of reading in the social studies block. So, I group that content with the reading. It helps with the reading because social studies is nonfiction reading, you know, informational text. In the reading block, the kids don't always have a lot of informational text to read, so this is a good way to pair the social studies to really develop strength in reading. It is a strategy to get more diverse reading experiences, and to cover social studies at the same time.

Participant 7 explained a different approach, describing a decision based on the master schedule, sharing:

In my school, it [social studies] depends on the schedule. If there is a free half hour leading up to lunch or resource, then we put it there. Whoever has the students at that time will teach social studies. So that means the homeroom teacher gets [to teach] it if, let's say, they have resource at 9:10. So it goes, homeroom, 8:30 – 8:40, then social studies, 8:40 – 9:10, then off to resource. That way, we don't have to break up the reading block or the math block. It isn't a lot of time, but it works for us.

A pattern emerged where two participants reported making the placement decision based on the strength of the teacher. In the case of Participant 10, who led a school that was a sixth-grade center where sixth grade is fully departmentalized, the decision was based on who is left after the assessed subjects are staffed. Participant 10

described the process of assigning teacher by considering first which courses have a high-stakes assessment at the end of the year, then by courses that have an high-stakes assessment, but not at the current grade level. Once the high-stakes courses had a teacher assigned, then the remaining faculty who had not already been assigned were given an assignment. Participant 10 described the process, stating:

Let's face it, it is the least stressful class to teach. It is not tested. So, I find my strongest math teacher first, then I move to reading. Science isn't tested until eighth [grade], but it is tested. Well, social studies does have the Civics EOC, but civics standards and sixth grade standards don't really overlap. So, whoever doesn't get picked up for the assessed subjects [pause] well, that is who I place there.

With a similar response, Participant 1 led a school where departmentalization began with the second grade, which is the earliest of any participants reported utilizing the practice of departmentalizing. Content competency was important, as well as the teaching preference of the candidate. Participant 1 reported trying to honor the request of the teachers with regard to teaching assignments, however, the participant stated, "Content knowledge is very important."

The contrasting models were that in some schools, the teachers taught social studies to their own homeroom classes, and in other schools the teacher for language arts also taught social studies. Further difference emerged with regard to assigning teachers to social studies classes. Elementary school principals often made social studies assignments by considering a social studies teacher with the same regard as a reading

teacher, and assigned the reading teacher to also teach social studies. In other cases, the elementary school administrator made the assignment to teach social studies based upon where there was a free amount of time available in the master schedule.

Theme 2: There are many strategies for placing faculty in teaching assignments. Under Theme 2, the human capital management strategies for the ways in which the principal made teaching assignments were grouped along with the rationale for the decisions. One common pattern that emerged was the desire of the principal to honor the wishes of the teacher regarding what each individual teacher would like to be assigned to teach; however, in many cases, the principal reviewed other key factors prior to making the placement. There were quite a few contrasting factors that principals considered as they applied strategies to make teaching assignments. In many cases, the decision was reflective of the personal preferences of the school principal. A pattern did emerge, however. Decision-making came down to three overarching strategic considerations, yet there was no consistency in which factor was given the highest priority. The three considerations were (a) the desired assignment of the teacher, (b) data-driven decision making, especially in reading and math, and (c) the social and emotional needs of the student.

To determine the interest of teachers, most of the school principals used a similar strategy. Each January, every participant began building the master schedule for the upcoming school year. At this point in the year, which is the academic midpoint, all the participants reported that they contacted each teacher to touch base and inquire about teaching preferences for the upcoming year. A pattern emerged for the way that

information on teaching preferences was obtained from the teachers. In most cases, a survey was sent to each teacher. Once all the surveys were reviewed, principals used the survey data as placement decisions were made.

There were exceptions to this process, however, especially when the principal did not agree that the preference of the teacher was the assignment where the teacher would have the most alignment to the strength possessed by the teacher. When the principal was not able to honor the request of the teacher, the principal always discussed the decision with the teacher so that the teacher would understand why the request was not honored. All principals wanted to talk with the teacher and build a common understanding for the reasoning behind the decision. For instance, Participant 3 recalled a situation in which a teacher wanted one assignment, but the school data suggested another might be a better fit. Participant 3 recalled:

I try to pay attention to what teachers would like to do but at the same time if what a teacher requests to teach does not match up with the data that shows me what they're good at teaching then I will make the decision for them to teach something other than what they have requested. So, an example of that would be I had a fourth grade teacher at one point who had taught all subjects because that year we had an odd number of teachers, so she had to be self-contained, and so she told me she would like to continue doing math science in the future.

Unfortunately, her scores were better in language arts. When I say better, I mean like double that you know. So, I'm talking like in the high 60s for proficiency in language arts, but only in the 40s for proficiency for math and science. So even

though she tells me she likes math and science that is not what she was best at teaching, at least when I look at the data. So, for one year, the next year, she did have to teach language arts because that's what the data showed me she was good at teaching.

I probed to find out more about how the teacher responded to the change in teaching assignment. Participant 3 stated:

She was not thrilled. She said that I was implying that she is not a good teacher. And I said, "Well I beg to differ. I have been in your classroom and I've seen some amazing lessons in language arts and social studies, and I know that you may not love it but. But what I see is that you're good in the data backs up what I see."

Participant 3 stopped speaking and there was a long pause. She reflected, then continued to say:

I would never make that decision solely based on what I see or solely based on the data. But when those two things coincide, and I see you teaching great language arts lessons and your data looks good. Then that's the way it goes.

From the human capital management lens; however, this principal knew that it would be better in the long term if it was possible to implement a strategy to work with the teacher to develop the skill that were needed for success in the desired content area. Participant 3 continued to explain what occurred over the next year. Participant 3 stated, "Now, since then she made some improvements and now is back to math and science". By working with the teacher and providing coaching, the participant was able to

strengthen the teacher so that she gained the qualifications needed to teach the desired area.

Participant 2 presented a similar approach, first considering the desire of the teacher, and then considering content knowledge. Participant 2 stated,

I look for people that have strong content knowledge to be my math and science teachers but I also do an inventory at the end of the year, to understand what teachers want to teach that they feel the strongest in teaching because I try to pair them with their strength.

Participant 9 also administered a survey at the midpoint of the school year.

Participant 9 gave the request of the teacher considerable weight, however, the decision point for this participant was heavily dependent on the social and emotional needs of the students, stating:

I try to consider the placement that the teacher wants, but content knowledge is very important, and if I don't see it [content knowledge], then I will not honor the requested subject. The children must be at the center of my decisions. So, I look at the content that the teacher will bring [to the classroom]. I look at the data from the tests. But I also consider the way that teacher will interact with the children. Is she too tough for kindergarten? Maybe she is not strong enough to support the needs of the older children. I consider all of these things, but thing about the student needs first. Social-emotional as well as content.

Other participants presented stories that supported data-driven decisions; however, a pattern emerged regarding placing or hiring a primary teacher versus an

intermediate teacher. In the bounded case under study, high stakes state assessment begins in third grade. The hiring and placement of teachers had patterns that were recognized when looking at the considerations for the different grade bands. Participants discussed their thoughts on hiring and placing teachers in general, and then specifically, when looking to place a teacher in a primary classroom, such as first grade, or an intermediate classroom, such as fifth grade. When asked about hiring and placing a teacher, in general, Participant 1 believed that all teachers should set a benchmark for high rigor in the classroom, regardless of the grade level. Further, Participant 1 also considered that the relationship teachers developed was also very important, and that the relation must be built with the children before learning will occur. Participant 1 stated:

Well, in my interview process I look for teachers that believe in rigor, and they believe that every child can learn. I also want teachers who believe that you have to establish a relationship with that child before you can teach that child.

When asked about hiring a first-grade teacher, Participant 1 emphasized the need for content, even in the primary grades, but inferred that content knowledge was less important than social and emotional learning in the primary grades. Participant 1 went on to say:

I do tend to look for people that are a little more nurturing for lower grades than I do for upper grades, but content knowledge is still important. I still do require that there is some background in teaching math and science. Even in a first-grade classroom I still need teachers to expect a high level of rigor because kids will rise to the expectation that you have for them.

Similarly, Participant 9 believed that intermediate teachers needed strong content knowledge in mathematics, however, in the primary grades, the participant believed that teachers did not need to have strong content knowledge in math. Participant 9 placed greater emphasis on literacy in the primary grades. Participant 9 presented further evidence, stating:

It would be different because in first grade I would not care as much if they had experience content knowledge in math. I need to be sure that they understand how kids learn to read and write. That is our principle responsibility in the primary grades: teaching them to read and write.

There was a similar pattern to the beliefs held by Participant 1 and Participant 9 by Participant 6. Participant 6 believed that the primary role of the elementary school is to teach children to read and that literacy was the most important area to consider in the primary grades. In addition, Participant 6 described the importance of content knowledge, especially in mathematics, as the grades progressed. Participant 6 stated that:

The most important thing to me in first grade is literacy because, at that level, I know how critical it [reading] is in the first grade. I would want to make sure that a teacher could explain to me their processes for teaching children to read.

Regarding hiring or placing a teacher for fifth grade, Participant 1 stated, So, at the fifth grade, level, teacher content knowledge is very important. I can get teachers to training, but if they [the teachers] do not believe that all kids can learn at a high level then there's no point. I can't fix that underlying belief.

There was an outlying strategy that surfaced through the interviews, however. One principal reported she made the time to make one-on-one appointments with each teacher to discuss what teaching assignment the teacher would prefer, as well as to discuss the career trajectory and the career goals for the teacher. This participant believed that creating the relationship with each teacher individual teacher would be worth the investment of time because the participant believed that when difficult decisions needed to be made, such as teaching assignments, there would be a great sense of respect in the case where the participant could not assign the teacher to the desired grade level.

Although the data collected under Theme 2 shows some similarity regarding the desire of the principal to accommodate the desired placement of the teachers, there was variation in the way that the school principal made the determination. Overall, in the schools with more challenging student populations, elementary school principals tended to rely more on teaching assignments made with regard to the ability of the teacher to work with more challenging personal student situations. In addition, a similar pattern emerged with regard to the consideration given to content knowledge as the grade level increased.

Theme 3: Social-emotional considerations often outweigh content decisions as principals are hiring and assigning teachers. Theme 3 captured the influence that social and emotional considerations had on placement decisions. A pattern emerged in this area because every participant placed emphasis on the critical importance of meeting the social and emotional needs of the student. This played out in different ways depending on the setting, but the common thread that the participants considered was

meeting an unmet need of the child to compensate for something that might have been missing at home. This identification of an unmet need at home held true across every demographic.

In most cases, participants stated that the personality of the teacher mattered more than content. Participants leading schools in the urban core discussed that there were children in their school being raised in poverty by a single mother or a grandparent due to incarceration or addiction of the other parent. In these cases, a teacher needed to have strong interpersonal skills and be able to compensate for some of these gaps at home, and show the children that they were, first, cared about as individuals. Participant 7 stated:

And so, you have to be able to do a lot of nurturing and have an attitude of openness and be willing to take whatever the students bring to the table. This is because some of our kids brings almost no skills, but they come in with the big, pretty bows in their hair, but underneath it all, all the flash, they come in and they're hungry and they may not have even had a real place that they stay. You know, they may be homeless or something.

Participants in the rural areas reported similar conditions and that students may not be getting what is needed at home to meet both their physical need for food and their emotional needs for stability. All participants indicated that the teachers that are placed in their schools must be able to fill those needs and create a warm and caring community before real learning can take place.

Participant 2 led a rural school in the region. That individual reported that even the time of year mattered when hiring a new teacher. When I asked the fourth question,

“What are the three or more factors you perceive to be important when making teaching assignments?” the participant responded with a question back to me’ The participant asked, “What time of year is it?” I paused and reframed the question to ask the participant, “What factors do you consider at different times of year?” The participant went on to describe the sense of abandonment that many students in the school experience, sharing that the decision of who would be hired and assigned to teach any content area was based upon strength of personality, and content knowledge was not considered. Participant 2 described the criteria for placing a teacher in the middle of the year, as follows:

We are a Title 1 district. A lot of our children come from poverty and so they are used to being left alone. Parents are in jail or in rehabilitation. And, so, if I am hiring a new teacher, let’s say, in the middle of the year, that means that now someone has left them here at school, too. That would be the situation at this point in the year if I am hiring someone. I need to hire someone with strong classroom management, or the kids would try their best to run them off rather than allow themselves to get close to them, because if they do that, it sets them up for further disappointment. They would be afraid this new teacher will leave them, too. Just like their mom, just like their dad, just like their previous teacher did. The behavior would become escalated in response to the circumstances, and so at this time of the year, the deciding factor would be classroom management. At the beginning of the year, though, the decision would be based on content and what their scores were in previous years.

Similarly, leaders of schools in the urban core often experienced a similar need to hire and assign strong teachers who were able to handle challenging student behaviors due to the disruptive homelife' Participant 7 described the situation that many of her teachers address on a daily basis stating, "I need somebody that can love every single one of them because when you're six it's so important for somebody to love you. You know, kids don't feel safe and loved. They're not going to be ready to learn."

These challenges were also present in schools that were in some of the more affluent areas of the region. There were three military bases in the area, and students who were dependents in military connected families often experienced similar conditions at home, due to deployments. While the reason for the feeling of abandonment was different in this setting, the outcome and behaviors of the students were similar, and the challenges of hiring and assign teachers in an area of high military populations were similarly challenging. Participant 1 stated:

I need teachers who understand the challenges of working with a high population of military connected students. This is important, especially when a parent deploys, or comes home from a deployment. It's a disruption in the home, and the kids carry that into school. So, they're disruptive in class, they make a fuss, and now nobody can learn. First, that teacher I put in that room needs to understand the dynamic and needs to know how to work with children that are experiencing emotional distress.

Although there was great variation in the demographics of schools that the participants led, the ability to nurture students who came to school with varying situations

and needs were considered to be one of the most important factors in placing teachers. The problems and situations ranged from hunger and homelessness, to students coming into school feeling a sense of abandonment, and the cause did not matter. Whether due to substance abuse or incarceration, the children were not coming in ready to learn, and the teachers needed to have compassion and the ability to nurture children. Above all else, all participants indicated that the need to provide a safe and caring classroom environment largely outweighed content considerations, especially in the primary grades.

In addition to the characteristics of the personality of the teacher to interact with the children, many principals considered personality as it related to the dynamic of the grade level team. In some cases, decisions were based on the interpersonal skills. In those cases, content was not reported to be an important factor. Participant 4 believed that strong grade level teams were important to the functioning of the school. In a situation in which a team was not functioning well, the participant would be willing to disrupt another team by moving a teacher. This would be done with the intention of developing a better team dynamic. In this case, content was not considered over the need of developing functioning teams' Participant 4 stated:

Now suppose I have an opening in fifth grade, and I have a first-grade teacher who has the right personality to work with the other fifth grade teachers, well I am going to put her on the fifth grade team. I need the teachers to be able to work together well. They can help her with the content if she is coming from first grade, but I really need strong teams. The content will come, even if it's math. We

can coach them up, send them to a training, you know, help them learn the math, and how to teach the math.

Participants shared stories of their considerations when hiring and assigning teachers that relied more on the ability of the potential teacher to address the social and emotional needs of the students whom they would be teaching. The considerations varied slightly from the rural to the urban core, with special considerations to those serving high concentrations of military-connected students. Many of the students in the bounded case came to school with stressors from home, and while the conditions causing the stress varied across the region, the result was the same. Some of the situations causing the stress included:

- poverty
- food insecurity
- incarcerated parents
- parents who were addicted to drugs
- parental substance abuse in the home
- long separations in the family due to military service

All students from these situations came to school in need of foundational and basic supports. Social and emotional learning experiences were very important in the schools with the most predominant exposure to these conditions' When principals working with students in these settings were making hiring decisions, the principals had a tendency to hire first on social and emotional learning considerations, with content as a secondary consideration.

Theme 4: Departmentalized schools and grade levels have a deeper emphasis on content knowledge, but administrator strategies to access content knowledge are widely varied. A common pattern that emerged across the schools was that the latest departmentalization began was in the fourth grade, with all but two of the school departmentalizing beginning in third grade. The emergence of this pattern indicated that most schools begin to departmentalize in the third grade. One of the factors leading to the decision to departmentalize was that high stakes state testing began with students in the third grade. Participant 5 stated:

It [third grade] is an assessment year, so you have to be mindful of content. You've got [name of assessment] reading, and you've got math, then in fifth grade, you've also got science to think about on top of that. That's our benchmark. That's how we are measured. So, we have to put strong content people in third grade and up. I like real world applications, too, especially in fifth grade because the science is now in the mix. With science, I really want them to know the standards. What else does it align with? Because I don't want cookie cutter teachers that teach standard by standard or just out of the book. I want to see the real integration. I want the kids to love math and see it come to life in science. So, I need people strong in that content.

Participant 3 reported similar thinking also reported departmentalizing beginning in the third grade, however there was a difference in the reasoning. In this case, the reason for departmentalization was based on teacher strength as a reading teacher. Participant 3 stated:

Third grade is a mandatory retention grade. So, if the kids come to us and they have lots of gaps in reading, there is more pressure to fill those holes so that they can get to mastery on the grade level standards. And now if the child gets to third grade and they can't read, you know, research shows it's very unlikely that they're going to graduate from high school. And so, the pressure is on these teachers for that as well. That makes it unfair to expect one teacher to cover math and science on top of reading.

As Theme 3 was developed, it was evident that elementary school principals did consideration in the impact of the social and emotional learning needs of the students when hiring and making teaching assignments. However, it is important to note that the level of consideration given to the social and emotional aspects of the placement decisions had a stronger affect as elementary school principals considered teacher assignment in primary classrooms. This was largely due to assessment considerations' In third grade and higher, state assessments are administered, and elementary school principals tend to consider content to be more critical in the upper elementary grades. The factors considered by principals shifted from social and emotion needs to content competency as the grade level rose. In most cases, high stakes assessment drove the staffing decisions due to the effect of student achievement on school grades, a measure of accountability for elementary school principals.

Research Question 2

The second research question asked the following: What were the preparedness, background and experiences of the elementary school principals with regard to both

human capital management and with math instruction? Through this research question, I asked the participants about their experiences with determining who to assign to provide instruction in mathematics in the intermediate grades, what strategies were used to assess the content knowledge that teachers possessed, and how the participant got to know the underlying skills of the applicants. I also asked about the educational journey of each principal, both as a student and an educator. As the data were analyzed, several patterns emerged. These patterns were grouped into themes.

Theme 8: Considerations around the participant teaching background, educational experiences, and other lines of work in relationship to considerations while hiring and assigning teachers. There was a common pattern to the educational attainment of the participants. All of the participants in the study held a master's degree in educational leadership; however, there were variations in the undergraduate experience of the participants. Two of the participants held content degrees in a STEM field. One participant held a degree in an applied science, and another held a degree in economics, which provided a strong background in mathematics. The remaining participants had an undergraduate degree in education, and of those participants held an undergraduate degree in special education, as well. Two of the participants were currently working on a doctoral degree in educational leadership at a local university.

There were great differences in the teaching background that the participants had before becoming a school administrator. A common theme that emerged was the notion of whether or not the participants considered themselves to be math people. Some of the participants considered themselves to be strong in mathematics, although others did not

consider mathematics to be their area of personal strength. The self-perception and self-efficacy for mathematics influenced the level of comfort that principals had in hiring and placing math teachers. Participant 8 explained:

I am going to just say it, I did not teach math, except for a few years, and I am not strong in math. When I walk into a classroom to observe a lesson, and the classroom is orderly and the students are paying attention, working, I am going to rate that teacher well. I don't know all the content well enough to know if there are misconceptions. If they are teaching it wrong, I may not pick that up, especially in the upper grades, especially in sixth grade. This is the same in the interview, too. If they can talk through a good lesson with all the right structures, I am going to assume they know that math. I really have no way to know that, other than their students test scores. If the test scores are ok, then I can feel safe that they know the content.

Participant 3 also did not consider math to be her area of strength, and often deferred to the assistant principal on matters regarding mathematics, taking a different approach. This participant also never had taught mathematics. Participant 3 stated:

It's interesting because you do see people that, conceptually, you know they are math people. I'm not a math person and so, I know, I know, my AP, though, she's a math person and so she'll whip out those numbers and she'll also know if the teacher can handle the math. I have to think about all those curricular pieces when I am deciding where to place teachers. It's much harder for a self-contained teacher to be responsible for all those pieces, and I relate to that. It's hard to teach

something that you don't really feel comfortable with, something you don't really feel that you know.

Participants who had taught mathematics in their teaching career prior to becoming an elementary school administrator considered themselves to be stronger in mathematics supervision than those participants who had not. The level of self-efficacy for individuals who had direct experience with mathematics was also higher. Those participants who had been mathematics teachers, or who had a background in applied mathematics believed that they were better prepared to supervise instruction in mathematics and asked more content directed questions in the approach that they took with regard to making an assessment of pedagogical content knowledge' Those participants with greater content knowledge in mathematics asked deeper questions when interviewing teachers.

Theme 5: There was little structure or consistency to the process of conducting the job interview. Job interview techniques varied widely across the region. Most of the participants used a uniform set of questions for each applicant, but none of the participants reported that they used a structured set of questions that were common across the school district or even common across multiple schools. Some participants reported that they change the questions that they asked during the interview, as needed, to probe and get more information.

When participants discussed the techniques used when interviewing candidates for a position teaching in a primary classroom or in a self-contained classroom, compared to a interviewing candidates for a mathematics position on a departmentalized grade

level, there were patterns that emerged. Participants with background or experience in mathematics had a different approach to asking questions with regard to math content knowledge than those participants who did not have background or experience with mathematics. Participants with background teaching mathematics reported looking for evidence of a strong background in content. Participant 1 stated:

Well, in my interview process I look for teachers that believe in rigor they believe that every child can learn and that believes that you have to establish a relationship with that child before you can teach that child. So, content knowledge is very important. But I can train teachers I can get teachers to training but if they do not believe that kids can learn at a high level then there's no point.

Participant 10 discussed the importance of content areas expertise when considering hiring a teacher for a teaching assignment in mathematics. A pattern emerged with regard to participation in high quality professional learning experiences that candidates for a teaching position may have participated in. Evidence of this was presented by Participant 10 reported that when interviewing candidates for a position teaching mathematics, there was an indicator which signaled that the candidate had strong content knowledge in mathematics. A professional learning experience that was available to teachers in the region, Intel Math Professional development, was considered to be an indicator that a teacher who had participated in the training had stronger content knowledge in mathematics than a teacher who had not participated. Participant 10 stated, "Sixth grade is completely departmentalized, because this is a sixth-grade center, and

therefore math teachers need to be Intel trained. Hopefully before I place them, and if not, they [the teachers] need to be willing to take the training.”

A pattern emerged regarding what the top priority was when making decisions about hiring and assigning teachers. Some participants believed that elementary school teachers were responsible for setting a strong foundation in all of the content areas addressed through the elementary school curriculum, while in contrast, most of the others believed that, ultimately, the elementary school is primarily responsible for teaching children to read, and placed emphasis on reading, especially in the primary grades.

Reflecting on this belief, Participant 3 stated:

In first grade I would not care as much if they had experience with lower grade students. My questioning would be more based on do they understand how kids learn to read and write. That would be the most important thing to me in first grade because, at that level, I do understand that and I know how to teach students how to read and write as our top priority. So, I would want to make sure I know how the teacher is strong in reading. This is such a critical year, first grade. I would want to make sure that a teacher could explain to me their processes for differentiating instruction, and for Tier One strategies. This is for all their kids, and I want to know what they're going to do to make sure all kids are getting the exposure they need for reading and writing. Then I would ask them questions that were very specific to differentiation in Tier 2 and 3 for those type of kids who need more intervention.

I probed this participant to see if experience, background, or content knowledge were considered when placing hiring or assigning a teacher in a primary grade. I found that the participant believed that literacy was a fundamental skill for other content areas, including mathematics. The participant believed that students who were not able to read and write would not be success in mathematics. Participant 3 went on to say:

I certainly ask some questions that have to do with math, but I do not consider it first. To me, reading and writing in kindergarten, first and second grades especially, are the foundation, and they're not going to be able to do the math effectively if they can't read and write. And so, reading and writing would be my first consideration. Now in a perfect world I'd have someone who also felt really strong with math.

Participant 9 had a different approach to hiring and assigning teachers. This participant valued teachers who had a diverse background with regard to the grade levels that the teacher has experienced. Teachers who have taught in multiple grade levels have a stronger understanding of the development of concepts over time, as well as the way in which conceptual knowledge is built. Participant 9 stated:

The perfect candidate will have taught in more than one grade level so that they have an understanding of the progression of the standards. I would prefer someone who understands how important number sense is with children and someone who believes in using models and manipulative. I would have that person explain to me exactly how they use manipulatives in mathematics in their lesson planning.

Another contrasting approach was from Participant 6. Participant 6 expressed having some support from other principals within the district. Although this support was not described as a formal mentorship, the description of the experience provided by the participant did offer insight into some of the informal relationships and collaboration that build in this school district due to the inadequacy of the preparation program. Participant 6 described some of the things that others had shared:

I have had other principals help me with [building interview questions] but it's not consistent. Some principals just tried to unpack their thinking to help me develop that skill. One Title I school principal said to me that the time of year that she's hiring teachers also affects her decision. Well, I certainly get more applicants in the spring than any position after Christmas. It seems like I get more applicants, and so maybe that's because people are graduating in December, and they're available. I even get applicants who aren't quite done with school yet. It's February or March but they'll still apply for the position because they think maybe they can still be qualified for it [the position]. You know, after June it dwindles. And here's a for instance. I had a sixth-grade language arts opening a few weeks ago [and] I had three applicants. One had horrible references; one lived all the way in like downtown [in the big city], which is a good hour and 15 minutes away, maybe hour and a half with traffic, and that just would not be a positive thing. And so, I was lucky to get someone from a neighboring city, which is only 15 minutes away. So, I hired her. I mean, really, she was my only choice when I came down to it. Wow.

The participant paused and sighed. I questioned deeper to see if the individual who was hired had met the criteria, or if the participant had to settle for this person.

Participant 6 went on to say,

I did not have the opportunity to actually interview her myself because I was on a trip for work. So, my assistant principal interviewed her. But when it came down to it she was our only choice and she cleared screening. She had good references and experience, and you know at that point, I mean if it's July or August, unfortunately, it's like if you're certified and you're alive, you're breathing, you got decent references, and your certified you're hired.

In contrast, Participant 5 had experienced formal training in human capital management as part of the principal preparation process through the university program.

Participant 5 reflected:

We've got to know we are in the business of people. And if you don't understand how to read people, or how to onboard them, even that's important. And [so is] understanding what you're looking for when you're when you're interviewing. What are your parameters? What can you say and [what you] can't say? I mean think about that. Even in itself. So, [that is why] the university part of that law class was actually helpful, in retrospect. I think back [and] I can remember we had four candidates we had to choose. What were the good qualities on paper? Now, let's watch their interview. What did you pick up? Would you recommend hiring or would you not? What does the contract say? What do you know? That's what we actually did as a project and a class assignment.

Participant 5 did not see the relevance of this training at the time, and reflected, “I can remember sitting in class going, why do I need this?” Participant 5 went on to reflect on how critical this formal training was, recalling:

And then when I got into the [principal] role, I was like, oh thank goodness I had this [training] because, even as many times as I've interviewed candidates, I go back to this [training]. What kind of probing questions [should I ask] because you can Google it all day long, but if you're not looking at the process behind hiring, you don't know it. I think of the Gallup training our district and a lot of training in Florida where all the administrators had to go through Gallup training. [We learned about] not only our strengths, but what the candidate strengths are. And then they [the teacher candidate] had to take some kind of test, and then we pull their test results down and we'd talk about them before they ever got there. We're watching for this because this is a kind of what we need to fill this team.

Across the region, there was little theoretical underpinning or structure to the process of conducting interviews. Across the data collection process, there were minimal examples of participants who had received any formal training in human capital management or in conducting interviews as a part of preservice principal preparation programs. In addition, there were few examples given of district support being provided to principals. While some participants received training, those experiences were conducted in programs in other states. For this reason, the data suggest that there is a gap in leadership practice in the bounded case with regard to education and training in human capital management practices and the interview process.

Theme 6: Understanding the characteristics of the applicant. Because different people and different personalities existed in the teacher candidate pool, it was important to know what characteristics the various applicants had. There were great variations in both the quality and availability of the different geographic area areas across the bounded case' Participants described various characteristics that they have experience as candidate searches are conducted' Patterns emerged with regard to personality types and also with regard to credentials. Personalities were described as nurturing, as well as tough or strong. Additionally, some participants considered other work and life experience that were not related to the degree or certificate possessed by the candidate. Levels of content knowledge were also described by participants. Certification types that the candidates held were another characteristic that elementary school principals considered. Certificate levels reported by the participants included PreK-Primary, Elementary Education K-6, Alternative Certification, and those without a teaching certificate' Participants discussed a combination of personality characteristics as well as certificate types most participants discussed these factors in coordination and in a balanced manner'

Some participants reported that those with more nurturing personalities were most likely considered for the primary grades. Participant 1 described a blended approach with regard to the characteristics that were sought in a candidate to hire. Participant 1 stated:

I do tend to look for people that are a little more nurturing for lower grades than I do for upper grades, [although] content knowledge is still important [in the lower grades]. I still do require that there is a math and science concentration or an

English, language arts, and social studies concentration. Even in a first-grade classroom I still need teachers to expect a high level of rigor because kids will rise to the expectation that you have for them.

In contrast, some participants preferred to focus on credentials, dismissing candidates who held only a pre-K or primary certificate. Participant 3 reviewed the credentials that a candidate held and used the credentials to make decisions. Participant 3 stated:

Well, I try to only hire people with a kindergarten certification, not a pre-K primary. [I do this] because I think even kindergarten teachers need to have some experience with upper grades and see what that looks like and what kids are expected to do. But beyond that I do ask specifically if teachers have been trained in Eureka. If teachers have been trained in Intel, you know those are kind of bellwether kind of marks that let me know whether they're qualified.

Diverse teaching backgrounds and real-life experiences that can be shared with the students were also important to some of the participants. For example, Participant 1 shared:

I interviewed someone two years ago, and she is on my staff now. She has been a teacher for about a decade in the Arctic Circle. She was a math and science teacher who taught [the children of the] scientists who worked at the Arctic Circle. She had not just a master's degree, but she had written curriculum. She had attended PARCC assessment groups. She was extremely knowledgeable of Common Core, and she could talk to me about national math standards and what

was good and what needed work. She was extremely knowledgeable and had an interesting diverse background, and I tried to make her shake on it and make the deal that very minute. She was an ideal candidate because she had a strong background. She had a different perspective. She had a strong knowledge of the national math standards.

Another participant looked strictly through the social and emotional lens, looking to focus on social and emotional learning. Participant 7 stressed the belief that the whole child had to be considered first, and that in the elementary school setting, building confident students who were ready for the challenges of life was very important. This participant believed that teacher attitude towards the students was the most important consideration. Participant 7 stated, “The ideal candidate, to me, has a strong desire to help kids.”

In contrast to all the other participants, Participant 5 reported having received formal training in both human capital management and hiring practices obtained while studying out of the state under study. The formal training that this participant received had an effect on the way that human capital management practices were managed. The participant considered a much broader scope of implications for the decisions that were made. The formal training that this participant received had a clear effect on how these job responsibilities were handled. With formal training and experience in human resource management, Participant 5 brought a different and broader perspective, and stated:

We did a training on finding personality traits. We did [Strength Finder] training back years ago in [another Southern state]. That was the most beneficial training

I'd ever had. I did that training at the district that I was with. And that book was also one of the books that was out, and at the time I was in my doctoral classes. The book on EQ had come out, and for the first time, people were taking a new approach, by looking at leading with your strengths. This challenged my thinking about everything I did from that point and going forward. Especially around the implications for school culture. How does this affect your culture of your school? How do you build a good culture and what type of type of people do you need to fill your holes and gaps what will you be looking for? Knowing how to look for that. I just can't imagine not having that [Strength Finders] training. First and foremost, I would say the best training as far as people what's the Strength Finders Gallop training because it's held true every single time ever. And even when my husband brought the book home. I'm like, what are you doing that's old! I guess we just did this at work. I said, bring me your people and I could literally look at the page and move people around not knowing who they were but based on their strengths I could build teams. And he took it back to work and goes, how did you do that? They're awesome. I'm there they're meeting above quota and they've never had this. Why? I said, because you had the wrong people together. It's so important when building teams, schools have a mentality of teams and cultures. You've got to know work with people's strengths and not their weaknesses. And that it is kind of a positive experience.

As Participant 5 continued to discuss the practice of human capital management, it was apparent that this deep and ongoing training experience had a profound influence

on the way human capital management was practiced in the day-to-day operations of the school. Participant 5 continued by making recommendations for other elementary school administrators, stating:

If you could train people or have a class in just personalities and building that positive culture, then that's part of it. That's part of the hiring process; it's part of managing that human capital. You've got to know people. Long gone are the days of hiring the athletic director to be the instructional leader. No offense to coaches because there are some good ones [in school administration]. But coaches that run it like a football team need to realize that people can't be managed like football players. They can't just go to the whiteboard put and people in place without considering their individuality anymore. But yet, you've still got to think like a football coach, because you're going to put your best running back with your best receiver, and your best quarterback with the best defense. Or are you going to put the quarterback in that can throw with your wide receivers? That's kind of a coach thing, too. But again, it comes down to their personalities. It comes down to what makes a cohesive team, and what strengths are missing from a team that you may be needing to hire for. You're looking for candidates who possess the strengths that are missing from the team. That's important to me. We've got to have that [trait or strength] because that's what could be missing to make a given team really come together and be successful for the students.

In summary, participants described their overall hiring and selection process, noting the observed characteristics and experiences of individual teachers applying for

positions as well as the credentialed characteristics of the teachers in the applicant pool. There were variations in hiring practices based on the preferences of the individual elementary school principals. Some principals were more concerned with the ability of the teaching candidate to meet the social and emotional needs of students, while, in contrast, other elementary principals put content knowledge and credentialing and level of certificate ahead of the personality characteristics.

Research Question 3

The third research question asked the following: How do constraints in budget, salary scales, and applicant pools influence the ability of the elementary principal to recruit highly qualified teachers of mathematics to place in mathematics classrooms?

Theme 6: Availability of applicants, depth of the pool, and the educational background of those assigned to teach mathematics. A theme emerged with regard to the availability of highly qualified teacher candidates across the region. Regardless of the geographic area, the perception of the participants was that the applicant pool was shallow and that the participants did not have enough individuals to select from when hiring teachers. All participants also noticed that there were fewer applicants for any given teaching position than there were in the past. In contrast, participants in the urban and suburban areas of the region reported receiving a greater number of applicants than those in the rural areas. Based upon the number of applicants who applied for a given position, the rural area of the region typically had even less applicants for every job. Although geography affected the availability of teachers overall, those applicants who considered themselves to be a mathematics teacher were even more sparse. The changes

in the availability of teacher candidates had been noticed by the elementary school principals' For example, Participant 1 stated:

What I have noticed is that there are fewer and fewer teacher applicants for any particular opening this school year. I did end up hiring several teachers that I would not have hired otherwise because I had to have someone in there. There were just so few options. What I find is that if I can look early in the summer when the cream of the crop is looking [for a position] I can snag the most people.

Participant 3 reported similar experiences, noticing that there was not a lot of depth to the applicant pool. In contrast with the experiences of Participant 1, who believed that there was an overall shortage of high quality teachers with the desired qualities and characteristics, this Participant 3 considered the geographic location of the school to be a negative factor for attracting teacher candidates, noticing that often there would not be much, if any, choice from the applicant pool. Participant 3 stated:

From my perspective, at my current position as principal at [a rural school], the area, meaning geographically, our physical location is a not an area where you get a lot of applicants to begin with. I have worked at other schools in the county, so, I am referring to my particular area of the county only. The rural spaces get less applicants. I would not say this is accurate for every school I've worked at. Our biggest constraint for getting high quality candidates is geographic. People don't know to come here. They don't know what a great life there is out here. They don't see the resources; they see the limitations. This is because we are an hour and 15 minutes to an hour and a half from [the closest major city].

But this problem was not limited to the rural areas. The elementary school principals in the urban core also noted that there was a lack of participants interested in coming to some of the low performing schools. Participant 7 reflects on the efforts made in the urban core with regard to the depth of the talent pool, stating that:

Our district assigns teachers to the urban schools when there are not enough who apply to those schools. This is really a double-edged sword. Assigning me teachers, especially teachers who don't want to be in my school, is a real problem. These people destroy school culture because they don't want to work with the tough kids, the poor kids. But I lose my autonomy to build my school team and my culture when the district drops people into my school. I would rather have oversized classes than a teacher who doesn't want to be here.

Participant 3 believed that there were solutions to the problem of the limited applicant pool, but that there was a lack of support from district leaders to expand the recruiting practices and work with additional universities to attract more teachers.

Participant 3 went on to say:

So, you know we are closer to [another major university]. That university turns out teacher candidates, and it is a lot closer to us. It's only about 45 minutes to an hour away, but our district does not work with them as much as they should in recruitment. Even though I've asked for them to [go there to recruit teachers and participate in the job fairs], they have not [participated]. What is the reason for that? I have no idea. I've asked H.R. for the last five years since I've been back at

[the rural school] to please recruit more [from the major university southwest of the district].

Participant 3 continued reflected for a moment and then discussed the overall shortage of teachers in the United States:

I do believe that U.S. colleges of education, for some reason, have not grown in enrollment. This has diminished the number of teachers that the universities are turning out. It's possibly just because teachers aren't getting paid enough. That's kind of a system problem. Now, I do think it's bad everywhere but when I worked at a school that was more north in the county, I would get 75, 100, even up to 200 candidates sometimes, for a position at that school. I'm not exaggerating when I tell you this. Now, at this school, I'll get two or three. Sometimes, if I get 10, then five of them aren't even qualified for the position. And so, I really end up with very few choices.

A pattern emerged regarding the availability of applicants for a given open position. Participant 2 noticed that there were fewer candidates, overall, as well, but in addition, reported that many candidates who applied for teaching positions were not even minimally qualified. Participant 2 stated:

Sometimes [applicants] literally don't even have a degree. People will apply for a teaching position, and they don't even have a four-year degree, let alone [a degree] in education, or sometimes they do have a four-year degree, but it's not in education. They haven't even taken any of the tests they need for a temporary certificate; they have nothing.

Some participants reported using creative solutions to build a talent pool and develop their own workforce. Because several of the participants were not supported in their efforts to work with other universities, and the principals were not permitted to develop the relationships independently, the participants looked for ways to build a teacher pipeline locally. Some elementary school principals worked within the community to recruit individuals who might be interested in teaching, but who lack the appropriate credentials. Others looked within their school to find strong substitutes, support staff, and even spouse of teachers who might have been interested in teaching' For example, Participant 8 explained the approach that has been taken in the rural setting. This participant decided to recruit people who were working in her school or who were volunteers in the community to consider a career as a teacher. Participant 8 stated:

I have to do a lot of internal recruiting. I have to. If I have a great substitute that I think would be a good teacher, I coach them up and talk to them about how they can make more money if they went ahead and got a teacher certification. Or spouses of some of our current teachers, I talked to them if they're looking for work. You can talk to some of our stay-at-home moms who do have degrees; I recruit them to come back. Sometimes I can convince them to job-share because they don't want to come back full time.

Rural communities were not alone in the challenge to recruit teachers. In the urban core, school leaders were also recruiting individuals from the community to consider a teaching career. In addition, in the urban core, degreed individuals who were not education majors participate in programs such as Teach for America or City Year.

Programs, such as Teach for America and City Year, have brought young professionals into the urban core to teach for a short period of time. Because these individuals had not chosen a teaching career and were only teaching for a short period of time, elementary school principals have worked diligently to attempt to recruit from the group and retain those individuals in the teaching profession. Participant 7 noted that, “When I have a strong person from the program, or the teacher residency program from the college, I do everything I can to try and keep them in the [education] profession.”

In Theme 6, the challenges associated with the overall availability of applicants and the applicant pool were discussed, finding that there were considerably fewer qualified applicants for elementary school principals to choose from when hiring teachers. In addition, the strength of the available applicants, with regard to content area expertise, especially in the area of mathematics, was low. Due to these conditions, elementary school principals were challenged to find an adequate number of teacher candidates for any open position, with conditions in the rural areas in the bounded case under study being even more challenging with regard to the availability of applicants. In contrast, in the districts in the urban core, there was a greater number of teachers in the applicant pool, but many of the teachers did not wish to teach at the more challenging schools. This condition caused the district to place teachers into schools where the teacher may not have wished to work. These conditions, whether due to lack of applicants or forced assignment, often resulted in little choice from the applicant pool. The lack of choice had caused elementary school principals to sometimes choose a teacher who may have been underqualified, especially in the more technical content areas, such as

mathematics, or to deal with the challenges of staff who do not wish to work at the school. Due to these conditions, elementary school principals have developed strategies to identify and recruit individuals to the profession out of other support positions in the school, as well as from the community.

Theme 7: The effect of salary and other budgetary constraints on the talent pool. Overwhelmingly, the participants reflected that teachers do not feel respected. A pattern emerged showing that many of the participants believed that salary constraints were evidence of the lack of respect for the teachers. Participant 6 stated:

I do think salary comes into play. Sadly, even strong teachers do sometimes consider not staying in the classroom based on salary. But what I do find is for my strongest, most passionate teachers, salary is not a factor for them.

Participant 3 also noted the effect of salary, stating, “I don't know that salary has had a large effect, but unfortunately, I see it having a bigger effect in the future.” In contrast, some of the participants, especially those in the rural or outlying areas in the case under study noted that salary was not a factor. Participant 10 explained:

Some of my teachers don't think that the salary is that bad for the area. Here, where we are, there are not many jobs. The problem out here is frustration. And I have had many teachers at my school specifically mention that if they could make the same amount of money doing something else, they would do it. So, really, even in my area, it is more about frustration. They're also feeling very frustrated with their lack of steps. I can't remember the last time they got a salary increase or a step.

There were variations in the perception of the impact of salary constraints across the region. Some participants did not feel that salary constraints were a barrier for to teachers, however, in contracts, others believed that salary considerations, especially the lack of salary increases, was causing challenges with regard to the availability of teachers. Participant 9 provided evidence of the underlying salary constraints' The participant noted that, in addition to the low salaries that teacher received, there had not been salary increases given to teachers for as many as 10 years in some places. Participant 9 believed that teachers felt respected at their school, but the lack of increases in salary was a sign of being disrespected by the school district. Participant 9 stated:

It's not just the salary scale, it's the lack of raises over the last 10 years. And the lack of respect. I think they would say lack of respect, but they don't mean at the school level. They mean lack of respect at the district level. The teachers equated lack of raises from the district to convey the message that teachers are not respected.

Participant 4 also discussed teacher bonuses in addition to constraints in salary. I would have expected that teacher a bonus system would have been viewed in a positive light, but according to this participant, there was a negative connotation to a bonus. The participant described this negative regard that teachers had for a bonus. This was because a bonus represented a one-time event, rather than a salary increase which would recur year after year. Participant 4 stated, "They talk of giving teachers a bonus. That would be a one-time bonus without giving them an actual increase in their salary. It feels disrespectful [to the teachers]."

In contrast, several participants believed that the desire to teach outweighed salary and budgetary constraints. Participant 1 stated:

We are a high performing school. So, for my school, I think, that I draw passionate dedicated teachers. I cannot say that that is true for every school. But I do feel on my campus that budget constraints do not play a role. I think that the teachers are there because they want to be there.

Some of the participants, however, did not answer the question by discussing matters of money. Instead, several participants pointed to other factors that were causing constraints in the talent pool. A pattern developed around frustrations other than funding that the participants reported. In many cases these other issues came down to the teachers not feeling respected. Participant 5 described this lack of respect that teachers were experiencing, sharing, “I think, in my personal opinion, it is because teachers do not feel respected and valued. Parents don't really respect teachers anymore. The administrators don't respect teachers.”

Other participants determined that the lack of respect for teachers was driving dissatisfaction and caused teachers to feel undervalued. Participant 10 stated:

Well, the line that comes out of my district today is that if a parent gets a letter saying your child might be at risk of failing [the state assessment,] the parent then gets very upset. We try to tell the parent, ‘We're not saying your child is going to fail, we're just letting you know that they're a little below grade level.’ And then it's possible the parent calls the district. Then the district calls us, [and] tells us that we need to call that parent and apologize. [They go on to tell us] that the

parent is our customer, and they are always right. That is demeaning to teachers who were doing their very best professionally to help every student, and I really can't defend that.

A different example of the lack of respect for the teachers and the teaching profession was shared by Participant 7. Participant 7 described the frustration that teachers feel when there are changes in the legislation and standards causing upheaval of the curriculum. Participant 7 stated:

Lawmakers do not respect teachers. There's a level of respect that's eroded over decades. Well you know, like suddenly announcing that we're going to abandon Common Core, which we're not actually doing. That leads to uncertainty about what standards we will adhere to. And that uncertainty leads to stress.

Additional factors were reported by the participants, which led to teacher frustration. Participant 2 described factors aside from salary and standards, that held teachers responsible for matters that are not directly under their control' Participant 2 shared:

And then you know the constant laws about bullying, and that takes away from the focus of teaching and learning and puts more focus on a kind of defensive medicine. It's like a defensive medicine because we're having to constantly try to be careful to protect ourselves from liability. That's because there's such a ready-built willingness on the legislator's part to believe that kids are being bullied.

Many areas of frustration surfaced through the analysis of data with regard to the effect of salary and budgetary constraints. Salary scales were already low for the teachers

in the region, and the lack of salary increases for as many as 10 years in some districts caused frustration because the already low rate of pay was not increasing as the cost of living was increasing. The purchase power of \$100.00 in 2009 had dropped to \$84.22 by 2019 (Webster, 2020), which made teachers believe that their salary was decreasing. The participants described these frustrations with regard to the lack of raises because the lack of increases caused job dissatisfaction, which may have led to an unwillingness to do extra work or seek professional training. The salary conditions may also have been causing college students to choose majors other than education. However, there was variation in the perception of the teaching salary. In many of the rural areas, the perception was that the salary was better than it was for many jobs in the community, making salary constraints not a factor. Many of the frustrations were not directly related to funding, but rather to the increased responsibilities that were being placed on educators with regard to noneducational matters, such as bullying prevention. The combination of factors, both monetary and nonmonetary, were having effects on the frustration level of teacher and elementary school administrators in the bounded case.

Theme 8: Teaching background, educational experiences, and other lines of work in which elementary school principals had experience. Most of the participants did not have any work experience in a career or field that required an extensive background in mathematics or possessed a degree in applied mathematics. There was one exception, however. Participant 4 held a degree in economics. Participant 4 worked in a policy position for seven years. Although not a position that required applied mathematics, Participant 4 reported utilizing her mathematics background to predict the

return on investment of potential business plans as a basis for policy recommendations. Most of the remaining participants had been elementary school teachers prior to entering administration. Six of the participants had taught all the subjects, and two of the participants worked in a departmentalized setting, teaching only math and science. The remaining two participants reported that they had taught only writing, social studies or English and language arts. Each of the 10 participants expressed an understanding of the importance of mathematics, but the participants who had taught mathematics as a classroom teacher had a higher level of self-efficacy as an instructional leader charged with supervising mathematics in their school. Those who had not taught mathematics expressed their interest in being stronger in mathematics, with two participants having noted the limitations they have encountered as the instructional at their school without an adequate background to interview and select the best candidates and to supervise the content area' Participant 8 expressed her challenges with interview for mathematics opening. Participant 8 stated:

I do wish I had more experience with math. I was a strong reading teacher, and I am a good school leader, but I am not an expert in the math. I would know how to better select teachers and then support my teachers if I had more experience with those [math] concepts.

Participant 7 expressed a similar lack of comfort with supervising in the content area of mathematics, explaining:

I am fine as long as I am working in the primary grades, but as soon as I move into upper elementary, like fifth or sixth grade, even fourth grade, I panic.

Because inside I don't really know the math. If it looks like things are under control, and the kids are engaged in their work, then I am okay. If classroom management is spot on, and student engagement is high, I assume that the students are learning. Thinking about it like this, wow, what if the teacher is actually not teaching the content correctly? What if the teacher actually doesn't know the math? These poor kids!

Participant 7 went on to describe that when hiring an assistant principal for her school, she looked for an individual who was a former math teacher and assigned that individual to perform the evaluations and walk through visits for mathematics. By hiring to fill in a gap in content knowledge, this participant was able to assure a higher level of content oversight and supervision in the school. The participant also believed that on-site professional development could be conducted by the assistant principal to help strengthen instruction. In contrast, Participant 8 believed that there was not a pathway to address professional development and bring meaningful professional learning experience to the school. This was due to the lack of availability of appropriate training for teachers that could help solve this problem with mathematics content knowledge. Participant 8 also did not believe math content knowledge had been given a high enough priority. The participant expressed the need to seek out further assistance in developing an actionable plan. Participant 8 explained that the mathematics teachers did not have adequate content knowledge, expressing frustration with regard to the lack of availability of high quality professional learning experiences, stating:

I am fully aware that the teachers here are probably not strong enough in mathematics. This is what we have been able to get here because we are rural, and we aren't able to lure the stronger teachers to come all that way out here. I do understand the math well enough to know what is being taught correctly and when it is not. I can see this when I visit classrooms. But there is only so much I can do. I try to get teachers access to math professional development, but most of what is offered, if anything, just doesn't work. Half-day workshops don't work. We all know that, but that is what we end up getting offered. So, how do we fix it? I just don't know. I can't reteach every teacher the math myself. I am looking for good staff development options. I want to have stronger teachers, but there are so many conflicting priorities and demands. I can't teach them all the math myself.

Although Participant 1 did not hold a degree in mathematics or work in the business sector, the participant did have experience teaching mathematics. Similar to Participant 4, who held a degree in economics with a focus in mathematics, Participant 1 expressed a strong identity with mathematics, affirming that the background of the leader in the content area is important. Participant 1 brought out a point about availability of professional development. Participant 1 stated:

I look for candidates that are strong in math, and participants that already had Intel Math or are willing to sign up for it. I think that training makes a difference. I was a math teacher. I taught math. I know it [developing conceptual understandings] all starts in kindergarten. If we have poor instruction when they

are little, those gaps get wider and follow them all the way up. I know this because I saw it when I was a teacher. Then heaven help us! Catching kids up is a real problem. The kids are already defeated. How do you work with that? And if we let them out of elementary school without addressing this [weakness in mathematical content], it just gets worse. They will never be prepared for higher math.

Based on the data and experiences of the participants with regard to working in other fields or the participants who were experienced in teaching mathematics, most of the participants did not teach mathematics nor did most of the participants have workforce experience in a mathematics related field. The participants who did have other experiences with degrees that included a math concentration or experience in teaching mathematics had a higher self-efficacy for mathematics and felt better prepared as instructional leaders in mathematics. Some of the participants who did not have experience in mathematics reported challenges that they experienced in hiring and assigning mathematics teachers as well as providing supervision in mathematics classrooms in the role of instructional leader at their school.

Theme 9: Effect of the deficit in human capital management training for school administrators. There were a lot of similarities across the participants regarding formal training in human capital management. Most of the participants reported that they received little to no formal training both during their program of study at the university and during their time working in the school district where they served. The evidence

suggests that the deficit in training has caused difficulty for elementary school principals with regard to conducting interviews and hiring teachers' Participant 2 shared:

I did not have any formal training in any human resources or even how to conduct an interview. So, I have some core questions I ask, and my questions change as I do more interviews and get more data. You know, I probe.

Participant 6 appeared to be quite taken back when I asked her about training in human capital management or human resources. Puzzled by the question, Participant 6 stated:

No, maybe, you know, there were a few brief pockets where the [district administrators] talked to us about the law and leadership. You know about the process of hiring and how to discipline employees, but other than that, no. Ok, Ok. You know, and it's funny because in industry today there is so much human resource management. And, even in education [it is hard] to find a framework that looks at human resource management. This idea is troubling because we manage people all day. All day long you manage the adults; we manage the children; right, [you manage] the parents. You manage community partners. You know, I never really thought about that.

After a long and somewhat uncomfortable pause, Participant 6 went on to say:

That's good food for thought, though. It's very interesting because some of the most challenging things are your encounters with parents, or your encounters with other employees, or with employee to employee, and you've got to manage this.

Participant 1 also reflected on her lack of any formal training in human capital management. The participant considered the informal training experiences received since childhood, noting,

The H.R. training I had was at the dining room table when I was growing up because my father was a school superintendent. That was the training that I've had. That was the extent of my leadership training. But it got me to where I am now.

Participants also discussed the little bit of training in human resource management they had been provided over the course of their careers. The experiences of the participants were similar, with most agreeing that any such training had been minimal and had not been very beneficial. Participant 1 described some of the limited experiences:

Well so, with previous administrations [in the district], not with the current one, but with previous administrations, they at least spent one day at a summer leadership talking about human resource management. But it was very superficial. Every single year they talked about do's and don'ts, like the things that you should, and shouldn't say in an interview.

The reflection of Participant 7 further supported the lack of meaningful professional development in human capital management. Participant 7 stated:

I would say the training provided by the district has not helped me at all. Other than that, I have never been sued. So, does that mean that what they are doing for us is enough? Well, I don't know, but I have not ever been sued. I do not sexually discriminate or discriminate on any basis of disability. But no, [the training] has

not given me anything to home in on instructional or hiring decisions that will make for good instructional practices.

Two of the participants did have formal training in human capital management during their program of study. These two examples were discrepant cases and will be discussed in greater detail. Although the two participants did have formal training, there were great variations in both what the training experience was like and where the participants obtained the information. These two participants presented a different viewpoint than the other participants. I found a considerable difference in the content of the interviews with these two participants. There were differences in the depth of the application of learning between the two participants who reported having had formal training. The participant who received specific training as part of her university program expressed a depth of knowledge and systems thinking that stood out well above that of the participant who received district-provided human capital management training while on the job. Participant 5 stated that people management skills were critical. The participant went on to say that having specific and deliberate training in this area greatly influenced practice, especially with regard to the changing role of the elementary school principal.

Overall, there was a lack of formal educational experiences reported by the participants in the bounded case under study. The lack of formal training or training supported by the district beyond compliance issues has resulted in the presence of challenges in hiring and assigning teachers, especially in the content area of mathematics. Two participants who experienced robust formal training in human capital management

believed that the formal training has better prepared them for the challenges of managing the process of hiring and assigning teachers.

Theme 10: Recommendations and concerns with regard to hiring and assigning mathematics teachers. The final question from the interview protocol offered the opportunity for the participants to share any information that was considered to be relevant that had not been addressed through the other questions. Theme 10 emerged from the open-ended question, with most of the statements made by the participants having been related to policy considerations and concerns.

All participants noted some form of licensure or tightening up existing credentialing requirements would greatly assist with instructional quality in mathematics. Parallels were drawn to the reading endorsement that requires those teaching reading to have an endorsement, and for those who are not directly responsible for teaching reading to complete training specific to reading in the content area. Other participants discussed the endorsement for those who teach English language learners, explaining that a reading endorsement is now built into the preservice teacher education programs. The selected comments presented below help develop an understanding that the participants have similar viewpoints that policy should be used to address these issues, and that the preservice teacher preparation programs should take ownership for assuring teachers graduate with the skills that are needed. Participant 8 stated:

We have a reading endorsement, so when a teacher interviews with me, and I want to place them in a reading classroom, I know that they have mastery of the pedagogy and content. But I don't know that for math. We owe it to our kids to

fix that. These children are our future, and math is important. There should be a certificate or an endorsement, just like there is for reading, that lets me know that all the skills are there. Maybe they could even graduate with the certificate.

Participant 9 expressed frustration over the number of teachers who cannot pass the mathematics section of the teacher certification exam, stating:

We need to do a better job in the first two years of college. There used to be a course called math for teachers. The course at least made sure there was a minimum amount of content that the teacher understood. I used to know that everyone had that course, and that made me feel better. Now [there was a long pause followed by a deep sigh] now I just don't know what I am getting.

Participant 5 was concerned about competencies for human capital management in relation to qualifications to lead a school. Although this concern was addressed in Theme 9, it is important to note that this participant believed that principal preparation programs needed to be revised and updated. This participant believed the preservice programs that prepared principals for the job needed to be aligned with current demands. Participant 5 expressed concerns about preparation programs, stating:

Our prep programs are going to [need to] make a big sweep. Long gone are the days where [principal training is all about] the budget, books, and buses. We can learn that on the job. We need content-specific programs. We need programs that prepare leaders in the school whether it be specialist or whether it be assistant principals, principals, or curriculum leaders. We need them to have backgrounds

in people management and how we manage people, how to use their strengths to our benefit with kids and with each other.

The comments that were made by the participants all related to systems considerations that, if implemented, may be able to provide more in-depth preparation for both school leaders and for teachers of mathematics. It is important to notice that the suggestions and the possible policy changes are similar because each point addresses matters of more in-depth learning, both formal and on-the-job, that could contribute the strengthening instructional quality in the mathematics classrooms across the bounded case. Indicators of competency in human capital management with regard to hiring and assigning teachers, especially mathematics teachers, could be added to the course of study leading to principal licensure. Requiring these competencies to be included in the program of study could lead to positive outcomes for student learning across the bounded case.

The data were presented to address the three research questions in the context of the theme that were developed based upon the data. There is evidence to suggest that there is a gap in local practice with regard to a deficit in experience and training in human capital management processes. Further, the evidence suggests that there is currently no opportunity for elementary school administrators to participate in high quality learning experiences with regard to human capital management practices.

Evidence of Quality of the Data

For the findings presented in the results section of this study, it was important that methods were put in place that would ensure credibility of the data that were collected.

There are several accepted methods of assuring that data are credible. Among the established means are transcriptions and member checking. I followed the procedures from the research design so that the data that were the basis for the project were relevant and meaningful to address the identified gap in practice. Member checking and peer review proved effective to keep researcher bias in check. Use of member checking and peer review were put in place throughout the course of this study; the participants were assured that the meaning behind their words were being correctly interpreted. All interviews were transcribed and reviewed against the recording. Through member checking and follow up questions, I was able to clarify any potentially unclear statement made by the participants.

I followed the interview protocol that was developed and approved as the data collection tool for the study. Using the protocol helped to mitigate any potential bias. Further, I was deliberate when I asked probing questions so that I would not telegraph a disposition towards a particular way of thinking. When probing, I used phrases, such as “Say more about that,” or “What would that look like if.” This form of questioning allowed the participant to freely answer in an open-ended manner without feeling as though the conversation was being steered to a foregone conclusion or response.

Discrepant Cases

There were 10 participants in this study, and of the 10, only two of the participants reported having had any formal training in human capital management. Of the two discrepant cases, there were differences in the setting where the training for the participant was conducted. This is important to note because the evidence further

suggests that there is inconsistency in principal preparation programs even in cases where formal training in human capital management was provided. One participant identified training that was provided by the school district. That training was specifically designed to address human capital management principles. It is further worth noting that other participants from the same district did not recall having any specific training that met the criteria for human capital management training through their understanding of what should have been included to fit into that category.

Overall, the two outlying cases presented contrasting experiences between the participants who had received some type of deliberate and structured training in human capital management. However, there were also evidence of some consistent experiences. Both participants had greater self-efficacy for their role as a leader responsible for making human capital decisions. Additionally, both participants were able to express details of the processes that they follow with considerably greater depth than those who did not report having formal training in human capital management. I also observed greater consistency in the process that each of these participants followed in their decision-making process. I saw a more structured application of sense-making in the approach these two participants used in the hiring process. That consistency was evident regardless of the position that was being considered'

All but one of the participants in the study reported experiencing the principal preparation program by getting an advanced degree in school leadership at a local university in the state where the study took place. The only participant who reported formal training in human capital management as part of the program of study at the

university received that training and completed her coursework in a different state from the state where this study took place. The influence that the formal HR training had on the career development of leaders makes a compelling case for including it in principal preparation and educational leadership programs.

Summary

Discussion

There was a problem with student achievement in mathematics in the bounded case under study in a Southern state. One of the possible factors contributing to this problem was the considerations that were made by elementary school principals when they were hiring and assigning teachers to provide instruction in mathematics. The purpose of this study was to understand factors elementary school principals considered when hiring and assigning mathematics teachers as well as possible budgetary and other constraints that may have affected the depth of the applicant pool and related staffing decisions. To study this problem, I developed three research questions to learn about the background and perceptions of the principals who were leading elementary schools in the bounded case under study in the areas of a) human capital management, b) educational background and teaching experiences, and c) considerations and constraints that were factors as the principals hired and assigned teachers. I used a qualitative case study method that allowed me to understand the perceptions of the participants through their lived experiences. In this qualitative case study, I collected data through interviews with 10 elementary school principals who were responsible for hiring and assigning teachers. I conducted interviews until I reached the point of saturation. I determined that I had

reached saturation when I was no longer learning new information or perspectives to support the research questions.

Each of the 10 participants was experienced educators, having had both classroom teaching experience and leadership experience on their journey from teacher to school administrator. Every principal interviewed expressed empathy for the students, especially those who lived in challenging home environments with an absent parent for reasons ranging from drug abuse and incarceration to active duty military service. In addition, each of the participants related the school experience as a critical factor that would be able to change the course of the life pathway for their students. Each expressed that education would equip the students with knowledge so that the students could improve their lives and address the socioeconomic conditions of the communities where the students lived. All participants expressed that education was the means by which a student could improve their lives and address the challenges of life in a rural environment or life in the urban core in areas where high crime rates presented numerous problems. Each of the principals revealed a strong desire to see every student in their charge succeed and each worked tirelessly every day to set the best possible experiences for the students in their school. Every principal wanted to see high quality instruction in every classroom, every day, and did their best to staff their school with the most talented teachers available. As I conducted the interviews for this study and analyzed and coded the data, 10 themes emerged. These themes included 1) wide variation across the schools for the structure of the master schedule for departmentalizing teaching responsibilities; 2) variations in the strategies used for assigning teaching responsibilities; 3) decisions made

around the social and emotional consideration; and the influence of those considerations on teaching assignments; 4) the priority for placing emphasis on content knowledge or other factors; 5) variations in the actual process of conducting interviews; 6) the characteristics of the applicants in the pool; 7) factors with regard to budgetary and salary constraints; 8) the teaching background and career pathways of the participants; 9) the formal education and on-the-job training that was available to the participants; and 10) other factors expressed by the participants, such as policy recommendations.

There was substantial importance with regard to the findings. As the findings were framed into themes, it became apparent that there was a problem with principal preparation. From the nature of formal education and experience in the workplace, to the way each participant carried out practices related to hiring and assigning teachers at there school, it became evident that there was a gap in local practice. The major findings are presented as a summary in the pages that follow.

There were some similarities across the sample of the principals who participated in the study. An example of one of the similarities was that all of the participants were leading schools in a region of a Southern state, and that some form of departmentalization or teaming was implemented at the school they were leading. Another example was that each principal worked to structure the school day so that students had received the best academic experiences. Although all principals were working towards the common goal of student achievement, there was great variation in the way that the school day was structured. Some principals chose to begin departmentalizing and teaming as early as the second grade, however, in contrast, other did not begin departmentalization or teaming

until as late as fourth grade. In sharp contrast, one school principal reported that departmentalization would no longer be practiced, but faculty pushback caused a reversal of that decision. Although the grade levels and strategies varied, in each of the schools there was some method of content-specific teaching assignments being made in the elementary school, in contrast with a traditional elementary school setting in which each teacher taught every subject to all of the assigned students.

The literature revealed that there are two predominant positions when making a case for or against teaming or departmentalizing in elementary classrooms (Bastian & Fortner, 2018; Eichhorn & Lacson, 2019; Fennell, 2018; Fryer, 2018; Webel, Conner, Sheffel, Tarr, & Austin, 2017). Some of the evidence suggests that elementary students benefited from a self-contained classroom so that the needs of the whole child would be attended to through the development of relationships that were more nurturing than what would be developed in a departmentalized or teamed setting (Bastian & Fortner, 2018; Fryer, 2018). In this case, students were assigned to more than one teacher, spending time each day with each of the teachers. Other evidence that emerged from the data suggested that departmentalization or teaming was of greater benefit to the students than having just one teacher, which was found to be consistent with the literature (Eichhorn & Lacson, 2019; Fennell, 2018; Webel et al., 2017). This finding is significant because the finding suggests that each of the teachers would have been better prepared with expertise in a content area. This expertise would have made each teacher better prepared to equip students with the skills that were needed for success as the student progressed through the grade levels. This was thought to be true, especially in the content area of mathematics.

This claim, however, has been the subject of much attention over time. As evidenced by low student achievement in mathematics, with the recent results of national assessments reporting stagnant or declining proficiency (National Center for Educational Statistics, 2019), the notion of inadequate content knowledge of the teachers who were given assignments to teach mathematics must be considered. From seminal studies to the more current, the literature consistently reveals a lack of teacher content knowledge in mathematics (Blazar, 2015; Botha et al., 2013; Carney et al., 2016; Clarke et al., 2015; Ball et al., 2008; Ma, 2010; Sax et al., 2015). Teacher content knowledge in mathematics and staffing considerations are critical elements that must be addressed if student achievement and proficiency will be expected to increase in the future. Further, these issues cannot be held in isolation when considering the factors that elementary school principals consider when hiring and assigning teachers. These ideas were explored in detail in the data analysis through Themes 2, 3, and 4, which addressed strategies for assigning teachers, social emotional considerations, and considerations with regard to content expertise. The major findings for these themes are summarized below:

Evidence from the broader literature suggested that there was little consistency across the country. In most areas of the country, teaching assignments in elementary schools were still being made using a variety of strategies, including a generalist model with mostly self-contained classroom structures, a departmentalized model where most classrooms are structured with teaching assignments based upon content area specification, and a mixed model where a blend of both structures existed, with content area specific teaching assignments beginning in the fourth or fifth grade and higher

(Parker, Rakes, & Arndt, 2017). The local data discussed in Theme 1 suggested that there was general consistency across the region with regard to the approach for structuring the elementary school in terms of master schedule development. All schools in the bounded case reported some sort of structure that indicated that at least some consideration was given to content knowledge when making master schedule construction decisions.

Participant comments support the implementation of self-contained, teamed, or departmentalized structures in their schools. Although there were similarities and differences in the school schedules, the next step for all of the principals was to review the current teaching staff and decide about placement. Once the principal made the decision about the structure that would be in place at their school and assigned existing staff, the principals turned their attention to the process that would be used to hire for the open positions.

In addition to a lack of structure in the approach that the participants in the study had taken with regard to their fundamental belief about the preferred structure of the schedule, I further found that there was little consistency in the interview process. These data were analyzed in Themes 5 and 6. Across the region, there were no consistent processes in place with regard to a standard protocol for interviews in general. Further there were no protocols for content specific questions, whether in mathematics or in another content area, such as science or social studies. Although it was not surprising that there were no consistencies across the bounded case, because the sample consisted of elementary school principals from multiple school districts, it was surprising when there was more than one participant from a single school district. I would have expected that

there might have been a standard protocol which was used by schools in the same district. One similarity emerged with regard to the screening process after an applicant was recommended for hire by the principal. All districts within the bounded case had a process in which the human resources department provided screen of applicants, these screenings were compliance-based to assure that the teacher candidate held the minimum certification criteria for the position. Background checks were also performed centrally in each of the districts in the bounded case.

Further analysis of the data also revealed the presence of some personal bias and personal preference on the part of the principal when hiring and assigning teachers. This bias was based upon the closely held beliefs of the principals with regard to what the overarching goal of elementary school was for students. There were differences in the data that were reported by the participants. Some participants believed that the purpose of elementary school was to teach all students to read, and that literacy was the most important skill that students needed to have before the students moved on to the junior high or middle school. In contrast, others believed that students needed to leave the elementary school experience with all the skills across the content areas that were needed to progress into the secondary school setting. Across the bounded case, the hiring and assigning of teachers was highly influenced by the beliefs about the goal of elementary school that was held by the principal. The evidence to support those beliefs came across through the decisions that were made with regard to the implementation of scheduling structures, decisions about departmentalization, and for the implementation of high-quality instruction in mathematics.

I found these conditions were further complicated by the lack of basic training in human capital management that the participants encountered on their journey from teacher to school administrator in the bounded case. The data regarding the preparation for the school principals were discussed in Theme 9. Shortcomings in preparation were discovered and were generalizable across the sample. The participants in this study did not have the opportunity to participate in relevant, job-embedded professional learning experiences or professional development that was specific to hiring and assigning teachers or interview techniques and strategies. Nor, with the exception of one participant who was trained out of state, did the university experiences of the participants include relevant training in the area of human capital management. Rather, in both settings, formal education and in-service professional development was framed around compliance and ethical issues in the interviewing and hiring processes. There was no evidence that a comprehensive and consistent approach or a framework related to human capital management existed in the bounded case that would provide support in the area of hiring and assigning teachers. Further, in the area of professional development, experiences were largely compliance based, not just in the areas of human capital management, but also in the area of supervising in a content area. In addition, few collaborative experiences were available for the participants, and those that existed were not developed to increase proficiency in either hiring and assigning teachers or deepening content knowledge to improve instructional quality through supervision of instruction.

Through the process of conducting this study and interviewing participants, I was deliberate to listen for indications that the participants relied upon the existence of a

credential that served as an indicator of minimal competency or proficiency in any given subject area. This area had policy implications which were reported in Theme 10. I found that school principals did discuss the reading endorsement that teachers in the bounded case were able to obtain through professional development. Another available endorsement in the bounded case was for teaching English language learners. The existence of the reading endorsement and the English language learner endorsement provided strong indicators for principals with regard to the minimal competency in literacy. Participants mentioned those endorsements, coupled with data, when considering hiring and assigning teachers in general. Participants relied upon the endorsements and certificates as an indicator of adequate background knowledge and competencies for the subjects that are certificated or endorsed. For content areas without such a certificate or endorsement, such as in the content area of mathematics, the elementary school administrators did not have a validated indicator of subject area competency. Therefore, the only indicators that principals had available to help assess the competency of the teachers were high stakes assessment data, self-reported descriptions of the teacher candidates' approach to teaching mathematics, and a portfolio of professional development experiences that the teacher candidate had undertaken, without any indicator for the successful completion of such training.

Barriers, such as salary and budgetary constraints were discussed in Theme 7. Although teacher salaries in the bounded case under study are considerably lower than the national average, as discussed in the Section 1, salary limitations did not emerge as a barrier in the process of hiring and assigning teachers. Overall, the principals did not

consider salary to have been a barrier. In addition, budgetary considerations did not present a barrier, either. In most cases, the principals considered the classrooms to be well equipped with the required materials to meet teacher and student needs. This may have been due to the Title I status of the majority of the schools that were represented through the study. Instead, the challenges and barriers reported by the principals included working conditions, such as lack of support from the district, a perceived lack of respect from stakeholders, and an abundance of paperwork that was required to document compliance with statute. Teaching pays less than a career in applied mathematics and computer science, however the impact of salary considerations on the available applicant pool regarding the selection of a college major and career was beyond the scope of this study.

Conclusions

Through this study, I was able to draw several conclusions about the considerations and constraints that school principals consider when hiring and assigning teachers. The most significant finding based upon the identified local problem was with regard to an identified gap in practice in the preparation of school principals in the bounded case. The gap in practice that emerged may be the root cause of the local problem. With regard to the applicant pool, I was able to make conclusions in the areas of general availability of applicants, availability of applicants with a strong mathematics background. Regarding principal training and preparation for their role of instruction leader for human capital management, I drew conclusions about the nature of both preservice and inservice training for the areas of content development, collaborative

practices, and systematic approaches to hiring and assigning teachers. In the area of policy, I was also able to draw conclusions in both teacher preparation programs, administrator preparation programs, and the certification and endorsement tracks for preservice teachers. These detailed conclusions are presented below.

Availability of applicants. Across the region, there were sharp variations in the number of applicants for any given open position. Most of these variations were due to the geographic or socioeconomic conditions present at the school where the job opening existed. Rural communities had the least number of applicants for any given position. Urban schools with low socioeconomic conditions tended to attract fewer applicants as well. Further, the data indicated that the low compensation of teachers was not a critical limiting factor in the availability of teacher candidates from the available pool, both with inservice teachers wishing to change schools and with preservice teachers interviewing for their first teaching assignment. The limiting factor regarding the availability of elementary teachers with strong content knowledge in mathematics was not addressed in this study; however, other indicators and evidence suggest that those with a strong mathematics background or strong self-efficacy for mathematics do not choose a career in elementary education, but rather enter a STEM occupation with higher wages (Epstein & Miller, 2011; Nix, Perez-Felkner, & Thomas, 2015; Sithole et al., 2017). This condition could have been a limiting factor in the overall depth of content knowledge for the available applicant pool, both for in-service and preservice teachers.

Principal preparation. In the bounded case under study, as reported by the participants, few experiences were available to aspiring school administrators that would

have provided the development of competencies in human capital management. I found this condition to be true for both preservice programs and for inservice professional development opportunities. Principal preparation programs did not provide adequate coverage of practical matters that would build confidence and competencies in human capital management. No participants trained at an institution of higher education within the bounded case reported any postbaccalaureate experiences in human capital management or interviewing protocol. The only report of such training occurred at a university that was outside of the state of the bounded case. There were no assignments reported during which existing frameworks for human capital management, especially in the area of hiring and assigning teachers, were studied. The formal education in leadership did include training in education law, but the focus of these classes was on what to do to avoid violating a law, rather than how to apply the law to practice.

Once a teacher obtained a degree and applied for an administrative position, district-based leadership development programs existed within the region. Although these district level leadership development programs existed in the bounded case, the programs leveraged similar themes, constructed around ethics and the law, what not to say in an interview, and examples of outcomes when these premises are violated, with regard to the legal process and what the ramifications are on the licensure of a principal found in violation of statute or regulation. Once an individual was hired for a leadership position within a school, most of the practical training about hiring and assigning teachers came from the school principal. Some individuals sat in on interviews, but, in contrast, others were expected just to start conducting interviews and hiring teachers. Individual

participants were mentored by their principal, with varying degrees of depth, depending on the individual principal, or the aspiring leaders learned from personal experiences and from family members and friends who were in the field of education.

Once an aspiring principal was assigned to run a school, little changed in the nature of professional development experiences that were available to the leaders, and experiences were not differentiated. Most professional development experiences were structured with a focus on reporting, budgeting, and assessing both student learning and teacher compliance. These areas included understanding things like statutory implementation of new state policies, preparation for state assessments, expectations and reporting requirements for varied local initiatives, such as walk throughs, and how such data were to be collected and reported. Trainings were procedural in nature.

The final question that I asked each participant was open ended. I asked each participant to share any other thoughts or comments that I had not specifically asked about. A theme emerged from that open-ended question. Many of the statements that the participants made were related to policy. From the data, I synthesized the ideas of the participants into a few ideas regarding possible policy changes. Based on the evidence from the participant interviews, review of the literature, review of the local data, and review of current statutes, I have concluded that changes to teacher licensure, especially in the content area of mathematics, could potentially lead to higher student achievement in mathematics. For elementary educators, there are three levels of general certification: elementary education (kindergarten through fifth grade); prekindergarten through primary (age three through third grade); and preschool education (birth through age four). In

addition to the basic certification, specific endorsements could be attained. Currently, there exists a state level endorsement in reading and requirements for those providing instruction to students who are identified as English language learners, as discussed earlier. These endorsements that applied to all grade levels, from kindergarten through the twelfth grade. There are a total of 10 coverages that are structured as K-12 subject area coverage and, in addition to reading and English Language Learning, including a) art, b)athletics, c) computer science, d) dance, e) health, f) humanities, g) music, and h) physical education (Florida Department of Education, 2019). At the middle school level, there are four areas of coverage, all providing coverage for fifth through ninth grades, including a) English, b) general science, c) mathematics, and d) social sciences. For high school a vast array of both academic, subject area coverages existed, as well as career and technical coverages. Further, administrative, professional, and exceptional student coverages exist (Florida Department of Education, 2019).

As principals are hiring and assigning teachers, decisions were being informed by whether or not a teacher candidate held one of these certificates or endorsements. These credentials were considered to be a reliable indicator of the appropriate level of competency to provide high quality instruction in literacy. These endorsements also served as an indicator to assure a teacher without these credentials was placed on a pathway leading to the obtainment of the credential so that teachers were not considered out of field. From these indicators discussed earlier, along with the data that were collected through interviews, it is apparent that principals consider credentials when hiring and assigning teachers

Recommendations

Based upon the data that were collected from the interviews in this study, I have identified several gaps in local practice that were actionable. From the data, there was an immediate need for professional development for elementary school principals with regard to hiring and assigning teachers. The details for this professional development project appear in the implications section, below.

Further, based on these data, there are also longer-term systems changes that could be considered that could potentially lead to greater student achievement. These include restructures to structure of formal preservice preparation programs, and additional certification or endorsement pathways for teachers. Those recommendations are described below, followed by the description of the project that could serve as an immediate action to begin to close the gap in local practice.

First, regarding principal preparation programs, a review of the current curriculum could be undertaken in a collaborative setting between the local universities where teacher preparation programs reside. In this setting, a review of the literature could occur with the purpose of comparing emergent best practices in school leader preparation with the currently practice and framework of the current programs. Because the principal was no longer operating in the role of building manager, but rather the role of instructional leader, I would further recommend that courses content-based instructional leadership be developed, tested, and implemented.

Further, because education is a people business, I would further suggest that there be a semester long, standalone class in human capital management in education that is

based upon a research-based framework, such as the strategic management of human capital in public education (Odden & Kelly, 2008). During this semester long course, I recommend that all scope and aspect of human capital management would be studied through the lens of business practices that are proven effective and could be applied to the educational setting. In addition to a review of the preservice leadership preparation program, I would recommend a review of inservice professional development that is available for both teachers who are aspiring leaders, assistant and vice principals who are new on their administrative career journey, and for veteran principals who may have been trained before the shift toward departmentalization in the elementary school setting became prevalent.

I would recommend that a collaborative and job embedded approach be taken to the design of this professional development pathway based on proven effective strategies (Darling-Hammond et al., 2017; DuFour, 2004; Fuller & Hollingworth, 2014), and that the collaboration be implemented through both peer to peer encounters and collaborations, as well as a multilevel structured learning community approach. In this approach, aspiring administrators, district level administrators, and school principals would be grouped together to provide an environment of traditional and reciprocal mentorship.

Additionally, I would recommend that a new endorsement be developed at the state level. This endorsement would provide coverage for mathematics for those who will be teaching kindergarten through the fifth grade. This endorsement would align with the current level of elementary certificates available. By developing a new endorsement in

the subject area of mathematics, principals who are hiring and assigning teachers to provide instruction in mathematics would have a screening tool that could be used as an additional data point and an indicator that the teacher candidate possess competencies aligned with the required subject area content knowledge in mathematics. This screening tool would be used in much the same way that elementary principals were able to use both the reading endorsement and the English language learner endorsement to appropriately hire and assign teachers.

The recommendations described above represent longer-term program and policy changes that could help assure that people come away from their formal education with a stronger set of skills to improve student achievement, however, the data indicate that there is an immediate need to empower the people who are currently leading our schools. Based on those data, as reported in the analysis, the most appropriate action would be to develop a 3-day professional learning experience with ongoing, job embedded follow up tasks over the school year to begin to close the gap in practice regarding the hiring and assigning of teachers. This project is detailed and described below. The full project agendas, timelines, and assessment tools can be found in Appendix A.

The Need for Professional Development

Based upon the data I identified a gap in practice with regard to the availability of professional development for elementary school principals' This professional development was designed to introduce a framework to school leaders that would help the principals develop strength and understanding of a full cycle of human capital management including hiring and assigning teachers. A content-focused strand included

in the professional development to build awareness of the mathematical content and develop the principals understanding of critical key concepts and how to interview to bring out the strengths of potential teacher candidates. Finally, the professional development fostered collaboration and team building to bring principals together in a job-embedded and ongoing manner to strengthen the learning community and build authentic collaboration. The full project is presented in Section 3.

Section 3: The Project

Introduction

The development of this project was directly based on the study that I conducted. I obtained the data in this study by conducting interviews with the principals of 10 elementary schools in the region under study to learn about the constraints and considerations that elementary school principals consider when hiring and assigning teachers. After conducting research to study this practice as well as compiling and analyzing the data, I designed a professional development project to support school principals and other administrative leaders in their development as instructional leaders in areas related to human capital management with the purpose of providing elementary school administrators with the strategies that have been designed to lead to improved quality of instruction in elementary mathematics.

Rationale

Project Genre and Rationale for Professional Development

Through this study, I learned that the principals in the bounded case under study had received very little, if any, formal education in human capital management or in human resource management. Due to those circumstances, most of the participants in the study believed that they were underprepared to carry out some of the aspects of their position as a school principal. Based on the evidence from the study, the genre for the project was professional development.

The rationale for the selection of the genre of professional development for this project was due to analysis of the data that were collected during the study. The lack of

formal training possessed by many of the participants in the study helped me learn that a strong professional development experience would help the principals frame their behaviors in hiring and placing teachers with a greater focus on the need for global competitiveness and how professional development standards under the Every Student Succeeds Act of 2015 (ESSA) could be supported to give principals a strong learning experience.

In addition, because the role of the principal has changed over time, the literature review revealed that, in many ways, principal preparation and principal professional development have not changed in a way that supports the demands of the shifts that have occurred in the role of the principal. Through a professional learning experience such as the one that has been developed for this project, principals will be able to collaborate around topics that are important as they consider the human capital management aspects of their position as it relates to content area learning.

Review of the Literature

In Section 1, I presented a review of the literature to delve into the role of the school principal as an agent of human capital management. Further, in the first literature review, I presented findings that summarized the status of instruction in mathematics in elementary schools in the bounded case under study. This literature review was accomplished through a comparison of data describing the state of teacher content knowledge in mathematics and a framework for human capital management for instructional leaders such as school principals. The presentation of the literature review guided the formation of the problem of practice.

For the second literature review, I researched the characteristics of professional development for adult learners and applied these characteristics to the professional development activities that I created for this project. This review was aligned with the identified need and the gap in local practice that had surfaced after the analysis of the data. The review of the literature that follows describes the elements of effective learning conditions for adult learners. I considered the following characteristics: (a) active learning, (b) collaborative learning, (c) data-driven professional practices, (d) the application of content knowledge to instructional leadership, (e) sustained professional learning, and (f) job embedded professional development. I then reviewed the literature that specifically applied to professional learning for school administrators.

To conduct this literature review, I searched using the available resources through the Walden Library, including ProQuest, ERIC, and the SAGE Journals search. I also used Google Scholar. I conducted keyword searches in two stages, first using general words and phrases, including *professional development*, *professional learning*, *teacher professional development*, *teacher professional learning*, *job embedded professional development*, and *adult learning*.

To find literature that was relevant to adult learning, I began with a focus on effective professional development for adult learners. After beginning with professional development for adult learners, I found that the results for the search were far too broad, extending into fields that had little relation to education or school leadership. Based upon that experience, I anchored my search by using the keywords *best practices in adult education for school leaders*. This provided a more tightly aligned search that yielded

articles and studies that applied to the educational setting. I further expanded the search to include terms such as *human capital management, instructional leadership, active learning in adult professional development, leadership professional development, principal professional development, principal leadership in mathematics, and professional learning in human capital management in education*. To review the literature to find approaches to adult learning and professional development that have been proven to be nonexamples, I searched on terms such as *ineffective methods of professional development, and ineffective methods for adult learning*.

Further, to learn about the specific professional development for school leaders, I needed to narrow my search. To access literature specifically addressing principal professional learning, I conducted searches using keywords such as *principal as a lead learner, professional development for educational administrators, principal professional learning, principal professional development, and school leadership professional learning*.

With all keyword searches, once I identified relevant articles, I used the feature in Google Scholar for related articles so that I could find out what studies had been done by others on similar topics to locate literature that was built upon the findings of others. Similarly, I expanded my review of the literature to include those who were citing the work that I found in my initial searches by using the “cited by” feature of the search engine. These strategies allowed me to expand my searches and find relevant research on the topic of adult professional development. I searched the literature was searched to the

point of saturation. Saturation is reached when new searches yielded information that was similar to information that had already been reviewed (Randolph, 2009).

My initial search results provided information that allowed me to see that professional development in education is a global topic. Schools across the globe are working on professional development as a strategy to improve and reform (Choy & Chua, 2019). The key to high performing school lies in the development of school leaders, including skills in the ability to effectively select and develop teachers and to implement systems and structures to align with effective outcomes (Choy & Chua, 2019). Context is also a critical component of professional learning because context allows the learner to link the theory to practice addressing a current situation or challenge in the school setting (Darling-Hammond et al., 2017).

Professional Development

There are several definitions of professional development, and the concept of effective professional development has changed over time as researchers learned more about best practices. Although the education system was operating under the guidelines of the No Child Left Behind of 2001 legislation, availability of short, one-shot professional development experiences were increased, such as one-day bootcamps or after-school workshops; however, simultaneously there was a decline in programs that were sustained over time or job-embedded (Wei, Darling-Hammond, & Adamson, 2010). ESSA was enacted in 2015, and with it came new guidelines for professional learning. Under ESSA, professional learning was redefined to require the implementation of professional development programs that “improved teacher, principal, or other school

leader effectiveness” (Every Student Succeeds Act, Title II, 2103[a][1]). With this new legislation in place, the criteria for effective professional learning were broadly redefined.

In the age of ESSA, professional development was redefined as “structured professional learning that results in changes in teacher practices and improvements in student learning outcomes (Darling-Hammond, et al., 2017). Based on a review of the literature, a framework was developed that synthesized best practices in professional learning for adults. This framework structured and consolidated the best practice and summarized the qualities of professional development that were effective. The seven key elements that emerged from the work were considered to be critical for quality professional development (Darling-Hammond, et al., 2017). These characteristics were the basis for the design of this project. The project:

- was content focused and data-driven,
- was active,
- was collaborative and job embedded,
- modeled effective practice,
- provided coaching,
- offered a feedback cycle, and
- was sustained.

Qualities of Effective Professional Development

Effective professional development has a focus on content, is situated within a specific discipline, and incorporates elements of pedagogy within that content area.

Active learning is infused into the learning experience, moving away from lecture, and it

is as authentic as possible, using artifacts and interactive experiences to contextualize the learning. Collaboration through job-embedded learning is another key factor, as school culture has been shown to improve in this setting. Modeling effective practices is another factor of effective professional learning, with rich examples through peer teaching, student work samples, and video case studies. In effective professional development, access to coaching and support from experts, with a focus on the individual needs of the learner, makes the learning personalized, and permits great individual growth. In addition, there are many opportunities for learners to think about their experiences and receive feedback. Finally, effective professional development is ongoing and sustained, leading to meaningful changes in practice.

Content focused and data driven. There has been a shift in culture towards a strong sense of accountability in education. Measurement and assessment provide benchmarks by which success is determined for student learning gains as a result of classroom instruction. For professional learning experiences to be relevant to the educator, it was important for this project to connect data to the need for the professional learning that was going to be provided. Access to vast quantities of data has reshaped the field of education, as well as professional learning practices. Data in education are changing both what is counted in education and referred to as effective, as well as what is affective, relating to the expectations for how practices are tied to dispositions to achieve these outcomes (Lewis & Holloway, 2019). Currently, data drives every decision in the school setting, bringing about a data-driven culture (Buchanan & McPherson, 2019). Professional learning that will ultimately effect student achievement should be focused

on the content that is applicable to the specific context that is being addressed, and it should be specific to the area of discipline, such as mathematics (Darling-Hammond et al., 2017).

Active learning. For centuries, learning has been described as active, with a Chinese proverb stating, “I hear, and I forget. I see and I remember. I do and I understand” (Confucius, 2019). Three types of learning: observational learning, implicit pattern learning, and perceptual and motor learning have been identified by the National Academies of Sciences, Engineering, and Medicine (2018). It is important for people to take control of their own learning (National Academies of Sciences, Engineering, and Medicine, 2018). Effective professional development should be designed with the learner in mind, moving away from lecture as the predominant vehicle for delivery (Darling-Hammond et al., 2017). To accomplish the design of effective professional learning experiences, design principles that all the learner to self-regulated are important, allowing the participant to manage their personal learning goals through metacognition, strategic action, and their own motivation to learn (National Academies of Sciences, Engineering, and Medicine, 2018).

Collaborative learning practices. The school setting is designed for collaboration between teacher teams, administrators, and coaches; therefore, to be highly effective, it is important that professional development experiences are designed to follow a collaborative model (Darling-Hammond et al., 2017). There are many ways the design collaborative professional learning, including professional learning communities, and Benchlearning which are discussed below.

Collaboration through professional learning communities. The concept of professional learning communities has evolved over time since the seminal work of DuFour (2004). Professional learning communities are a method of job embedded professional development that were initially focused on three big ideas which included a) guaranteeing that all students learn; b) creating a collaborative culture; and c) emphasizing results (DuFour, DuFour, Eaker, & Many, 2006). Because of the earlier work of DuFour (2004), the expanded goals of a professional learning community are a) focused on learning; b) collaborative in nature; c) inquiry based; d) centered on a continuous improvement model; and e) action oriented with a focus on results (DuFour & DuFour, 2013). Key elements that empower participants to have a successful professional learning community as a follow up to professional development included a) identified leadership roles; b) personalized learning; c) established guiding principles; d) organizational support; e) social learning; and f) purpose (Andrews & Richmond, 2019; Horrocks, 2019).

Collaboration through Benchlearning. A model of collaborative learning being brought into the education space from business was Benchlearning, which was originally designed to combine aspects of operations with human factors to bring about the best possible outcomes (Aas & Blom, 2018; Karlof, Lundgren, & Froment, 2001). In the business setting, Benchlearning has been proven effective to improve efficiency and job satisfaction (Bengt, Lundgren, & Edenfeldt-Froment, 2001; Karlof et al., 2001). Currently being applied in the educational setting, Benchlearning deepens the current understanding of collaborative learning. Benchlearning is a process that connects

systematic and integrated performance comparisons as measures of learning and is used to identify good practices based on indicators (World Association of Public Employment Services, 2017). As a national initiative being implemented in the Scandinavian countries of Norway and Sweden. It is based around authentic practices and targeted towards professional learning for school principals with a goal of developing new and innovative leadership practices by working through theoretical inputs to develop shared experiences by school visits, formal training, and piloting new ideas with a deep reflective component (Aas & Blom, 2018). Even though this is a new model that is being applied in the educational setting, early findings suggest that the reflections about the authentic practices and the willingness of participants to try new things in a change process are evident, and that principal self-efficacy and motivation are also increased (Aas & Blom, 2018).

Job embedded. Job embedded professional development emerged as a highly effective model. There were many studies occurring around the world exploring similar themes and concepts in adult learning in the educational setting. Job embedded learning emerged as a strong method of professional learning across several studies. A quantitative study was conducted to gauge characteristics of professional development that were considered to be effective by surveying adult learners about their perceptions of professional development various models finding that mentoring and was ranked most effective, and the presentation of materials through an online platform were found to be least effective (Abu-Tineh & Sadiq, 2018).

Models effective practice. In highly effective professional learning, especially in professional development for teachers, modeling is a strong practice that supports student achievement as well as teacher learning. There are many ways to incorporate modeling into professional learning, including (a) a review of case studies, (b) peer observation, (c) demonstration units and lessons, and (d) sample materials and work samples (Darling-Hammond et al., 2017). A recent study by the Society for Research on Educational Effectiveness (Gallagher, Arshan, & Woodworth, 2016) found that professional learning that included a focus on both the educator and a set of materials to learn from led to strong learning gains in students. These findings have implications for program development and professional learning in other contexts due to the success of this model. (Gallagher et al., 2016).

Provides coaching. Ongoing coaching after a professional learning experience is a highly effective method to drive a strong implementation of new practices learned. Expert support in professional learning has been found to play a critical role in the implementation of new learning supported by participation in high quality professional learning experiences (Darling-Hammond et al., 2017). In one study, coaching for teachers and school leaders was studied where a systematic analysis of the processes in coaching were explored as a model of professional development, with results that suggested positive outcomes in teacher and leader retention were improved when given access to coaching (Lofthouse, 2019). In addition, the expert scaffolding that is provided in a coaching situation has led to a higher likelihood of the implementation of a new skill or tool from the professional learning experience (Darling-Hammond et al., 2017).

Reflective practice. Another characteristic of high-quality adult learning experience is inclusion of time for the process of reflection and sensemaking in a rapidly changing world. Feedback is also an essential area as based on adult learning theory (Darling-Hammond et al., 2017). There are high expectations for school leaders to be able to embrace new practices across many areas of school improvement as they are simultaneously making judgement calls that effect learning (Bøje & Frederiksen, 2019). In the content of adult learning for school administrators, as they develop as professionals, there is a shift that occurs in their own identity as they move from teacher to leader (Bøje & Frederiksen, 2019). It is important that adequate time for reflection on practice is provided for school leaders to make the shift to their roles as an educational leader.

Sensemaking in professional learning is part of the reflective process regardless of the type of collaboration undertaken, but in the context of Benchlearning, there are strong components of the reflective process. Reflection through sensemaking is deepened for educational leaders who work through the Benchlearning process as principals make shifts in practice that require justification of the need to make the change, as well as the method employed to do so (Aas & Paulsen, 2019). This metacognitive reflection on personal practice allows for deepened commitment to transferring new knowledge to practice (Aas & Paulsen, 2019). In another study, principals who had been through a Benchlearning process, saw the process as both a disciplined and systemic practice that supported changes in leadership practices leading to school transformation (Aas, Vennebo, & Halvorsen, 2019). The application of sensemaking and Benchlearning

support the use of a framework borrowed from the corporate sector were supported by the use of a corporate framework for human capital management that was applied to the educational setting.

Sustained professional learning. Highly effective professional learning is sustained over time. This is an area of overlap with other effective practices. For example, the coaching cycle is designed to include multiple experiences and interactions between the coach and the participant in the professional learning experience. The coaching cycle often begins with an initial interview or conversation, observations, feedback and discussion, and is then repeated so that ongoing support is provided (Zepeda, 2018). Professional learning communities foster trust and build relationships with the intent of developing habits of mind for working together over time to tackle issues related to school improvement (Prestridge & Main, 2018).

Challenges and Barriers

It is important to understand potential challenges and barriers to the design and implementation of high-quality professional development. There are several challenges to implementing effective professional development. There are four factors that are predominant obstacles working against system-level implementation of high-quality professional development. Each of the four barriers were identified and described below. It was also noted that improvements were needed to overcome the barriers and increase the effectiveness of professional development. One problem identified was a lack of a shared vision and lack of understanding of the need (Paterson, 2019). In this case, the principal preparation adds to the problem because the traditional training that principals

typically receive does not prepare these principals for organizing needs-based professional learning (Paterson, 2019; Tooley & Connally, 2016). The second barrier is that one-shot workshops are still being implemented because these workshops are easier to organize and schedule (Tooley & Connally, 2016). Further, teacher contracts work against professional development models that are more time intensive, as many contracts provide limited time for professional development and other requirements beyond the contracted day (Morgan & Bates, 2018; Tooley & Connally, 2016). The third barrier was implementation issues regarding the quality and the fidelity of implementation, often due to lack of capacity to support the work (Tooley & Connally, 2016). Finally, there are not currently good methods for evaluating the outcomes of professional learning, making it difficult for leaders to understand what is working, and why it is working (Paterson, 2019; Tooley & Connally, 2016). Even with the barriers and challenges, however, it is important to view professional learning through the lens of student achievement in a globally competitive world.

Overcoming the Barriers

The ESSA plan provides an opportunity to address professional learning in a way that may lead to improvements in our educational system through human capital management and leadership development (Learning Forward, 2017). Because the ESSA plan requires documentation of, “improved teacher, principal, or other school leader effectiveness” (Every Student Succeeds Act, Title II, 2103(a)(1)). This language provides state and district leadership with the opportunity to select and align talent management strategies to meet the requirements through leadership development (Learning Forward,

2017). Further, ESSA requires that states articulate purposeful plans that identify how Title II funds, and other federal funds will be utilized as a means to support professional growth and improved in areas of human capital management (Learning Forward, 2017) so that these initiatives are aligned with the definition of professional learning, according to ESSA.

Professional Learning in the Era of the Every Student Succeeds Act

ESSA redefined the notion of professional learning by establishing a new definition of the concept (Learning Forward, 2017). Many aspects of the redefinition of professional development and professional learning have applications that directly apply to school leadership and school principals. In the context of school leaderships and school principals, according to ESSA (2015), the term professional development means activities that are an

integral part of school and local educational agency strategies for providing educators (including teachers, principals, other school leaders, specialized instructional support personnel, paraprofessionals, and, as applicable, early childhood educators) with the knowledge and skills necessary to enable students to succeed in a well-rounded education and to meet the challenging State academic standards (ESSA, 2015).

Further, ESSA (2015) recognizes that effective professional development activities can no longer be workshops that are stand-alone or short-term and must be sustained over time. To qualify under ESSA (2015) guidelines, professional development experiences must include collaborative strategies that are focused on the classroom and must be

driven by data. Finally, the ESSA (2015) regulation required the “support the recruitment, hiring, and training of effective teachers, including teachers who became certified through state and local alternative routes to certification (Title viii, p. 107),” so that principals will be empowered to hire and develop their teachers. Through these measures identified in ESSA (2015), funding is made available to support leadership development for school principals. The areas and requirements specified the need for increased requirements for professional learning activities, including a specific amount of funding that is set aside for leadership professional development. ESSA also required that there would be focus placed on accountability through evidence-based professional learning.

Professional Learning Standards

To monitor evidence based professional learning, standards that are aligned to the goals of ESSA are needed. It is important that professional development be aligned to a set of standards that are based upon a strategic plan that is also aligned with ESSA (Learning Forward Educational Counsel, 2017) and helps to create a clear vision for the ultimate outcome of the education system, which is to graduation a well-prepared workforce (Phillips et al., 2016). *A New Vision for Professional Learning* (Learning Forward, 2017) provided a synthesis of strategies that will move the education system towards this end (Learning Forward Educational Counsel, 2017). All these recommended strategies and the inclusion of the cycle for continued improvement can be applied to professional learning experiences for principals and were embedded into the design of the professional development experience.

The Need for Professional Development for Principals

School principals are the key leaders assigned to schools, and as such, the school principal sets the vision and the expectations for everyone who works in the school. Yet, even with the identification of the principal as holding the most critical role in the building, the education and training that principals receive may not be adequate to accomplish their work. According to the Wallace Foundation (2011), “Principal leadership is among one of the most urgent matters on the list of issues in public education” (p. 3). Yet, principals are not being adequately prepared for the role that they are about to embark upon through principal preparation programs (Spanneut, Tobin, & Ayers, 2012). In fact, Ballenger, Alford, Mccune and Mccune (2009) stated that “Our conventional procedures for training and certifying school administrators are simply failing to produce a sufficiency of leaders whose vision, energy, and skill can successfully raise the educational standards of children (p. 533).” Principals may need specific training that is directly aligned to the needs of the students in the school where they are serving, even though they may have had training in leadership in their principal preparation program (Kearney & Valadez, 2015). The need for principal professional development is evident based on the findings of a study conducted by Ng and Szeto (2016). Ng and Szeto (2016) studied a group of inservice principals and a group of newly appointed principals, looking at the self-identified understandings of their role and their perceptions of their need for professional development. The findings from the study revealed that most of those principals included in the understood that they would be charged with numerous roles and responsibilities ranging from management and

facilitation to establishing a vision, carrying the vision out by managing resources and planning implementation along with other unspecified roles and responsibilities (Ng & Szeto, 2016). To accomplish such varied and comprehensive roles, professional development was identified to be needed (Ng, 2019). Professional development for school principals may hold a critical key to success and is a way to cultivate effective leadership skills (Brown & Bogiages, 2019).

Knowing that aligned professional learning holds the key to effective performance in the role of principal as measured through student performance, it is important to provide relevant experiences for principals designed to follow the research implications for the continuous improvement cycle. It becomes increasingly important to consider the professional development opportunities for principals (Learning Forward, 2017). DuFour (2004) stated that instructional leaders are not applying professional learning principles that are offered to teachers to meet the professional objectives growth objectives. Yet, even with the knowledge that leadership is critical for fostering collaboration amongst teachers, administrators are not receiving opportunities to engage in professional learning experiences (Schachter, Gerde, & Hatton-Bowers, 2019).

For school systems to improve, leaders must shift their focus from managing school operations to leading instruction and place emphasis on professional learning for leaders (Paterson, 2019). Yet, according to DuFour and DuFour (2013), the school leaders will benefit by receiving the same quality of collaborative professional development that is often made available to teachers. For a leader to be successful at improving teaching and learning through deepening their own knowledge of content,

curriculum, and instruction, there is a strong need for professional development (Gurley, Anast-May, O'Neal, & Dozier, 2016). Currently, many instructional leaders have limited understanding of the content in some subject areas (Cobb, McClain, Lamberg, de Silva Lamberg, & Dean, 2003).

As accountability measures increase, it becomes more apparent that principals must be supported through robust training opportunities to improve their self-efficacy in content, pedagogy, and methods for teaching and learning (Styron & LeMire, 2009). The principal is the single most important factor who can influence and improve teaching and learning, resulting in student achievement (Leithwood et al., 2010). Professional learning standards for teaching and learning must be implemented to assure the greatest growth is achieved in a school (National Policy Board for Educational Administration, 2017). Leaders are in need of high-quality professional development experiences that are implemented in a system-wide framework to aid in the unpacking and prioritizing of the multifaceted role of the principal (Paterson, 2019). The onus is on districts to develop professional learning pathways and programs to enhance capacity for school leaders to build a culture for developing a “coherent vision for the future of their school” (Southern Regional Education Board, 2010, p. ii) so that they can “create their own vision and goals at the school level” (Southern Regional Education Board, 2010, p. ii).

The availability of the new set-aside for leadership development provides a powerful opportunity for new funding sources and additional resources for leadership support for principals and for other leaders at the school level. ESSA stipulates that “...in addition to funds [for state allowable uses]. A state educational agency may reserve not

more than 3 percent of the amount reserved for subgrants to local educational agencies... for one or more of the activities for principals or other school leaders that area described in paragraph (4), [state allowable uses]" (Every Student Succeeds Act, Title II, 2103(a)(1)).

Justification for Professional Development for Principals

There are two groups of individuals to consider when studying the status of principal preparation. The first group is the aspiring leaders working on their credentials to become a principal and are currently in the leadership preparation process, and second group is those principals currently serving in that role are in need of additional professional development or retraining. In a seminal study conducted by Leithwood et al' (2004) there was a major shift from the past predominant role of principal leadership, defined by focusing on the "B's" to a new focus on the role of the principal as instructional leader. The "B's" referred to "bricks, busses, budgets (p. 105)," and managing staff, policy, and procedure so that the operations of the school ran smoothly. During this time of new thinking, school leadership emerged as a component that played a significant contribution to student success, and an area that needed to be studied. The Wallace Foundation, beginning in the early 2000's, was amongst the first to realize that it was important to study the leadership in schools as a vehicle to advance student achievement (Brown & Bogiages, 2019). Further, next to classroom instruction, school leadership was identified as the most critical factor contributing to student success (Brown & Bogiages, 2019; Leithwood et al., 2010). Many studies were published during this time period, laying the groundwork for a project known as the Principal Pipeline

Initiative (Brown & Bogiages, 2019). The Principal Pipeline Initiative was designed based on the findings from the prior body of work to place emphasis on the most significant learnings of that work (Brown & Bogiages, 2019). Those findings from the Wallace Foundation (2011) were consolidated into four overarching areas including of focus, including 1) identification of key leadership duties and requirements; 2) development of preservice program consistency to address key responsibilities; 3) data-driven considerations when hiring school leaders; and 4) mentoring and support for principals, both new and those already on the job. (Brown & Bogiages, 2019). The study took place in urban schools within six large school districts, which were Charlotte-Mecklenburg Schools in North Carolina, Denver Public Schools in Colorado, Gwinnet County Public Schools in Georgia, Hillsboro County Public Schools in Florida, New York City Department of Education in New York, and Prince George County Public Schools in Maryland (Gates, Baird, Master, & Chavez-Herrerias, 2019). The research held promise in the area of principal development as a strategy for student achievement in four key areas (Gates, et al., 2019). First, the work proved that it is possible for rapid systems change to occur in a fairly short period of time when there are structures in place to facilitate such a change (Gates, et al., 2019). Each of the districts under study implemented all components of the program at a cost of only \$42.00 per full-time enrollment, which is relatively low compared to other initiatives (Gates, et al., 2019). Second, principal retention in the treatment districts was higher than principal retention in the non-treatment districts (Gates, et al., 2019). Principals in a treatment school had retention rates that were 5.8 and 7.8 percentage points higher than principals in a non-

treatment school in years 2 and 3 of the study, respectively (Gates, et al., 2019). Across the six districts under study, student achievement in both math and reading were higher than in the nontreatment districts (Gates, et al., 2019). The evidence suggested that investment in principal development, both in the preservice and in-service career phases yielded positive outcomes, especially in elementary and middle schools, and justified the investment in principal preparation (Gates, et al., 2019). This claim is further supported by the work of Cooper et al. (2016) which revealed the changing role of the work of the school principal and the need for a different kind of support (Cooper et al., 2016).

Some of the key activities leading to the positive outcomes in student achievement included the development of data systems to track and monitor key areas of principal background, prior experience, principal performance as measured by student data, and the assessment of principal competencies as measured through a rubric (Gates, et al., 2019). Cooper et al. (2016) found that principals plan an important role in the content area, especially mathematics, by creating a culture of learning that is supportive of collaboration.

Principal as Learner

Because principals, charged with the responsibility of improving student achievement at their school, are expected to produce results (Sanzo, 2016). Spanneut et al. (2012) learned that “principals are interested in receiving professional development training to improve their leadership skills and abilities” (p. 11). Research which had taken place prior to this shift in thinking acknowledged that schools are not organized to effectively support and encouraging learning that is designed around growth of the team

instead of the individual (Paterson, 2019). This lack of effective organization has been applied to specific content area learning, as well. According to Cooper et al. (2016) the principal plays an important role in supporting instruction in mathematics. But principals need additional support to be successful in leading and coaching in content areas, and each content area, especially mathematics, has specific demands and requirements, and that research, leadership, and teaching are integrally linked (Martinovic, Horn-Olivito, & el Kord (2017). With these findings in mind, it is important to develop principals as instructional leaders, both in principles of leadership and in content specific leadership (Martinovic et al., 2017).

Principal as Instructional Leader

Many principals received their initial training under the prior framework with guidelines supporting the earlier definition of the role of school principal as the manager of the building with the focus on operations (Leithwood et al., 2004), but for a shift towards the role of instructional leader in various content areas to take place, training and support are needed (Cooper et al., 2016). For this shift to take place educational leaders, such as principals, must be willing to adapt their mindset to that of lead learner (Martinovic et al., 2017). The formative leadership theory (Ash & Persall, 2000) sets a foundation for the type of change that was required to shift practice in leadership and serves as a foundation for the Wallace work to build upon (Ash & Persall, 2000). The seminal underpinnings from Ash and Persall (2000) served as another point to build upon for justification for the need to address both preservice and inservice development of principals.

On-Going, Job-Embedded Professional Development for Principals In-Service

According to Fullan (2018), learning experiences remain tense in many places as students continued to report boredom, teacher satisfaction continues to decline by 24% since 2008, and 75% of principals have reported that their job has become overly complicated, and that they feel that they are under high stress every day of the week, including weekends (Fullan, 2018). In addition to this, the work satisfaction levels were reported to have dropped by 9 percentage points to only 59% of principals reporting job satisfaction from 2008 (Fullan, 2018). Fullan (2018) refined the definition of principal as instructional leader, to principal as “direct instructional leader” (p. 6) to align with the work of the overarching development that is needed to empower principals to aspire to their top priority as a change agent, empowered to make a strong and lasting difference in the outcomes at their schools (Fullan, 2018). Learning from the business sector, Phillips et al. (2016) followed a similar scope of work in defining the needs of the school principals as the chief learning officer at their schools. This is an important connection to make because the work of Phillips et al. (2016) led to a deepened understanding of the costs of failing to prepare students for the workforce of the future, and the implications of the persistence in a skills gap in the product of the work of the principals and our educational system. The findings from Phillips et al. (2017) can be transferred and applied in the principal professional learning process and form the outline for the project study presented (Phillips et al., 2016).

Project Description

The project that I developed is a professional learning experience that will take place over 3 days and would be appropriate to implement at any time of year. Ideally, because the training will provide strategies for support in the process of hiring and placing teachers, the training should occur in the winter, prior to the time when hiring and placement decisions are made for the upcoming school year. This workshop has been designed as an active, interactive experience that will be immediately applicable in the work setting.

Purpose, Goals, Learning Outcomes and Audience

Project Purpose

The purpose of this professional learning experience is to provide elementary school administrators with the strategies that have been designed to lead to improved quality of instruction in elementary mathematics. The professional learning experience was developed around the framework for strategic management of human capital in public education (Odden & Kelly, 2008).

Project Goal

The goal of this project is for elementary school principals to be able to apply the principles of the framework in the context of instructional quality in mathematics and will collaborate to develop a protocol for use when hiring and assigning teachers to teach mathematics. By the end of the 3 days of professional development, the group of elementary school principals will have developed a protocol to use when hiring and placing teachers to deliver instruction in mathematics.

Intended Learning Outcomes

The intended learning outcomes for the 3-day professional development experiences are as follows. The participants will:

- Become familiar with the framework for human capital management developed by Odden and Kelly (2008);
- understand how the framework aligns with current human capital management practices in the district;
- understand potential challenges to implement aspects of the framework into hiring and teacher placement practices;
- understand the connection between elementary teacher content knowledge and instructional quality in mathematics;
- gauge their own understanding of mathematical concepts;
- identify challenges in mathematics instruction at their individual schools and develop strategies to improve instructional quality;
- develop a list of characteristics and qualities of a strong elementary school mathematics teacher;
- create a pilot draft interview protocol for use when hiring and assigning mathematics teachers; and
- leave with an implementation and support plan, as well as the details for the professional learning community supports during the implementation of the project.

Project Audience

The target audience for the professional learning experience will be elementary school principals. In addition, this professional learning experience will be appropriate for any other school-based administrators who are responsible for hiring and assigning teachers to provide instruction in mathematics. Further, district staff in the areas of principal supervision and human resource management will benefit by attending this professional learning experience.

Project Implementation and Timeline

To prepare to implement this professional development, an implementation timeline was created. Table 10 below presents the timeline for planning and implementation of the professional learning experience.

Table 10

Professional Development Planning and Implementation Timeline

Task number	Task description	Duration in days	Start date	End date
1	Review district calendar for conflicts	1	15-Apr-20	15-Apr-20
2	Set training date	1	15-Apr-20	15-Apr-20
3	Reserve training room	1	15-Apr-20	15-Apr-20
4	Develop invitation list	1	15-Apr-20	15-Apr-20
5	Send out save the date e-mail	2	15-Apr-20	16-Apr-20
6	Determine training budget	6	17-Apr-20	23-Apr-20
7	Plan topics for training	10	16-Apr-20	26-Apr-20
8	Send out official invitation and agenda	1	27-Apr-20	28-Apr-20
9	Order food	1	29-Apr-20	30-Apr-20
11	Develop program materials	5	01-May-20	06-May-20
12	Finalize agenda	1	07-May-20	08-May-20
13	Develop pre-/post assessment	3	09-May-20	12-May-20
14	Develop exit slip and feedback form	1	13-May-20	14-May-20
15	Send program materials for copying	4	15-May-20	19-May-20
16	Order food	1	20-May-20	21-May-20
17	Order supplies	2	22-May-20	24-May-20
18	Plan seating chart	1	25-May-20	26-May-20
19	Confirm availability of technology	2	27-May-20	29-May-20
20	Confirm catering	1	30-May-20	31-May-20
21	Create name tags, sign-in sheets,	2	01-Jun-20	03-Jun-20
22	Gather supplies and presentation items	2	04-Jun-20	06-Jun-20
23	Transport materials to training site	1	07-Jun-20	08-Jun-20
24	Set up room for training	1	09-Jun-20	09-Jun-20
25	Set up sign-in table	1	11-Jun-20	12-Jun-20
26	Arrive early at training site	1	13-Jun-20	14-Jun-20
27	Sound check technology	1	15-Jun-20	16-Jun-20
28	Conduct training	1	17-Jun-20	18-Jun-20
29	Distribute follow up survey via e-mail	1	19-Jun-20	20-Jun-20
30	Analyze survey results	2	21-Jun-20	23-Jun-20
31	Distribute assessment survey results	1	24-Jun-20	25-Jun-20
31	Distribute thank you notes	1	26-Jun-20	27-Jun-20

Materials Required

Each participant will be instructed to bring a laptop or other device with internet connectivity. Materials and supplies will be needed to implement that professional development program. The materials list includes the following:

- name tags preprinted for each participant,
- printed copies of articles needed for jigsaw activities,
- printed copies of the framework for each table,
- printed exit slips for each day of the training,
- printed copies of the mathematics assessment,
- preprinted charts with statements regarding mathematics instruction,
- a laptop computer to present the PowerPoint slide deck,
- a projector and screen to display the slide deck,
- wall sized sticky pads for each group,
- individual in various colors and sizes,
- pens and pencils,
- markers.

Each day, the room will be set up with round tables seating eight participants per table, with supplies in the center of each table. Name tags will be placed at each table for the participants. Trainer materials include access to a computer with projection capabilities, along with a slide deck to guide the sessions. The complete slide deck is included in Appendix A.

Project Evaluation Plan

The professional development will be evaluated by collecting data each day through the use of a daily exit slip. At the end of each day, I will distribute the exit slips to the participants to receive timely feedback on the day. This will allow any unanswered question to be addressed in a timely manner at the start of the next day. The exit slips will also allow the professional development to be responsive and personalized to the needs of the participants. Each day, the exit slips will be different and specific to the content of the day. The participants will be asked to state any open questions that have not been answered by the end of the day so that those open questions can be addressed the next day. There will also be an open-ended question that asks for general feedback on the daily exit slips. By offering the opportunity for participants to bring up any open question, the learning experience can be even more responsive to the needs of the participants that may have been unapparent to the organizers of the professional development.

A comprehensive survey, included in Appendix A, will be conducted at the end of the 3-day professional development to receive feedback on the overall experience the participants had with the professional development. This survey will be presented to the participants online. Each participant will receive an email with a link to the on-line survey. The survey will be structured to collect feedback for each of the major sessions. Participants will be asked to rate the relevance of each of the sessions. A four-point Likert like scale will be used. There will also be open ended short response questions. The open responses will collect participant data about what the participants found most

effective, as well as what improvements could be made to better address participant needs.

Project Implications

There are implications for positive social change to occur in the bounded case under study as a result of this project. If elementary school principals are empowered to improve instructional quality in mathematics in their schools, then stronger instruction in mathematics may begin to close the achievement gap, thus prepare at-risk students to be better prepared with more career options. This is because a strong background in mathematics is important in numerous areas, including access to higher education and career choices. A stronger talent pipeline, especially in the STEM and computer science fields, could result in economic growth for the region. The project has the potential to create social change affecting several stakeholder groups, including elementary school principals, teachers, students, and the community at large, due to the potential economic growth. These implications are described below'

Elementary school principals have been identified as the instruction leaders in their schools. To accomplish the task of leading instruction, a framework for human capital management including an interview protocol, coupled with adequate content knowledge in mathematics, could empower elementary school principals to lead their school with greater self-efficacy when making decisions regarding hiring and assigning teachers to provide instruction in mathematics' In addition to making better decisions when hiring and assigning teachers, this increased knowledge will allow elementary school principals to be stronger leaders as they serve in the role of instructional leader. As

this new learning is applied in the schools, elementary school principals could have the ability to provide better feedback to teachers, and to better identify appropriate learning experiences for teachers to grow in their own mathematical content knowledge'

With the strengthening of the elementary school principal, teachers could experience positive social changes through improved self-efficacy. Stronger and deeper content knowledge could allow more teachers to be rated as highly effective. Teachers could potentially receive incentive pay, which would close some of the gaps in the pay differential, and possibly draw more teachers to the field.

The most important area of possible social change would be higher quality instruction in mathematics leading to higher student achievement, especially for students who are at risk due to socioeconomic conditions. When students are proficient in mathematics, access to more opportunities and options for college and career are open. Many of the most high-demand, high-wage careers require a strong foundation in mathematics.

Strengthening schools, through the empowerment of elementary school principals, mathematics teachers, and students could potentially have a positive effect on the bounded case under study from an economic development standpoint. If underserved students are better prepared to enter the workforce and chose a high-wage, high-demand career in the local area, economic conditions might improve. This improvement could potentially have a positive effect on the lives of students and the communities in which they live by elevating the economic status of individuals and the community at large.

Section 4: Reflections and Conclusions

Project Strengths and Limitations

Strengths

The strength of this project is the deliberate and direct alignment to strategies that had been defined as effective through a review of the literature. The 3-day professional development workshop was created to increase efficacy in the process used by school principals when hiring and assigning teachers to provide instruction in mathematics. The 3-day professional development workshop shared in Section 3 provides an actionable pathway for school principals to understand the deficits that exist in the preparedness of some teachers and of some teacher candidates in the content area of mathematics, and provides school principals with the opportunity to collaboratively develop a set of interview protocols that could be used across the region to increase the consistency of the interview project.

Another strength of the project is the ability for it to be immediately applied in the workplace to address a gap in practice with the potential to have a positive effect on the condition of instruction in mathematics in the elementary setting. The professional development project started the opportunity for an ongoing community of practice in the area of mathematics instruction, building the basis for school principals to continue to work on school improvement and instructional quality in the mathematics classes in their own school. I developed this project based upon a gap in practice that was identified after the analysis of the data that were presented in Section 2, with consideration given to the

qualitative and quantitative data that were presented in Section 1, where the nature of the local problem was established.

Limitations

There were limitations to this study, including the sample size, geographic confines of the bounded case, and effect of potential researcher bias. I interviewed 10 school principals for this study, representing areas that were rural and urban, as well as bedroom communities for the urban area of the bounded case. Although the participants in the study were from the various types of communities in the region, they represented a small sample of these types of communities around the state and the nation. There is a persistent problem with mathematics across the United States, and the participants included in this study represent a very small sample compared to the number of principals nationwide.

The bounded case under study was also representative of just a small part of the larger region as a subset of the state. It is possible that the inclusion of a broader geographic area would have yielded data that may have brought out additional data that either supported or changed the findings from the data collected in this study. In addition, the rural community included in the sample is relatively close to suburban and urban areas, giving the members of the community easier access to resources than might be the case in other rural communities across the state or the country. Similarly, the urban area included in the study represents a small city that is not considered to be a major city compared to larger metropolitan hubs in the United States. Therefore, the challenges

present in a larger city might not have been present in the schools where the participants in this study worked.

Finally, I have over a decade of experience in educational leadership with a focus on content knowledge in mathematics, and it is my experience that caused me to develop a passion and interest in the topic of mathematics education at all levels. Due to my extensive experience, there was a chance that some of my personal biases could have been present in my analysis of the data. Although the study was designed to minimize researcher bias, there is a chance that some of my personal experiences could have influenced my interpretation of the data.

Recommendations for Alternative Approaches

One alternate approach to this study could have been to use a comparative case study model. To conduct such a study, I could have looked for another region or state where student achievement in mathematics was higher. I could have used the same interview protocol and looked for similarities and differences in the hiring and staffing practices between the two settings. This study allowed me to collect evidence to determine if hiring and staffing practices may be contributing to the problem with student achievement in mathematics. By taking a different approach, I might have been able to see if there are any indicators that emerged that hiring and staffing practices may be contributing student success. This could have provided an opportunity to compare and contrast data from two areas with different levels of student achievement in mathematics.

Another alternate approach to this study could have been to take a mixed methods approach to the study by including quantitative data. In this approach, the interviews with

the stakeholders would have been conducted using the same interview protocol, but in addition to the interview data, publicly available student achievement data from the state assessment system could have been reviewed to look for any correlation between the math background of the school principal and student achievement in mathematics. A possible hypothesis would be that student achievement in mathematics would be higher in a school where the leader of that school has a higher level of mathematics background and content knowledge.

There was also a possible alternative to the project that I selected to prepare based on the data from this study. Instead of placing focus on the elementary school administrators working in the schools, I could have turned my attention to policy. There are two policy changes that were implied based on this study. As such, a policy paper could have been developed to address one or both of the gaps in practice in the bounded case' The first possible policy paper could address recommended changes to school administrator preparation and implications for the certification exam' A second possible policy paper could suggest the establishment of a certificate in mathematics for elementary teachers' This certificate could serve as an indicator to elementary school principals as they were considering the hiring and assignment of teachers to provide instruction in mathematics. Both of these potential policy papers could present information to Florida legislators that could potentially affect student achievement in mathematics, leading to a more well-educated future workforce and social elevation for at-risk youths.

Scholarship, Project Development, and Leadership and Change

Scholarship

As a scholar, I experienced growth in my understanding of how to use data to conduct research and drive system change. Sound policy should be based on data, and I learned that what may appear to be a simple problem, especially in areas of human research, are multifaceted with many potential solutions. I also learned that the process of research is based upon understanding the conditions that lead to the existence of a problem in education. When identifying a local problem, it is important to know that conditions vary across instructional settings, and that these variations may prevent educational researchers from generalizing to a wider population. I also learned that the approach to education varies from state to state and even from region to region within a state. Although there may be apparent similarities in output, as validated by student achievement, the underlying causes may be reflective of a wide range of differences. These differences may be caused by the differences in state policies for teacher certification, preparation programs, and district structures and protocols.

Some of the most significant education I experienced occurred when I learned to define the problem and then align the research questions with the phenomena that I wanted to understand. As I learned to align all phases of developing a study, I realized that it was extremely important to uncover the conditions that exist in the system to understand both symptoms of the underlying problem, which was student achievement in the case of this study, and the effect that my own researcher bias and experience in the field brought to the study in both a positive and negative way. My experience helped me

understanding the problem with depth and clarity, but my experience also could have closed my mind to possible questions that may have been in conflict with my personally held beliefs and preconceptions.

Through this scholarly work, I was challenged to seek different answers, to review the work of authors I was not familiar with, and to consider alternate explanations for why conditions prevail for some of the most challenging situations in various educational settings. This process opened me to new ideas and allowed me to look at ways to potentially solve problems that were very different than what I might have considered prior to the collection of data. This process expanded my understanding of data-driven decision making, as I learned that there are many types of data that must be considered before immediately defining a solution and that multiple perspectives and factors could be effecting the decisions that others have made that have potentially lead to the existence of the problem.

Project Development

The process of developing as a researcher helped me to grow professionally as a scholar, practitioner, and project developer. Once I identified the problem and the gap in local practice that became the topic of this study and project, I realized that, through scholarship, there was so much to learn that I did not know about. I learned that, although some studies seem complex and others seemed relatively simple, each of the studies that I read contributed to my understanding of the problems in education. This work, especially in reviewing literature, helped me learn that research on practices that might instinctively seem apparent as a good solution may indicate something different. Reviewing numerous

articles and studies also revealed complexities in educational theory coupled with backgrounds and experiences of different individuals in various educational settings that uncovered startling and unexpected findings. Even in my own data collection, there were times when I was astonished by what I heard in the interviews. When I heard certain statements once, I thought those to be outliers, but when I saw patterns begin to emerge, I realized that I had a lot to learn about the educational conditions in the region where I work, and that I needed to adjust my own thinking based on the new knowledge I gained as I plan for my future work as a researcher and practitioner.

Leadership and Change

This experience has expanded my perspective as a practitioner and helped me to realize that the problems I am trying to solve have many more potential root causes than what I had anticipated prior to participating in research. This experience will forever influence the way I look at a problem and develop potential solutions. I have learned that it is important to pause and understand what others have tried and what others perceive as the conditions that need improvement. I also realized that when multiple studies show similar findings in disparate communities, there is a chance that those findings and implications for practice may transfer to a new setting. Through pursuit of a doctoral degree, I have had a change in approach to the work I do on a daily basis. This process has helped me develop a mindset with research at the heart of my practice, so that during the planning stages of a new and innovative program, I will need to consider the work through the lens of the research base and how my work could have a greater positive

result on student learning by taking the time to build research questions around the project and contribute to the literature based on local problems in my setting.

This change in mindset helped me in my everyday work as well as in the development of my project. I developed a deeper understanding of best practices in adult learning and a respect for practices that I might have dismissed in the past, because I did not really understand those practices or understand what the literature shares about the effectiveness of practices that have successfully contributed to learning gains for students by working through the adults who are responsible for shepherding the growth of student learning in schools. I learned that it is important to keep proven effective strategies in the forefront of program design, not just for my project, but in my everyday practice as a professional. I have already seen personal growth in my work as a result of my pursuit of scholarship through earning a doctoral degree.

Reflection on the Importance of the Work

Through this work, I came to understand the depth of reflective practice, and deepened my own understanding of what it means to be a reflective scholar and practitioner. At the start of this study, I thought that the content knowledge of teachers in mathematics was at the heart of the student achievement problem in my local setting. Through this process, I learned that student achievement in mathematics is a complex problem with multiple factors contributing to the problem. One factor that may have contributed to the problem was the lack of content expertise that school principals possessed and how this lack on content expertise may have impacted the decisions that were being made when hiring and staffing mathematics classrooms. Understanding the

potential to provide school principals with a better set of protocols and tools for making informed hiring and placement decisions could lead to higher quality mathematics instruction for all students. Students with higher competencies in mathematics have more options for college and career choices, especially for high-wage, high-demand careers in the STEM and computer science fields. This work is very important because the education system holds the key to the economic development in the local educational setting, and that school leadership holds a large stake in setting students on the pathway towards a prosperous future.

Further, I learned that leadership in education is evolving and changing as accountability increases in schools at all levels. In elementary schools, there are multiple pressure points facing principals in the areas of hiring and assigning teachers, especially in content areas that require deeper background and knowledge, such as mathematics. School principals are responsible for setting the vision of a school and establishing the means by which students will learn based as executed at the hands of the teacher that is assigned to each classroom. Pressures that must be considered by school leaders include the content knowledge of the teacher, the ability to manage the learning environment, and ability to nurture the whole child attending to the social and emotional needs of each student in the classroom. This work is critically important because working together as a system to address the needs of each student while assuring that the teachers we place in each mathematics classroom are properly equipped to prepare students for the changing and requirements for a prosperous future.

Implications, Applications, and Directions for Future Research

Implications for Positive Social Change

Proficiency in mathematics holds the key to many of the high paying jobs that are currently available. Data also had shown that the growth in jobs that rely on strong mathematical background and content knowledge will continue to grow. Yet currently, the students who are in the subgroups that are most underrepresented in the workforce are also at risk due to lower rates of proficiency in mathematics. In many cases, the teachers who are the strongest in mathematics are not providing instruction to the students most at risk. To open doors to the some of the highest paying jobs, students need access to high quality instruction in mathematics.

Applications

The application of the professional development is intended for elementary school principals and any school leader who is involved in the hiring and assignment of teachers, especially teachers who will be assigned to provide instruction in mathematics. The professional development that I created for school-based administrators could grow mathematical content knowledge in people who are charged with hiring for and staffing mathematics classrooms. The development of a new framework for interviewing potential mathematics teachers, as well as a new tool for structuring the interview could lead to more consistency during interviews, which may lead to improvement in the quality of instruction in mathematics for children.

Directions for Future Research

Building upon the hypothesis presented in the alternate approach described above, a possible direction for future research would be to address the connection between the specific depth of content knowledge in mathematics and the teaching background of the school principal compared with student achievement in mathematics. Research questions that could be explored would include:

- Do school leaders with a deeper content knowledge in mathematics hire and assign teacher with deeper content knowledge in mathematics to provide instruction in mathematics in their schools?
- Is there a correlation between school principal content knowledge and educational background in mathematics with student achievement?
- Is there a correlation between school principal teaching experience in mathematics with student achievement?
- Is there a correlation between school principal teaching experience in mathematics and instructional quality in mathematics?

Conclusion

After the identification of a local problem with student achievement, especially for those from at risk and underserved populations, I designed a study to understand one possible root cause of the problem of student underachievement in mathematics. After conducting data analysis from interviews with school principals in the bounded case under study, I was able to identify a gap in local practice in the area of hiring mathematics teachers and placing teachers in assignments to teach mathematics. The gap

in practice that I identified was a lack of consistency in interview and hiring practices across the region.

After identifying the local problem and gap in practice, I designed a professional development for principals and other elementary school leaders to address the local problem and the gap in practice. The professional learning experience will provide an opportunity for elementary school principals to develop a new tool for interviewing teacher candidates for positions in mathematics based on a framework for human capital management adapted from the business sector with implications for education. By working collaboratively and as a learning community, the elementary principals will bring consistency across the region with regard to hiring and assigning teachers in the content area of mathematics, and will have the potential to improve student achievement in mathematics, especially for those most at risk, leading to positive outcomes for students and deepened community and professional learning for educational leaders across the region.

It is of great importance that educational experiences are provided to all students that ready them for success in the workforce of the future. Mathematics provides the underpinning skills that are required for a workforce where almost every sector is wrapped in technology and driven by computer science. With mathematics as a critical skill for success in the careers of the future it is important for those students most at risk to be given every opportunity for success, especially in the classroom. This study may empower school principals to make positive advances in hiring and assigning teachers for mathematics teaching assignments, especially in those schools where challenges exist.

This work may help advance instructional quality and assure that more students receive high quality instruction in mathematics. High quality instruction in mathematics will lead to stronger learning gains for students.

References

- Aas, M., & Blom, T. (2018). Benchlearning as professional development of school leaders in Norway and Sweden. *Professional Development in Education, 44*(1), 62-75. doi:10.1080/19415257.2017.1355840
- Aas, M., & Paulsen, J. (2019), National strategy for supporting school principal's instructional leadership, *Journal of Educational Administration, 57*(5), 540-553. doi:10.1108/JEA-09-2018-0168
- Aas, M., Vennebo, K., & Halvorsen, K. A. (2019). Benchlearning—an action research program for transforming leadership and school practices. *Educational Action Research, 27*(5), 1-17, doi:10.1080/09650792.2019.1566084
- Abu-Tineh, A. M., & Sadiq, H. M. (2018). Characteristics and models of effective professional development: The case of schoolteachers in Qatar. *Professional Development in Education, 44*(2), 311-322. doi:10.1080/19415257.2017.1306788
- Anderson, E., & Reynolds, A. (2015). The state of state policies for principal preparation program approval and candidate licensure. *Journal of Research on Leadership Education, (10)*3, 222-225, doi:1942775115614292
- Andrews, D. J. C., & Richmond, G. (2019). Professional development for equity: What constitutes powerful professional learning? *Journal of Teacher Education, 70*(5), 408-409. Retrieved from https://www.researchgate.net/profile/Gail_Richmond/publication/336330984_Professional_Development_for_Equity_What_Constitutes_Powerful_Professional_L

earning/links/5d9f6b72299bf116fe9c78fd/Professional-Development-for-Equity-What-Constitutes-Powerful-Professional-Learning.pdf

Ash, R., & Persall, J. (2000). The principal as chief learning officer: Developing teacher leaders. *NASSP bulletin*, 84(616), 15-22. doi:10.1177/019263650008461604

Ball, D. L., Thames, M. H., & Phelps, G. (2008). Content knowledge for teaching: What makes it special? *Journal of Teacher Education*, 59(5), 389-407.
doi:10.1177/0022487108324554

Ballenger, J., Alford, B., Mccune, S., & Mccune, D. (2009). Obtaining validation from graduates on a restructured principal preparation program. *Journal of School Leadership*, 19(5), 533-558. doi:10.1177/105268460901900502

Bastian, K., & Fortner, C. (2018, March). *Is less more? Outcomes for subject-area specialists in elementary grades*. Paper presented at the Association for Education Finance and Policy 43rd Annual Conference, Portland, OR. doi:
10.1162/edfp_a_00278

Bastian, K., & Henry, G. (2015). The apprentice: Pathways to the principalship and student achievement. *Educational Administration Quarterly*, 51, 600-639.
doi:10.1177/0013161x14562213

Becker, B., Huselid, M., & Ulrich, D. (2001). *The HR scorecard: Linking people, strategy, and performance*. Cambridge, MA: Harvard Business School Press.
Retrieved from
[https://books.google.com/books?hl=en&lr=&id=6VWKbcBwsbUC&oi=fnd&pg=PR9&dq=Becker,+B.,+Huselid,+M.,+%26+Ulrich,+D.+\(2001\).+The+HR](https://books.google.com/books?hl=en&lr=&id=6VWKbcBwsbUC&oi=fnd&pg=PR9&dq=Becker,+B.,+Huselid,+M.,+%26+Ulrich,+D.+(2001).+The+HR)

+scorecard:+Linking+people,+strategy,+and+performance.+Cambridge,+MA:
 +Harvard+Business+School+Press.&ots=uvijF0kdI3&sig=wMcJloKd3RNNZ
 mbpC8vjyGPoWZ8#v=onepage&q&f=false

- Bengt, K., Lundgren, K., & Edenfeldt-Froment, M. (2001). *Benchlearning: Good examples as a lever for development*. New York, NY: Wiley. Doi: 10.5555/559769
- Blank, R. (2013). Science instruction time is declining in elementary schools: What are the implications for student achievement and closing the gap? *Science Education*, 97, 830-847. doi:10.1002/sce.21078
- Blazar, D. (2015). Effective teaching in elementary mathematics: Identifying classroom practices that support student achievement. *Economics of Education Review*, 48, 16-29. doi:10.1016/j.econedurev.2015.05.005
- Bøje, J. D., & Frederiksen, L. F. (2019). Leaders of the profession and professional leaders. School leaders making sense of themselves and their jobs. *International Journal of Leadership in Education*, 22(1), 1-22. doi:10.1080/13603124.2019.1591515
- Botha, H., Maree, J., & Stols, G. (2013). Mathematical literacy teachers: Can anyone be one? *Perspectives in Education*, 31(4), 180-194. Retrieved from https://repository.up.ac.za/bitstream/handle/2263/40030/Botha_Mathematical_2013.pdf?sequence=1&isAllowed=y
- Brown, R., & Bogiages, C. (2019). Professional development through STEM integration: How early career math and science teachers respond to experiencing integrated

STEM tasks. *International Journal of Science and Mathematics Education*, 17(1), 111-128. doi:10.1007/s10763-017-9863-x

Buchanan, R., & McPherson, A. (2019). Teachers and learners in a time of big data.

Journal of Philosophy in Schools, 6(1), 26-43. doi:10.21913/jps.v6i1.1566

Cannata, M., & Engel, M. (2012). Does charter status determine preferences? Comparing the hiring preferences of charter and traditional public school principals.

Education Finance and Policy, 7(4), 455-488. doi:10.1162/edfp_a_00076

Cannata, M., Rubin, M., Goldring, E., Grissom, J. A., Neumerski, C. M., Drake, T. A., &

Schuermann, P. (2017). Using teacher effectiveness data for information-rich

hiring. *Educational Administration Quarterly*, 53(2), 180-222.

doi:10.1177/0013161x16681629

Carney, M., Brendefur, J., Thiede, K., Hughes, G., & Sutton, J. (2016). Statewide

mathematics professional development: Teacher knowledge, self-efficacy, and

beliefs. *Educational Policy*, 30(4), 539-572. doi:10.1177/0895904814550075

Charalambous, C., & Praetorius, A. (2018). Studying mathematics instruction through

different lenses: setting the ground for understanding instructional quality more

comprehensively. *ZDM Mathematics Education*, 50(3), 355-366.

doi:10.1007/s11858-018-0914-8

Chatterjee, J. (2017). Strategy, human capital investments, business-domain capabilities,

and performance: a study in the global software services industry. *Strategic*

Management Journal, 38(3), 588-608. doi:10.1002/smj.2505

- Choy, W. K., & Chua, P. M. (2019). Professional development. In B. Wong, S. Hairon, & P. Ng (Eds.), *School leadership and educational change in Singapore* (pp. 69-86). Cham, Switzerland: Springer Nature. doi:10.1007/978-3-319-74746-0_5
- Clarke, B., Doabler, C., Nelson, N., & Shanley, C. (2015). Effective instructional strategies for kindergarten and first-grade students at risk in mathematics. *Intervention in School and Clinic, 50*(5), 257-265. doi:10.1177/1053451214560888
- Cobb, P., McClain, K., de Silva Lamberg, T., & Dean, C. (2003). Situating teachers' instructional practices in the institutional setting of the school and district. *Educational Researcher, 32*(6), 13-24. doi:10.3102/0013189X032006013
- Coffey, D., Cox, S., Hillman, S., & Chan, T. (2015). Innovative planning to meet the future challenges of elementary education. *Educational Planning, 22*(1), 5-14.
- Confucius (1979). *The analects* (Lau, C.). London: Penguin Classics
- Cooper, K. S., Stanulis, R. N., Brondyk, S. K., Hamilton, E. R., Macaluso, M., & Meier, J. A. (2016). The teacher leadership process: Attempting change within embedded systems. *Journal of Educational Change, 17*(1), 85-113. doi: 10.1007/s10833-015-9262-4
- Council of Economic Development. (2018). *Economic development*. Retrieved from <http://www.nefrpc.org/Economic%20Development.htm>
- Creswell, J. (2012). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: Sage Publications.

- Darling-Hammond, L., Hyler, M., & Gardner, M. (2017). *Effective teacher professional development*. Palo Alto, CA: Learning Policy Institute. Retrieved from <https://learningpolicyinstitute.org/product/teacher-prof-dev>.
- Dhuey, E., & Smith, J. (2014). How important are school principals in the production of student achievement? *Canadian Journal of Economics*, 47, 634-663. doi: 0.1111/caje.12086
- DuFour, R. (2004). What is a "professional learning community?" *Educational Leadership*, 61(8), 6-11. Retrieved from <http://www.siprep.org/uploaded/ProfessionalDevelopment/Readings/PLC.pdf>
- DuFour, R., & DuFour, R. (2013). *Learning by doing: A handbook for professional learning communities at work TM*. Bloomington, IN: Solution Tree Press.
- DuFour, R., & DuFour, R., Eaker, R., & Many, T. (2006). *Learning by doing*. Bloomington IN: Solution Tree Press.
- Educational Commission of the States. (2018). *Vital signs*. Retrieved from <http://vitalsigns.ecs.org/state/united-states/teachers>.
- Eichhorn, M., & Lacson, C. (2019). Departmentalization for mathematics: Is it beneficial for teachers, students, and teacher candidates? *Journal of Educational Research and Practice*, 9(1), 124-131. doi:10.5590/JERAP.2019.09.1.09
- Eisner, E. (2017). *The enlightened eye: Qualitative inquiry and the enhancement of educational practice*. New York, NY: Teachers College Press.

- Engel, M. (2013). Problematic preferences? A mixed method examination of principals' preferences for teacher characteristics in Chicago. *Educational Administration Quarterly*, 49(1), 52-91. doi:10.1177/0013161x12451025
- Engel, M., & Cannata, M. (2015). Localism and teacher labor markets: How geography and decision making may contribute to inequality. *Peabody Journal of Education*, 90(1), 84-92. doi: /10.1080/0161956X.2015.988533
- Engel, M., Cannata, M., & Curran, F. (2018). Principal influence in teacher hiring: Documenting decentralization over time. *Journal of Educational Administration*, 56(3), 277-296. doi: 10.1108/JEA-05-2017-0061
- Engel, M., & Curran, F. (2016). Toward understanding principals' hiring practices. *Journal of Educational Administration*, 54(2), 173-190. doi:10.1108/jea-04-2014-0049
- Engel, M., & Finch, M. (2015). Staffing the classroom: How urban principals find teachers and make hiring decisions. *Leadership and Policy in Schools*, 14(1), 12-41. doi:10.1080/15700763.2014.983131
- Epstein, D., & Miller, R. T. (2011). Slow off the mark: Elementary school teachers and the crisis in science, technology, engineering, and math education. *Center for American Progress*. Retrieved from <https://files.eric.ed.gov/fulltext/ED536070.pdf>
- Every Student Succeeds Act of 2015, Pub. L. No. 114-95 § 114 Stat. 1177 (2015–2016)
- Fennell, F. (2018). Preparing elementary school teachers of mathematics: A continuing challenge. In G. Stylianides & K. Hino, (Eds.), *Research advances in the*

mathematical education of pre-service elementary teachers: An international perspective (pp. 83-95). doi:10.1007/978-3-319-68342-3

Florida Department of Education. (2016). *FSA Algebra I EOC*. Retrieved from <http://www.fldoe.org/accountability/assessments/k-12-student-assessment/results/2016.shtml>

Florida Department of Education. (2017). *FSA Algebra I EOC*. Retrieved from <http://www.fldoe.org/accountability/assessments/k-12-student-assessment/results/2017.shtml>

Florida Department of Education. (2019). *Educator certification*. Retrieved from <http://fldoe.org/teaching/certification>

Fryer, R., Jr. (2018). The "pupil" factory: Specialization and the production of human capital in schools. *American Economic Review*, 108(3), 616-656. doi: 10.1257/aer.20161495

Fullan, M. (2018). *The principal: Three keys to maximizing impact*. San Francisco, CA: John Wiley & Sons.

Fuller, E., & Hollingworth, L. (2014). A bridge too far? Challenges in evaluating principal effectiveness. *Educational Administration Quarterly: The Journal of Leadership for Effective and Equitable Organizations*, 50, 466-499.

Gallagher, H., Arshan, N., & Woodworth, K. (2016). Impact evaluation of the national writing project's college-ready writing project in high poverty rural districts. *Society for Research on Educational Effectiveness*. ERIC Document Reproduction Service No. ED567632

- Garet, M., Heppen, J., Walters, K., Parkinson, J., Smith, T., Song, M., . . . Borman, G. (2016). *Focusing on teachers' mathematical content knowledge: Impact of content-intensive professional development*. (NCEE 2016-4010). Retrieved from <https://files.eric.ed.gov/fulltext/ED569154.pdf>
- Gates, S., Baird, M., Master, B., & Chavez-Herrerias, E. R. (2019). *Principal pipelines: A feasible, affordable, and effective way for districts to improve schools*. Santa Monica, CA: Rand Corporation. Retrieved from https://www.rand.org/pubs/research_reports/RR2666.html. Also available in print form.
- Gess-Newsome, J. (2015). A model of teacher professional knowledge and skill including PCK. *Re-examining pedagogical content knowledge in science education*, 41(7), 28-42. doi: 10.4324/9781315735665
- Goldhaber, D., Grout, C., & Huntington-Klein, N. (2015). Screen twice, cut once: Assessing the predictive validity of teacher selection tools. *Education Finance and Policy*, 12(2), 197-223. Doi: 10.1162/EDFP_a_00200
- Goldhaber, D., Lavery, L., & Theobald, R. (2015). Uneven playing field? Assessing the teacher quality gap between advantaged and disadvantaged students. *Educational Researcher*, 44(5), 293-307. doi:10.3102/0013189x15592622
- Graczewski, C., Knudson, J., & Holtzman, D. (2009). Instructional leadership in practice: What does it look like, and what influence does it have? *Journal of Education for Students Placed at Risk*, 14(1), 72-96. doi:10.1080/10824660802715460

- Grissom, J., Kalogrides, D., & Loeb, S. (2017). Strategic staffing? How performance pressures affect the distribution of teachers within schools and resulting student achievement. *American Educational Research Journal*, 54(6), 1079-1116.
doi:10.3102/0002831217716301
- Grupka, P. (2015). *Exploring teacher hiring: Are we asking the right questions*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses Global.
(1658213601)
- Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, 18(1), 50-82.
doi:10.1177/1525822x05279903
- Gurley, D. K., Anast-May, L., O'Neal, M., & Dozier, R. (2016). Principal instructional leadership behaviors: Teacher vs. self-perceptions. *International Journal of Educational Leadership Preparation*, 11(1), n1. Retrieved from
<https://files.eric.ed.gov/fulltext/EJ1103651.pdf>
- Harris, A. (2014). Distributed leadership: Implications for the role of the principal. *Journal of Management Development*, 31(1), 7-17.
- Hatch, J. (2013). *Early childhood qualitative research*. New York, NY: Routledge. doi:
10.4324/9789293943592
- Hill, H., Schilling, S., & Ball, D. L. (2004). Developing measures of teachers' mathematics knowledge for teaching. *Elementary School Journal*, 105(1), 11-30.
doi:10.1086/428763

- Horrocks, B. (2019). Six key elements identified in an active and thriving blended community of practice. *TechTrends*, 63(2), 108-115. doi: 10.1007/s11528-018-0265-x
- Jabbar, H. (2017). Recruiting “talent”: School choice and teacher hiring in New Orleans. *Educational Administration Quarterly*, 54(1), 115-151. doi: 10.1177/0013161X17721607
- Jacob, B., Rockoff, J., Taylor, E., Lindy, B., & Rosen, R. (2016). *Teacher Applicant Hiring and Teacher Performance: Evidence from DC Public Schools* (No. w22054). National Bureau of Economic Research. Retrieved from http://www.edpolicy.umich.edu/files/03-2016_teacher-applicant-hiring-and-performance.pdf
- Kaiser, K. (2009). Protecting respondent confidentiality in qualitative research. *Qualitative Health Research*, 19(11), 1631-1641. doi:10.1177/1049732309350879
- Kaput, J., Carraher, D., & Blanton, M. (2017). *Algebra in the early grades*. New York, NY: Routledge. doi: 10/4324/9781315097435
- Karlof, B., Lundgren, K., & Froment, M. E. (2001). *Benchlearning: Good examples as a lever for development*. New York, NY: Halsted Press. doi: 10.5555/559769
- Kearney, W., & Valadez, A. (2015). Ready from day one: An examination of one principal preparation program's redesign in collaboration with local school districts. *Educational Leadership and Administration: Teaching and Program Development*, 26, 27-38. Retrieved from <https://eric.ed.gov/?id=EJ1062264>

- Kermani, H., & Aldemir, J. (2015). Preparing children for success: integrating science, math, and technology in early childhood classroom. *Early Child Development and Care*, 185(9), 1504-1527. doi:10.1080/03004430.2015.1007371
- Learning Forward. (2017). *A new vision for professional learning*. Retrieved from <https://learningforward.org/docs/default-source/getinvolved/essa/essanewvisiontoolkit>
- Leithwood, K., Louis, K., Anderson, S., & Wahlstrom, K. (2004). *How leadership influences student learning. Review of research*. Wallace Foundation, ERIC Document Reproduction Service No. ED485932.
- Leithwood, K., Louis, K. S., Wahlstrom, K., Anderson, S., Mascall, B., & Gordon, M. (2010). In A. Hargreaves, A. Lieberman, M. Fullan, & D. Hopkins (Eds.), *How successful leadership influences student learning: The second installment of a longer story, Second international handbook of educational change* (pp. 611-629). doi:10.1007/978-90-481-2660-6
- Lewis, S., & Holloway, J. (2019). Datafying the teaching ‘profession’: Remaking the professional teacher in the image of data. *Cambridge Journal of Education*, 49(1), 35-51. doi:10.1080/0305764x.2018.1441373
- Liu, S., Liu, C., Stronge, J., & Xu, X. (2016). Teacher characteristics for success in the classroom: Chinese principals’ perceptions for hiring decisions. *Asia Pacific Education Review*, 17(1), 107-120. doi:10.1007/s12564-015-9412-7
- Lodico, M., Spaulding, D., & Voegtle, K. (2010). *Methods in educational research: From theory to practice* (2nd ed.). San Francisco, CA: Jossey-Bass.

- Lofthouse, R. (2019). Coaching in education: A professional development process in formation. *Professional Development in Education*, 45(1), 33-45.
- No Child Left Behind Act of 2001, Pub. L. 107-110, 20 U.S.C. § 6319 (2002).
- Ma, L. (1999). *Knowing and teaching elementary mathematics: Teachers' understanding of fundamental mathematics in China and the United States*. Mahwah, NJ: Lawrence Erlbaum.
- Ma, L. (2010). *Knowing and teaching elementary mathematics: Teachers' understanding of fundamental mathematics in China and the United States* (Anniversary ed.). New York, NY: Taylor and Francis.
- Martinovic, D., Horn-Olivito, H., & el Kord, N. (2017). Content leadership in mathematics education: A literature review. *Mathematics Knowledge Network*, Ontario, Canada: Ontario Ministry of Education. Retrieved from <http://mkn-rcm.ca/wp-content/uploads/2016/11/Lit-Review-paper-ML-CoP-2017-08-16.pdf>
- Merriam, S. (2009). *Qualitative research: A guide to design and implementation*. San Francisco, CA: Jossey-Bass.
- Morgan, D., & Bates, C. (2018). Addressing the barriers of time. *Reading Teacher*, 72(1), 131-134. doi:10.1002/trtr.1716
- National Academies of Sciences, Engineering, and Medicine. (2018). *How people learn II: Learners, contexts, and cultures*. Washington, DC: The National Academies Press. doi:10.17226/24783

- National Center for Educational Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. (2016). Retrieved from <https://ies.ed.gov/ncee/pubs/20164010/pdf/20164010.pdf>
- National Center for Educational Statistics. (2015). *Trends in international mathematics and science study*. Retrieved from <https://nces.ed.gov/timss/>
- National Center for Educational Statistics. (2016). *The nation's report card*. Retrieved from <http://www.nationsreportcard.gov/>
- National Center for Educational Statistics. (2017). *Digest of educational statistics*. Retrieved from https://nces.ed.gov/programs/digest/d17/tables/dt17_211.60.asp?current=yes
- National Center for Educational Statistics. (2019). *The nation's report card*. Retrieved from <http://www.nationsreportcard.gov/>
- National Policy Board for Educational Administration. (2017). *Professional standards for educational leaders*. Retrieved from <https://ccsso.org/sites/default/files/2017-10/ProfessionalStandardsforEducationalLeaders2015forNPBEAFINAL.pdf>
- Ng, F. (2019). Instructional leadership. In B. Wong, S. Hairon, & P. Ng (Eds.), *School leadership and educational change in Singapore* (pp. 7-30). doi:10.1007/978-3-319-74746-0_2
- Ng, S., & Szeto, S. (2016). Preparing school leaders: The professional development needs of newly appointed principals. *Educational Management Administration & Leadership*, 44(4), 540-557.

- Nix, S., Perez-Felkner, L., & Thomas, K. (2015). Perceived mathematical ability under challenge: a longitudinal perspective on sex segregation among STEM degree fields. *Frontiers in Psychology, 6*, 530. doi:10.3389/fpsyg.2015.00530
- Odden, A., & Kelly, J. (2008). *Strategic management of human capital in public education*. Madison, WI: Consortium for Policy Research in Education.
- Ottmar, E., Decker, L., Cameron, C., Curby, T., & Rimm-Kaufman, S. (2014). Classroom instructional quality, exposure to mathematics instruction and mathematics achievement in fifth grade. *Learning Environments Research, 17*(2), 243-262. doi:10.1007/s10984-013-9146.6
- Parker, A., Rakes, L., & Arndt, K. (2017, July). Departmentalized, self-contained, or somewhere in between: understanding elementary grade-level organizational decision-making. *Educational Forum, 81*(3), 236-255. doi: 10.1080/00131725.2017.1314569
- Paterson, G. D. (2019). Improving student learning through professional learning communities: Employing a system-wide approach. *Canadian Journal for New Scholars in Education/Revue canadienne des jeunes chercheuses et chercheurs en éducation, 10*(1).
- Phillips, J., Phillips, P., & Elkeles, T. (2016). *Chief talent officer*. London: Routledge. doi: 10.4324/9781315796048
- Polly, D., Wang, C., Lambert, R., Martin, C., McGee, J. Pugalee, D., Lewhew, A. (2017). Supporting Kindergarten teachers' mathematics instruction and student achievement through a curriculum-based professional development program.

Early Childhood Education Journal, 45(1), 121-121. doi: 10.1007/s10643-13-0605-6

Prestridge, S., & Main, K. (2018). Teachers as drivers of their professional learning through design teams, communities, and networks. In J. Voogy, G. Knezek, R. Christensen, & K. Lai (Eds.), *Second handbook of information technology in primary and secondary education* (pp. 433-447). Basel, Switzerland: Springer. doi: 10.1007/978-3-319-53803-7

Randolph, J. (2009). A guide to writing the dissertation literature review. *Practical Assessment, Research, and Evaluation*, 14(1), 1-13. Retrieved from <https://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1219&context=pars>

Sanzo, K. (2016). *Strategies for developing and supporting school leaders: Stepping stones to great leadership*. New York, NY: Routledge.

Sax, L., Kanny, M., Riggers-Piehl, T., Whang, H., & Paulson, L. (2015). "But I'm not good at math": The changing salience of mathematical self-concept in shaping women's and men's STEM aspirations. *Research in Higher Education*, 56(8), 813-842. doi:10.1007/s11162-015-9375-x

Schachter, R., Gerde, H., & Hatton-Bowers, H. (2019). Guidelines for selecting professional development for early childhood teachers. *Early Childhood Education Journal*, 47(4), 395-408.

Schoenfeld, A. (2014). What makes for powerful classrooms, and how can we support teachers in creating them? A story of research and practice, productivity

intertwined. *Educational Researcher*, 43(8), 404-412. doi:

10.3102/0013189X14554450

Schumacher, G., Grigsby, B., & Vesey, W. (2015). Determining effective teaching behaviors through the hiring process. *International Journal of Educational Management*, 29(1), 139-155. doi:10.1108/ijem-04-2013-0071

Seidman, I. (2013). *Interviewing as qualitative research: A guide for researchers in education and the social sciences*. New York, NY: Teachers College Press.

Sherman, R., & Webb, R. (2001). *Qualitative research in education: Focus and methods*. New York, NY: Routledge Falmer.

Sithole, A., Chiyaka, E. T., McCarthy, P., Mupinga, D. M., Bucklein, B. K., & Kibirige, J. (2017). Student attraction, persistence and retention in STEM programs: Successes and continuing challenges. *Higher Education Studies*, 7(1), 46-59. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1126801.pdf>

Southern Regional Education Board. (2010). The three essentials: Improving schools requires district vision, district and state support, and principal leadership. Retrieved from https://www.sreb.org/sites/main/files/file-attachments/10v16_three_essentials.pdf

Spanneut, G., Tobin, J., & Ayers, S. (2012). Identifying the professional development needs of public school principals based on the interstate school leader licensure consortium standards. *NASSP Bulletin*, 96(1), 67-88. doi:10.1177/0192636512439230

- Stake, R. (1995). *The art of case study research*. Thousand Oaks, CA: Sage Publications.
- Stake, R. (2010). *Qualitative research: Studying how things work*. New York, NY: Guildford.
- Steele, M., Johnson, K., Otten, S., Herbel-Eisenmann, B., & Carver, C. (2015). Improving instructional leadership through the development of leadership content knowledge: The case of principal learning in algebra. *Journal of Research on Leadership Education*, 10(2), 127-150. doi:10.1177/1942775115569353
- Stein, M. K., & Nelson, B. S. (2003). Leadership content knowledge. *Educational Evaluation and Policy Analysis*, 25(4), 423-448. doi: 10.3102/01623737025004423
- Stronge, J. (2018). *Qualities of effective teachers*. Alexandria: VA: ASCD.
- Stronge, J., & Hindman, J. L. (2006). *The teacher quality index: A protocol for teacher selection*. Alexandria: VA: ASCD.
- Styron, R., & LeMire, S. (2009). Principal preparation programs: Perceptions of high school principals. *Journal of College Teaching & Learning*, 6(6), 51-62. doi:10.19030/tlc.v6i6.1135
- Tchoshanov, M., Cruz, M., Huereca, K., Khakirova, L., & Ibragimova, E. (2017). Examination of lower secondary mathematics teachers' content knowledge and its connection to students' performance. *International Journal of Science and Mathematics Education*, 15(4), 683-702. doi: 10.1007/s10763-015-9703-9

- Tella, A. (2017). Teacher variables as predictors of academic achievement of primary school pupils' mathematics. *International Electronic Journal of Elementary Education, 1*(1), 16-33.
- Thanheiser, E., Browning, C., Edson, A., Lo, J., Whitacre, I., Olanoff, D., & Morton, C. (2014). Prospective elementary mathematics teacher content knowledge: What do we know, what do we not know, and where do we go? *The Mathematics Enthusiast, 11*(2), 433. Retrieved from <https://scholarworks.umt.edu/cgi/viewcontent.cgi?article=1308&context=tme>
- Tooley, M., & Connally, K. (2016). *No panacea: Diagnosing what ails teacher professional development before reaching for remedies*. Washington, DC: New America. ERIC Document Reproduction Service No. ED570895
- U.S. Department of Commerce, (2018). *Spotlight on US educational attainment*. United States Census Bureau. Retrieved from <https://performance.commerce.gov/stories/s/U-S-Population-Spotlight-Educational-Attainment/na47-j74r/>
- U.S. Department of Education, (2018). *Race to the top district competition draft, definitions*. Retrieved from <https://www.ed.gov/race-top/district-competition/definitions>
- U.S. Department of Labor, Bureau of Labor Statistics. (2018). *Occupational employment statistics*. Retrieved from <https://www.bls.gov/oes/home.htm>

- Vomberg, A., Homburg, C., & Bornemann, T. (2015). Talented people and strong brands: The contribution of human capital and brand equity to firm value. *Strategic Management Journal*, 36(13), 2122-2131.
- Wallace Foundation. (2011). *The school principal as leader: Guiding schools to better teaching and learning*. Retrieved from <https://www.wallacefoundation.org/knowledge-center/Documents/The-School-Principal-as-Leader-Guiding-Schools-to-Better-Teaching-and-Learning.pdf>
- Webb, L. D., & Norton, M. S. (2013). *Human resources administration: Personnel issues and needs in education* (6th ed.). Upper Saddle River, NJ: Prentice Hall.
- Webel, C., Conner, K. A., Sheffel, C., Tarr, J. E., & Austin, C. (2017). Elementary mathematics specialists in “departmentalized” teaching assignments: Affordances and constraints. *Journal of Mathematical Behavior*, 46, 196-214.
doi:10.1016/j.jmathb.2016.12.006
- Webster, I. (2020). US inflation rate: 2009-2019. Retrieved from <https://www.in2013dollars.com/us/inflation/2009?endYear=2019&amount=100>
- Wei, R. C., Darling-Hammond, L., & Adamson, F. (2010). *Professional development in the United States: Trends and challenges* (Vol. 28). Dallas, TX: National Staff Development Council. Retrieved from <https://edpolicy.stanford.edu/sites/default/files/publications/professional-development-united-states-trends-and-challenges.pdf>
- Williamson, R., & Blackburn, B. (2016). *The principalship from A to Z*. New York, NY: Routledge.

Wolcott, H. (1990). *Writing up qualitative research*. Newbury Park, CA: Sage

Publications.

World Association of Public Employment Services. (2017). *Benchlearning*. Retrieved

from <http://wapes.org/en/news/benchlearning>

Zepeda, S. J. (2018). Coaching in the context of job-embedded professional learning. In

S. J. Zepeda, (Ed.), *The job-embedded nature of coaching: Lessons and insights*

for school leaders at all levels. Lanham, MD: Rowman & Littlefield Publishers.

Appendix A: Administrator Professional Learning Experience

Outline for 3-Day Professional Learning Experience

Overview of the Professional Learning Experience:

Attendees will consider their role as leaders in the area of human capital management through the lens of the Framework for Strategic Management of Human Capital in Public Education by Odden and Kelly (2008). Principals will apply the framework to the instructional quality in the content area of mathematics and consider practices for hiring and assigning math teachers.

Intended Audience:

Elementary School Principals and Assistant Principals, School District Administrators, School District Personnel working in Human Resources, Aspiring School Leaders

Need to be Addressed:

There was an identified need for professional learning for school leaders with regard to a framework for conducting matters of human capital management, especially in the area of hiring and assigning elementary school teachers in the content area of mathematics.

Objectives:

By the end of this professional learning experience, participants will have worked collaboratively to have developed an interview protocol to utilize in the process of hiring and assigning mathematics teachers in the elementary school setting.

Overview:

Participants will engage in an active learning environment to develop an understanding of the Framework for Strategic Management of Human Capital in Public Education by Odden and Kelly (2008). Participants will apply components of the framework in the context of hiring and assigning teachers to mathematics classrooms. Instructional quality and content knowledge in elementary mathematics will be reviewed. Equipped with new learning, participants will work together to develop a protocol to pilot when hiring and assigning teachers in the content area of mathematics. Participants will work together over the school year as the newly developed protocol is implemented.

This professional learning experience was developed by Kathleen Schofield for the purpose of closing gaps in knowledge with regard to human capital management practices in the content area of mathematics. After reviewing the current literature in adult professional learning, I developed this professional learning experience to incorporate recommended best practices into the learning experience.

Detailed Agenda

Human Capital Management Strategies in the Context of Mathematics

Day 1:

Welcome and Introductions

- Facilitator welcomes the group and introduce them self and the facilitation team.
- Facilitator reviews logistics (restrooms, lunch arrangements, parking, etc.)
- Facilitator reviews agenda for the three days.
- Facilitator introduces ice breaker.

Ice Breaker Activity - Fold the Line

Principals will get to know one another by mingling by forming a line based on how close to the training location each principal was born. Once the line is formed, principals will introduce themselves, state where they were born, and state one thing that they hope to gain from the training.

Once all participants have introduced themselves, they will be instructed to fold the line so that they each have a partner to work with. The facilitator will lead by providing discussion prompts. Participants will be given 5 minutes to discuss the prompt, and then responses will be shared with the group. A member of the facilitation team will chart key ideas as the pairs share out. After each prompt, the participants will shift one space so that they have a new partner to work with.

- Discussion Prompt 1: In the context of human capital management, what are your greatest challenges when hiring teachers?

Teams share. Shift the line.

- Discussion Prompt 2: What factors do you consider to be out of your control when staffing your classrooms?

Teams share. Shift the line.

- Discussion Prompt 3: What specific challenges do you have when hiring math teachers or deciding who on your faculty to assign to teach mathematics?

Participants return to their seats.

Setting Group Norms

- Facilitator guides group through the development of norms for the training.

Morning Keynote Speaker – Principal as Human Resources Manager

- Facilitator introduces the morning keynote speaker.
- Speaker addresses the group.
- Participants listen to the keynote.
- Upon conclusion, facilitator leads participants through small group discussion at their table.

Break for Lunch

Welcome back and reminder about the norms.

Afternoon Session: A Framework for Human Capital Management.

- Participants are introduced to the Framework for Strategic Management of Human Capital in Public Education by Odden and Kelly (2008).

Jigsaw Activity, Part I

- Participants are given a portion of the framework to read.
- Participants are broken into groups based on the portion of the article that they are responsible for reading.
- Each group develops a presentation on the portion of the framework that they have been assigned.
- Participants are given time to prepare their presentation.

Jigsaw Activity, Part II

- Each group presents the material that they have prepared.

Jigsaw Activity, Part III

- Table discuss the implications of the framework.
- Tables discuss the implications of the framework for local practice.
- Whole group discussion ensues, guided by facilitator.

Facilitator concludes the day by revisiting the norms and distributing exit tickets to participants.

Participants complete exit tickets and are dismissed for the day.

- Exit Slip Content:
 - What parts of the framework align with your current human capital management practices?
 - What challenges do you see as you consider implementing components of the framework into your human capital management practices?

- What questions do you have from today's session?

End of Day 1

Day 2:

Welcome Back and Overview of the Day

- Facilitator welcomes the group and recaps the exit ticket findings.
- Facilitator reviews logistics (restrooms, lunch arrangements, parking, etc.).
- Facilitator reviews agenda for Day 2.
- Facilitator recaps norms.
- Facilitator introduces warm-up activity.

Warm Up Activity

- Posters with statements about mathematics instruction are placed on the walls in corners of the room.
- Participants do a gallery walk and read all the posters.
- Participants return to the poster that most resonates with them.
- Participants engage in a small group discussion about the content on the poster.
- Participants create a chart summarizing their discussion.
- Groups rotate to read the content that has been created by each small group.

Participants return to their seats.

Morning Keynote Speaker: Instructional Quality in Mathematics

- Facilitator introduces the morning keynote speaker.
- Speaker addresses the group.

- Participants listen to the keynote.
- Upon conclusion, facilitator leads participants through small group discussion at their table.

Break for Lunch

Welcome back and reminder about the norms.

Afternoon Session: A Deep Dive into Teacher Content Knowledge and Instructional Quality

- Participants are given a short survey to complete as a preassessment of their own content knowledge in mathematics.
- Participants electronically input their self-reported data.
- The data are consolidated and viewed by the group as a starting point for discussion.

Instructional Quality Activity, Part I

- Participants are asked to work as a group to develop a list of the things that they look for when they are conducting formal and informal observations and walk-throughs in mathematics classrooms.
- Participants share their lists with the whole group.
- Facilitator captures the content from the lists in a Google survey document.
- The group comes to consensus of the critical “look fors” when conducting observations in mathematics classrooms.

Instructional Quality Activity, Part II

- The list of characteristics is pushed out digitally to each participant.
- Participants reflect on each point and rate the state of instructional quality in mathematics in their school.

Instructional Quality Activity, Part III

- The facilitator reveals the findings from the survey.
- Table groups discuss the implications of the findings from the survey.
- Facilitated table discussion centers around the following prompts:
 - What surprised you about the findings from the survey?
 - What is the most important trend from these data?
 - Think about student achievement in mathematics at your school.
 - Do the data make sense when you consider student achievement?

Facilitator concludes the day by revisiting the norms and distributing exit tickets to participants.

Participants complete exit tickets and are dismissed for the day.

- Exit Slip Content:
 - What challenges do you face as an instructional leader as you observe mathematics instruction in your school?
 - What support would be helpful to you to overcome these challenges?
 - What questions do you have from today's session?

End of Day 2

Day 3

Welcome Back and Overview of the Day

- Facilitator welcomes the group and recaps the exit ticket findings.
- Facilitator reviews logistics (restrooms, lunch arrangements, parking, etc.).
- Facilitator reviews agenda for Day 3.
- Facilitator recaps norms.
- Facilitator introduces warm-up activity.

Warm Up Activity

- Principals jot the questions that they ask during an interview to assess a candidate's background knowledge and ability to adequately teach mathematics to students.
- Participants are instructed to list just one question on each post it note.
- Principals are placed into groups to compare their post its and organize the questions into a concept map.
- The concept maps are set aside for the afternoon activity.

Participants return to their seats.

Morning Keynote Speaker: Now That We Know, What do We Do?

- Facilitator introduces the morning keynote speaker.
- Speaker addresses the group.
- Participants listen to the keynote.

- Upon conclusion, facilitator leads participants through small group discussion at their table.

Break for Lunch

Welcome back and reminder about the norms.

Afternoon Session: Strategies for Hiring, Assigning and Developing Teachers to Maximize Student Learning

- Participants are given a individual math assessment data from their school.
- Participants complete an online survey making a statement about their student data in the context of instructional quality in mathematics.

Hiring and Placing Math Teachers Activity, Part I

- Participants are asked to work in groups of three to develop a common list of interview questions based upon the concept maps that were developed in the morning.
- Each group of three shares their lists with the larger table group.
- The table group comes to consensus of the critical factors to look for when hiring and placing teachers into mathematics classrooms.

Hiring and Placing Math Teachers, Part II

- One participant remains at each table and serves as the spokesperson for the group.
- The remaining participants move to the next table.

- Once seated at the new table, the spokesperson shares the list that their group developed.
- Visiting participants react to the content and take notes to bring back to their table group.

Hiring and Placing Math Teachers, Part III

- Table groups reunite and discuss their experience from visiting with the other groups.
- Groups modify their list, sequence it, and combine it into a draft protocol.
- Group spokesperson uploads the protocol to a shared document.
- Once all questions are uploaded, the facilitator pushes a link out to the group at large, and each individual rates the items on a Likert-like scale, ranking for importance.
- The findings are shared with the whole group in the form of a draft interview protocol.
- The draft protocol is discussed at each table group

Facilitator concludes the day by revisiting the norms and distributing exit tickets to participants.

Participants complete exit tickets and are dismissed for the day.

- Exit Slip Content:
 - What is not important to you that is on the current draft version of the protocol?

- What is missing from the protocol that you consider important?

End of Day 3

Professional Development Slide Deck

**Human Capital Management Strategies
in the Context of Mathematics**

Welcome Elementary School Principals!

Please Sign In
Help Yourself to Breakfast
Join your Group at your Assigned Seat

Lead Facilitator:
Kathleen Schofield

WALDEN UNIVERSITY
A higher degree. A higher purpose.

1

**Human Capital Management Strategies in the
Context of Mathematics – Overview of the Training**

- Welcome
- Introductions to team.
- Logistics for our time together.
- Rationale for the development of the program.
- High level overview of the professional learning.

www.WaldenU.edu

WALDEN UNIVERSITY
A higher degree. A higher purpose.

2

Gap In Practice

- A qualitative study was conducted in the region to gain information about the following research questions:
 - What human capital management practices and specific factors do elementary school principals perceive to be important with regard to making teaching assignments in mathematics?
 - What are the principal's preparedness, background and experiences with regard to both human capital management and with math instruction?
 - How do constraints in budget, salary scales, and applicant pools influence the principal's ability to recruit highly qualified teachers of mathematics to place in mathematics classrooms?

www.WaldenU.edu

WALDEN UNIVERSITY
A higher degree. A higher purpose.

3

Research Basis

- After conducting research from local school principals the literature on professional development was reviewed to learn about the current state of professional development.
 - Best practices for professional development
 - State of professional learning for school leaders
 - State of preparation of school leaders through formal learning experiences

www.WaldenU.edu

WALDEN UNIVERSITY
A higher degree. A higher purpose.

4

Developed for the Identified Need

- The professional development that will take place over the next three days is:
 - Based upon the need assessed through local data
 - Designed around best practices in professional learning for adults
 - Advances professional learning by addressing gaps in the formal principal preparation educational programs
 - Research based

5

Human Capital Management Strategies in the Context of Mathematics – Overview of the Training

- Principals will consider their role as leaders in the area of human capital management through the lens of the Framework for Strategic Management of Human Capital in Public Education by Odden and Kelly (2008).
- Principals will apply the framework to the instructional quality in the content area of mathematics and consider practices for hiring and assigning math teachers.

6

Human Capital Management Strategies in the Context of Mathematics – Program Goal

- Goal: By the end of our three days of professional development, our group will have developed a protocol to use when hiring and placing teachers to deliver instruction in mathematics.

7

Human Capital Management Strategies in the Context of Mathematics – Overview

Agenda for the Professional Development

- Day 1: A Framework for Human Capital Management
- Day 2: A Deep Dive into Teacher Content Knowledge and Instructional Quality
- Day 3: Hiring, Assigning and Developing Teachers to Maximize Student Learning

8

Group Norms:

As we work together over the next three days, consider these group norms.

- Respect Thoughts of Others
- Safe Place to Express Ideas
- Be Present, Fully Participate
- Minimize Use of Technology

Welcome to DAY 1

Kathleen Schofield, Lead Presenter

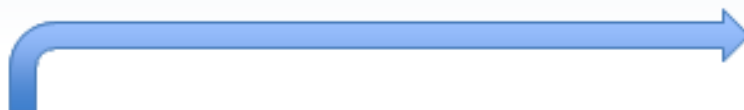
- ✓ Executive Director, NE Florida STEM2 Hub
- ✓ Dedicated Nonprofit Leader and Former Teacher/District Administrator

Our Mission: We convene, inspire, and invest in the STEM2 field by providing the essential missing elements to accelerate the growth of STEM2 education and careers.

- Now Let's Get to Know Each Other!

Activity: Fold the Line

- Mingle to discover where each of your peers was born.
- Form a line based on your place of birth in relationship to this training center.



11

Activity: Fold the Line

- Mingle to discover where each of your peers was born.
- Form a line based on your place of birth in relationship to this training center.

Now that we have formed the line please share:

- Your Name
- Your School
- Your Birthplace

12

Activity: Fold the Line

- Now Fold the Line so that You Have a Partner!



13

Activity: Fold the Line

- Introduce yourself to your partner.
- Discuss the following with your partner:
 - In the context of human capital management, what are your greatest challenges when hiring teachers?

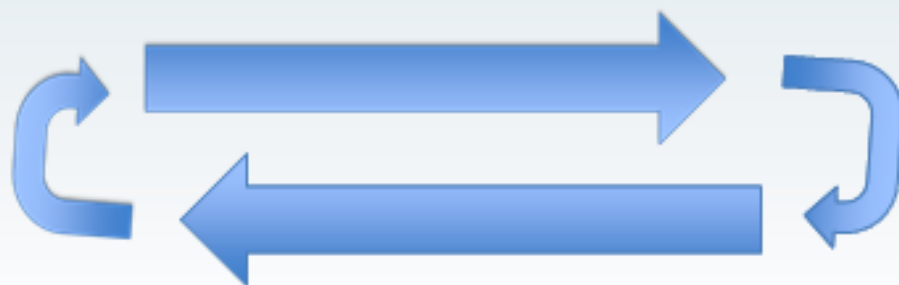
14

Activity: Fold the Line

- Introduce yourself to your partner.
- Discuss the following with your partner:
 - In the context of human capital management, what are your greatest challenges when hiring teachers?
 - Share with the group.
- Shift the line so you have a new partner.

15

Activity: Fold the Line



- Shift the line so you have a new partner.

16

Activity: Fold the Line

- With you new partner, discuss:
 - What factors do you consider to be out of your control when staffing your classrooms?

17

Activity: Fold the Line

- With you new partner, discuss:
 - What factors do you consider to be out of your control when staffing your classrooms?
 - Share with the group.
- Shift the line so you have a new partner.

18

Activity: Fold the Line

- With you new partner, discuss:
 - What specific challenges do you have when hiring math teachers or deciding who on your faculty to assign to teach mathematics?

Activity: Fold the Line

- With you new partner, discuss:
 - What specific challenges do you have when hiring math teachers or deciding who on your faculty to assign to teach mathematics?
 - Share with the group.
- Return to you seat.

Human Capital Management Strategies in the Context of Mathematics – Day 1

Today's Agenda:

- Keynote Speaker
- Facilitator Led Discussion
- Lunch
- Deep Dive and Jigsaw
- End of Day

21

Human Capital Management Strategies in the Context of Mathematics – Day 1

Welcome Keynote Speak:

Introduction to: A Framework for Strategic Management of Human Capital in Public Education by Odden and Kelly (2008)

22

Human Capital Management Strategies in the Context of Mathematics – Day 1

Facilitated Discussion:

A Framework for Strategic Management of Human Capital in Public Education by Odden and Kelly (2008)

23

Networking Lunch – Please Enjoy the Time to Network and Continue the Conversation



24

Human Capital Management Strategies in the Context of Mathematics – Day 1

A Deeper Dive: A Framework for Strategic Management of Human Capital in Public Education by Odden and Kelly (2008)

Jigsaw Activity, Part I

- Participants are given a portion of the framework to read.
- Participants are broken into groups based on the portion of the article that they are responsible for reading.
- Each group develops a presentation on the portion of the framework that they have been assigned.
- Participants are given time to prepare their presentation.

25

Human Capital Management Strategies in the Context of Mathematics – Day 1

A Deeper Dive: A Framework for Strategic Management of Human Capital in Public Education by Odden and Kelly (2008)

Jigsaw Activity, Part II

- Each group presents the material that they have prepared.

26

Human Capital Management Strategies in the Context of Mathematics – Day 1

A Deeper Dive: A Framework for Strategic Management of Human Capital in Public Education by Odden and Kelly (2008)

Jigsaw Activity, Part III

- Table discuss the implications of the framework.
- Tables discuss the implications of the framework for local practice.
- Whole group discussion ensues, guided by facilitator.

27

Human Capital Management Strategies in the Context of Mathematics – Wrapping Up Day 1

Revisit Norms –

- How Did We Do?
- Revisions Needed?

Group Norms:

- Respect Thoughts of Others
- Safe Place to Express Ideas
- Be Present, Fully Participate
- Minimize Use of Technology

28

Human Capital Management Strategies in the Context of Mathematics – Wrapping Up Day 1

Your Exit Ticket: Write to address the following:

- What parts of the framework align with your current human capital management practices?
- What challenges do you see as you consider implementing components of the framework into your human capital management practices?
- What questions do you have from today's session?

www.WaldenU.edu

WALDEN UNIVERSITY
A higher degree. A higher purpose.

29

End of Day 1: STAFF TIME

Staff Collects Exit Tickets
Review Data From Exit Tickets
Prepare Plan to Address Open Questions

Prepare for Day 2

WALDEN
UNIVERSITY
A higher degree. A higher purpose.

30

Human Capital Management Strategies in the Context of Mathematics Day 2

Welcome Back Elementary School
Principals!

Please Sign In
Help Yourself to Breakfast
Join your Group at your Assigned Seat

Lead Facilitator:
Kathleen Schofield

WALDEN
UNIVERSITY
A higher degree. A higher purpose.

31

Human Capital Management Strategies in the Context of Mathematics – Day 2

Today's Agenda:

- Warm Up Poster Gallery Walk
- Morning Keynote and Discussion
- Lunch
- Deep Dive – Instructional Quality in
Mathematic
- End of Day

www.WaldenU.edu

WALDEN UNIVERSITY
A higher degree. A higher purpose.

32

Group Norms:

As we work together over the next three days, consider these group norms.

- Respect Thoughts of Others
- Safe Place to Express Ideas
- Be Present, Fully Participate
- Minimize Use of Technology

Gallery Walk

- Around the room, there are posters for you to read.
- Independently visit and read each poster.
- After you have read each poster, return to the poster that most resonates with you.

Gallery Walk

- With the group at your poster, discuss the following:
 - What resonates with you about this poster?
 - How do these thoughts affect your perspective as an instructional leader?
 - What is actionable based on your discussion?
- Create a poster to capture your group discussion.

35

Gallery Walk

- As a team, visit the other posters that were created by the other groups.
- Discuss the poster and react to the poster.
- Leave a note with your group's consensus about the poster.

Once your team has visited and commented on all posters, return to your seat.

36

Human Capital Management Strategies in the
Context of Mathematics – Day 2

Welcome Keynote Speak:

Introduction to: Instructional Quality in the
Elementary Mathematics Classroom

www.WaldenU.edu

WALDEN UNIVERSITY
A higher degree. A higher purpose.

37

Human Capital Management Strategies in the
Context of Mathematics – Day 2

Facilitated Discussion:

Instructional Quality in the Elementary
Mathematics Classroom

www.WaldenU.edu

WALDEN UNIVERSITY
A higher degree. A higher purpose.

38

Networking Lunch – Please Sit at a Table with a Discussion Prompt that Interests You



www.WaldenU.edu

WALDEN UNIVERSITY
A higher degree. A higher purpose.

39

A Deep Dive into Teacher Content Knowledge and Instructional Quality

A Deeper Dive: Instructional Quality in Mathematics

Revisit Norms: How are we doing?

Take on-line Preassessment Survey

www.WaldenU.edu

WALDEN UNIVERSITY
A higher degree. A higher purpose.

40

A Deep Dive into Teacher Content Knowledge and Instructional Quality

Instructional Quality Activity, Part I:

- Participants are asked to work as a group to develop a list of the things that they look for when they are conducting formal and informal observations and walk-throughs in mathematics classrooms.
- Participants share their lists with the whole group.
- Facilitator captures the content from the lists in a Google survey document.
- The group comes to consensus of the critical “look fors” when conducting observations in mathematics classrooms.

41

A Deep Dive into Teacher Content Knowledge and Instructional Quality

Instructional Quality Activity, Part II:

- The list of characteristics is pushed out digitally to each participant.
- Participants reflect on each point and rate the state of instructional quality in mathematics in their school.

42

A Deep Dive into Teacher Content Knowledge and Instructional Quality

Instructional Quality Activity, Part III:

- The facilitator reveals the findings from the survey.
- Table groups discuss the implications of the findings from the survey.

43

A Deep Dive into Teacher Content Knowledge and Instructional Quality

Instructional Quality Activity, Part III:

- Facilitated table discussion centers around the following prompts:
 - What surprised you about the findings from the survey?
 - What is the most important trend from these data?
 - Think about student achievement in mathematics at your school.
 - Do the data make sense when you consider student achievement?

44

Human Capital Management Strategies in the Context of Mathematics – Wrapping Up Day 2

Revisit Norms –

- How Did We Do?
- Revisions Needed?

Group Norms:

- Respect Thoughts of Others
- Safe Place to Express Ideas
- Be Present, Fully Participate
- Minimize Use of Technology

Human Capital Management Strategies in the Context of Mathematics – Wrapping Up Day 2

Your Exit Ticket: Write to address the following:

- What challenges do you face as an instructional leader as you observe mathematics instruction in your school?
- What support would be helpful to you to overcome these challenges?
- What questions do you have from today's session?

End of Day 2: STAFF TIME

Staff Collects Exit Tickets
Review Data From Exit Tickets
Prepare Plan to Address Open Questions

Prepare for Day 3

WALDEN
UNIVERSITY
A higher degree. A higher purpose.

47

Human Capital Management Strategies in the Context of Mathematics Day 3

Welcome Back Elementary School
Principals!

Please Sign In
Help Yourself to Breakfast
Join your Group at your Assigned Seat

Lead Facilitator:
Kathleen Schofield

WALDEN
UNIVERSITY
A higher degree. A higher purpose.

48

Human Capital Management Strategies in the Context of Mathematics – Day 3

Today's Agenda:

- Warm Up Activity
- Morning Keynote and Discussion
- Hiring and Placing Math Teachers
- Next Steps and Moving Forward
- End of Day

Group Norms:

Let's Review of Group Norms:

- Respect Thoughts of Others
- Safe Place to Express Ideas
- Be Present, Fully Participate
- Minimize Use of Technology

Morning Warm Up Activity – Concept Mapping Interview Practices

Quietly Reflect on Your Interview Process

- Using Post-It notes, jot the questions that you ask during an interview to assess a candidate's background knowledge and ability to adequately teach mathematics to students.
- Use one Post-It note per question or thought.

51

Morning Warm Up Activity – Concept Mapping Interview Practices

Organize Your Thoughts...

- With a group of three, organize your Post-It notes conceptually.
- Develop your ideas into a concept map.

52

Data Review – Mathematical Achievement in Your Building

- Review the math data from your school.
- Discuss with peers at your table.

53

Individual School Data Review

- We will now complete an online survey making a statement about their student data in the context of instructional quality in mathematics.

54

Data Review – Mathematical Achievement in Your Building

Review the data from the on-line survey as a group.

- What thoughts did you have as you reviewed your school data?
- What thoughts did you have as you reviewed the on-line assessment from the group?
- What surprised you about the data?

Human Capital Management Strategies in the Context of Mathematics – Day 3

Welcome Keynote Speak:

Now That We Know, What Do We Do?

Human Capital Management Strategies in the Context of Mathematics – Day 3

Reflection on Keynote – Facilitated Discussion

- What thoughts did you have as you listened to the keynote?
- What resonated with your school?
- What actions might you take?

57

Networking Lunch – Please Enjoy the Time with a Principal You Have Not Connect With Yet



58

Working Groups – Concept Mapping

Afternoon Session: Participants are asked to work in groups of three to develop a common list of interview questions based upon the concept maps that were developed in the morning.

- Each group of three shares their lists with the larger table group.
- The table group comes to consensus of the critical factors to look for when hiring and placing teachers into mathematics classrooms.

Human Capital Management Strategies in the Context of Mathematics – Day 3

A Deeper Dive: Hiring and Placing Math Teachers

Hiring and Placing Math Teachers, Part I:

- Participants are asked to work in groups of three to develop a common list of interview questions based upon the concept maps that were developed in the morning.
- Each group of three shares their lists with the larger table group.
- The table group comes to consensus of the critical factors to look for when hiring and placing teachers into mathematics classrooms.

Human Capital Management Strategies in the Context of Mathematics – Day 3

A Deeper Dive: Hiring and Placing Math Teachers

Hiring and Placing Math Teachers, Part II:

- One participant remains at each table and serves as the spokesperson for the group.
- The remaining participants move to the next table.
- Once seated at the new table, the spokesperson shares the list that their group developed.
- Visiting participants react to the content and take notes to bring back to their table group.

Human Capital Management Strategies in the Context of Mathematics – Day 3

A Deeper Dive: Hiring and Placing Math Teachers

Hiring and Placing Math Teachers, Part III:

- Table groups reunite and discuss their experience from visiting with the other groups.
- Groups modify their list, sequence it, and combine it into a draft protocol.
- Group spokesperson uploads the protocol to a shared document.

Human Capital Management Strategies in the Context of Mathematics – Day 3

A Deeper Dive: Hiring and Placing Math Teachers

Hiring and Placing Math Teachers, Part III:

- Once all questions are uploaded, the facilitator pushes a link out to the group at large, and each individual rates the items on a Likert-like scale, ranking for importance.
- The findings are shared with the whole group in the form of a draft interview protocol.
- The draft protocol is discussed at each table group.

Human Capital Management Strategies in the Context of Mathematics – Wrapping Up Day 3

Revisit Norms –

- How Did We Do?
- Revisions Needed as We Continue to Work Together as a District Team?

Group Norms:

- Respect Thoughts of Others
- Safe Place to Express Ideas
- Be Present, Fully Participate
- Minimize Use of Technology

Strategies for Hiring, Assigning and Developing Teachers to Maximize Student Learning – Wrapping Up Day 3

Your Exit Ticket: Write to address the following:

- What is not important to you that is on the current draft version of the protocol?
- What is missing from the protocol that you consider important?
- What questions do you have from the three-day professional development and plan going forward?

65

End of Day 3: STAFF TIME

- Staff Collects Exit Tickets
- Review Data From Exit Tickets
- Prepare Plan to Address Open Questions
- Prepare for Follow-Up and On-Going Work

66

Human Capital Management Strategies in the Context of Mathematics

Welcome Elementary School Principals!

Please Sign In
Help Yourself to Breakfast
Join your Group at your Assigned Seat

Lead Facilitator:
Kathleen Schofield

WALDEN
UNIVERSITY

A higher degree. A higher purpose.

1

Human Capital Management Strategies in the Context of Mathematics – Overview of the Training

- Welcome
- Introductions to team.
- Logistics for our time together.
- Rationale for the development of the program.
- High level overview of the professional learning.

www.WaldenU.edu

WALDEN UNIVERSITY

A higher degree. A higher purpose.

2

Gap In Practice

- A qualitative study was conducted in the region to gain information about the following research questions:
 - What human capital management practices and specific factors do elementary school principals perceive to be important with regard to making teaching assignments in mathematics?
 - What are the principal's preparedness, background and experiences with regard to both human capital management and with math instruction?
 - How do constraints in budget, salary scales, and applicant pools influence the principal's ability to recruit highly qualified teachers of mathematics to place in mathematics classrooms?

www.WaldenU.edu

WALDEN UNIVERSITY
A higher degree. A higher purpose.

3

Research Basis

- After conducting research from local school principals the literature on professional development was reviewed to learn about the current state of professional development.
 - Best practices for professional development
 - State of professional learning for school leaders
 - State of preparation of school leaders through formal learning experiences

www.WaldenU.edu

WALDEN UNIVERSITY
A higher degree. A higher purpose.

4

Developed for the Identified Need

- The professional development that will take place over the next three days is:
 - Based upon the need assessed through local data
 - Designed around best practices in professional learning for adults
 - Advances professional learning by addressing gaps in the formal principal preparation educational programs
 - Research based

5

Human Capital Management Strategies in the Context of Mathematics – Overview of the Training

- Principals will consider their role as leaders in the area of human capital management through the lens of the Framework for Strategic Management of Human Capital in Public Education by Odden and Kelly (2008).
- Principals will apply the framework to the instructional quality in the content area of mathematics and consider practices for hiring and assigning math teachers.

6

Human Capital Management Strategies in the Context of Mathematics – Program Goal

- Goal: By the end of our three days of professional development, our group will have developed a protocol to use when hiring and placing teachers to deliver instruction in mathematics.

7

Human Capital Management Strategies in the Context of Mathematics – Overview

Agenda for the Professional Development

- Day 1: A Framework for Human Capital Management
- Day 2: A Deep Dive into Teacher Content Knowledge and Instructional Quality
- Day 3: Hiring, Assigning and Developing Teachers to Maximize Student Learning

8

Group Norms:

As we work together over the next three days, consider these group norms.

- Respect Thoughts of Others
- Safe Place to Express Ideas
- Be Present, Fully Participate
- Minimize Use of Technology

9

Welcome to DAY 1

Kathleen Schofield, Lead Presenter

- ✓ Executive Director, NE Florida STEM2 Hub
- ✓ Dedicated Nonprofit Leader and Former Teacher/District Administrator

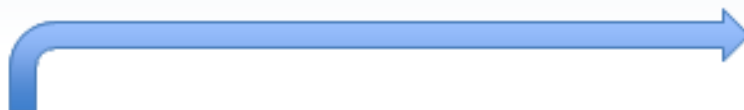
Our Mission: We convene, inspire, and invest in the STEM2 field by providing the essential missing elements to accelerate the growth of STEM2 education and careers.

- Now Let's Get to Know Each Other!

10

Activity: Fold the Line

- Mingle to discover where each of your peers was born.
- Form a line based on your place of birth in relationship to this training center.



11

Activity: Fold the Line

- Mingle to discover where each of your peers was born.
- Form a line based on your place of birth in relationship to this training center.

Now that we have formed the line please share:

- Your Name
- Your School
- Your Birthplace

12

Activity: Fold the Line

- Now Fold the Line so that You Have a Partner!



13

Activity: Fold the Line

- Introduce yourself to your partner.
- Discuss the following with your partner:
 - In the context of human capital management, what are your greatest challenges when hiring teachers?

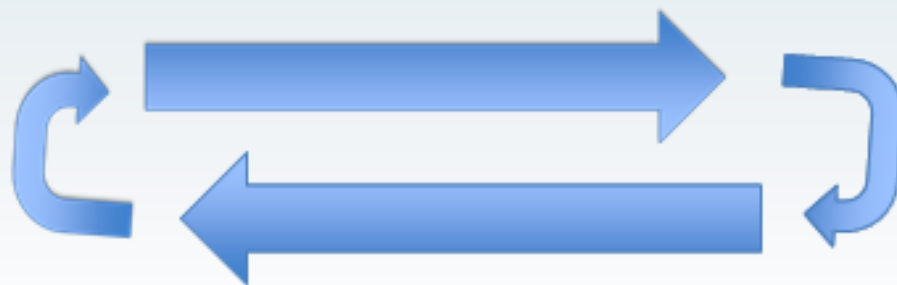
14

Activity: Fold the Line

- Introduce yourself to your partner.
- Discuss the following with your partner:
 - In the context of human capital management, what are your greatest challenges when hiring teachers?
 - Share with the group.
- Shift the line so you have a new partner.

15

Activity: Fold the Line



- Shift the line so you have a new partner.

16

Activity: Fold the Line

- With you new partner, discuss:
 - What factors do you consider to be out of your control when staffing your classrooms?

17

Activity: Fold the Line

- With you new partner, discuss:
 - What factors do you consider to be out of your control when staffing your classrooms?
 - Share with the group.
- Shift the line so you have a new partner.

18

Activity: Fold the Line

- With you new partner, discuss:
 - What specific challenges do you have when hiring math teachers or deciding who on your faculty to assign to teach mathematics?

19

Activity: Fold the Line

- With you new partner, discuss:
 - What specific challenges do you have when hiring math teachers or deciding who on your faculty to assign to teach mathematics?
 - Share with the group.
- Return to you seat.

20

Human Capital Management Strategies in the Context of Mathematics – Day 1

Today's Agenda:

- Keynote Speaker
- Facilitator Led Discussion
- Lunch
- Deep Dive and Jigsaw
- End of Day

21

Human Capital Management Strategies in the Context of Mathematics – Day 1

Welcome Keynote Speak:

Introduction to: A Framework for Strategic Management of Human Capital in Public Education by Odden and Kelly (2008)

22

Human Capital Management Strategies in the Context of Mathematics – Day 1

Facilitated Discussion:

A Framework for Strategic Management of Human Capital in Public Education by Odden and Kelly (2008)

23

Networking Lunch – Please Enjoy the Time to Network and Continue the Conversation



24

Human Capital Management Strategies in the Context of Mathematics – Day 1

A Deeper Dive: A Framework for Strategic Management of Human Capital in Public Education by Odden and Kelly (2008)

Jigsaw Activity, Part I

- Participants are given a portion of the framework to read.
- Participants are broken into groups based on the portion of the article that they are responsible for reading.
- Each group develops a presentation on the portion of the framework that they have been assigned.
- Participants are given time to prepare their presentation.

25

Human Capital Management Strategies in the Context of Mathematics – Day 1

A Deeper Dive: A Framework for Strategic Management of Human Capital in Public Education by Odden and Kelly (2008)

Jigsaw Activity, Part II

- Each group presents the material that they have prepared.

26

Human Capital Management Strategies in the Context of Mathematics – Day 1

A Deeper Dive: A Framework for Strategic Management of Human Capital in Public Education by Odden and Kelly (2008)

Jigsaw Activity, Part III

- Table discuss the implications of the framework.
- Tables discuss the implications of the framework for local practice.
- Whole group discussion ensues, guided by facilitator.

27

Human Capital Management Strategies in the Context of Mathematics – Wrapping Up Day 1

Revisit Norms –

- How Did We Do?
- Revisions Needed?

Group Norms:

- Respect Thoughts of Others
- Safe Place to Express Ideas
- Be Present, Fully Participate
- Minimize Use of Technology

28

Human Capital Management Strategies in the Context of Mathematics – Wrapping Up Day 1

Your Exit Ticket: Write to address the following:

- What parts of the framework align with your current human capital management practices?
- What challenges do you see as you consider implementing components of the framework into your human capital management practices?
- What questions do you have from today's session?

www.WaldenU.edu

WALDEN UNIVERSITY
A higher degree. A higher purpose.

29

End of Day 1: STAFF TIME

Staff Collects Exit Tickets
Review Data From Exit Tickets
Prepare Plan to Address Open Questions

Prepare for Day 2

WALDEN
UNIVERSITY
A higher degree. A higher purpose.

30

Human Capital Management Strategies in the Context of Mathematics Day 2

Welcome Back Elementary School
Principals!

Please Sign In
Help Yourself to Breakfast
Join your Group at your Assigned Seat

Lead Facilitator:
Kathleen Schofield

WALDEN
UNIVERSITY
A higher degree. A higher purpose.

31

Human Capital Management Strategies in the Context of Mathematics – Day 2

Today's Agenda:

- Warm Up Poster Gallery Walk
- Morning Keynote and Discussion
- Lunch
- Deep Dive – Instructional Quality in
Mathematic
- End of Day

www.WaldenU.edu

WALDEN UNIVERSITY
A higher degree. A higher purpose.

32

Group Norms:

As we work together over the next three days, consider these group norms.

- Respect Thoughts of Others
- Safe Place to Express Ideas
- Be Present, Fully Participate
- Minimize Use of Technology

Gallery Walk

- Around the room, there are posters for you to read.
- Independently visit and read each poster.
- After you have read each poster, return to the poster that most resonates with you.

Gallery Walk

- With the group at your poster, discuss the following:
 - What resonates with you about this poster?
 - How do these thoughts affect your perspective as an instructional leader?
 - What is actionable based on your discussion?
- Create a poster to capture your group discussion.

35

Gallery Walk

- As a team, visit the other posters that were created by the other groups.
- Discuss the poster and react to the poster.
- Leave a note with your group's consensus about the poster.

Once your team has visited and commented on all posters, return to your seat.

36

Human Capital Management Strategies in the
Context of Mathematics – Day 2

Welcome Keynote Speak:

Introduction to: Instructional Quality in the
Elementary Mathematics Classroom

www.WaldenU.edu

WALDEN UNIVERSITY
A higher degree. A higher purpose.

37

Human Capital Management Strategies in the
Context of Mathematics – Day 2

Facilitated Discussion:

Instructional Quality in the Elementary
Mathematics Classroom

www.WaldenU.edu

WALDEN UNIVERSITY
A higher degree. A higher purpose.

38

Networking Lunch – Please Sit at a Table with a Discussion Prompt that Interests You



www.WaldenU.edu

WALDEN UNIVERSITY
A higher degree. A higher purpose.

39

A Deep Dive into Teacher Content Knowledge and Instructional Quality

A Deeper Dive: Instructional Quality in Mathematics

Revisit Norms: How are we doing?
Take on-line Preassessment Survey

www.WaldenU.edu

WALDEN UNIVERSITY
A higher degree. A higher purpose.

40

A Deep Dive into Teacher Content Knowledge and Instructional Quality

Instructional Quality Activity, Part I:

- Participants are asked to work as a group to develop a list of the things that they look for when they are conducting formal and informal observations and walk-throughs in mathematics classrooms.
- Participants share their lists with the whole group.
- Facilitator captures the content from the lists in a Google survey document.
- The group comes to consensus of the critical “look fors” when conducting observations in mathematics classrooms.

41

A Deep Dive into Teacher Content Knowledge and Instructional Quality

Instructional Quality Activity, Part II:

- The list of characteristics is pushed out digitally to each participant.
- Participants reflect on each point and rate the state of instructional quality in mathematics in their school.

42

A Deep Dive into Teacher Content Knowledge and Instructional Quality

Instructional Quality Activity, Part III:

- The facilitator reveals the findings from the survey.
- Table groups discuss the implications of the findings from the survey.

43

A Deep Dive into Teacher Content Knowledge and Instructional Quality

Instructional Quality Activity, Part III:

- Facilitated table discussion centers around the following prompts:
 - What surprised you about the findings from the survey?
 - What is the most important trend from these data?
 - Think about student achievement in mathematics at your school.
 - Do the data make sense when you consider student achievement?

44

Human Capital Management Strategies in the Context of Mathematics – Wrapping Up Day 2

Revisit Norms –

- How Did We Do?
- Revisions Needed?

Group Norms:

- Respect Thoughts of Others
- Safe Place to Express Ideas
- Be Present, Fully Participate
- Minimize Use of Technology

Human Capital Management Strategies in the Context of Mathematics – Wrapping Up Day 2

Your Exit Ticket: Write to address the following:

- What challenges do you face as an instructional leader as you observe mathematics instruction in your school?
- What support would be helpful to you to overcome these challenges?
- What questions do you have from today's session?

End of Day 2: STAFF TIME

Staff Collects Exit Tickets
Review Data From Exit Tickets
Prepare Plan to Address Open Questions

Prepare for Day 3

WALDEN
UNIVERSITY
A higher degree. A higher purpose.

47

Human Capital Management Strategies in the Context of Mathematics Day 3

Welcome Back Elementary School
Principals!

Please Sign In
Help Yourself to Breakfast
Join your Group at your Assigned Seat

Lead Facilitator:
Kathleen Schofield

WALDEN
UNIVERSITY
A higher degree. A higher purpose.

48

Human Capital Management Strategies in the Context of Mathematics – Day 3

Today's Agenda:

- Warm Up Activity
- Morning Keynote and Discussion
- Hiring and Placing Math Teachers
- Next Steps and Moving Forward
- End of Day

Group Norms:

Let's Review of Group Norms:

- Respect Thoughts of Others
- Safe Place to Express Ideas
- Be Present, Fully Participate
- Minimize Use of Technology

Morning Warm Up Activity – Concept Mapping Interview Practices

Quietly Reflect on Your Interview Process

- Using Post-It notes, jot the questions that you ask during an interview to assess a candidate's background knowledge and ability to adequately teach mathematics to students.
- Use one Post-It note per question or thought.

51

Morning Warm Up Activity – Concept Mapping Interview Practices

Organize Your Thoughts...

- With a group of three, organize your Post-It notes conceptually.
- Develop your ideas into a concept map.

52

Data Review – Mathematical Achievement in Your Building

- Review the math data from your school.
- Discuss with peers at your table.

53

Individual School Data Review

- We will now complete an online survey making a statement about their student data in the context of instructional quality in mathematics.

54

Data Review – Mathematical Achievement in Your Building

Review the data from the on-line survey as a group.

- What thoughts did you have as you reviewed your school data?
- What thoughts did you have as you reviewed the on-line assessment from the group?
- What surprised you about the data?

Human Capital Management Strategies in the Context of Mathematics – Day 3

Welcome Keynote Speak:

Now That We Know, What Do We Do?

Human Capital Management Strategies in the Context of Mathematics – Day 3

Reflection on Keynote – Facilitated Discussion

- What thoughts did you have as you listened to the keynote?
- What resonated with your school?
- What actions might you take?

57

Networking Lunch – Please Enjoy the Time with a Principal You Have Not Connect With Yet



58

Working Groups – Concept Mapping

Afternoon Session: Participants are asked to work in groups of three to develop a common list of interview questions based upon the concept maps that were developed in the morning.

- Each group of three shares their lists with the larger table group.
- The table group comes to consensus of the critical factors to look for when hiring and placing teachers into mathematics classrooms.

Human Capital Management Strategies in the Context of Mathematics – Day 3

A Deeper Dive: Hiring and Placing Math Teachers

Hiring and Placing Math Teachers, Part I:

- Participants are asked to work in groups of three to develop a common list of interview questions based upon the concept maps that were developed in the morning.
- Each group of three shares their lists with the larger table group.
- The table group comes to consensus of the critical factors to look for when hiring and placing teachers into mathematics classrooms.

Human Capital Management Strategies in the Context of Mathematics – Day 3

A Deeper Dive: Hiring and Placing Math Teachers

Hiring and Placing Math Teachers, Part II:

- One participant remains at each table and serves as the spokesperson for the group.
- The remaining participants move to the next table.
- Once seated at the new table, the spokesperson shares the list that their group developed.
- Visiting participants react to the content and take notes to bring back to their table group.

Human Capital Management Strategies in the Context of Mathematics – Day 3

A Deeper Dive: Hiring and Placing Math Teachers

Hiring and Placing Math Teachers, Part III:

- Table groups reunite and discuss their experience from visiting with the other groups.
- Groups modify their list, sequence it, and combine it into a draft protocol.
- Group spokesperson uploads the protocol to a shared document.

Human Capital Management Strategies in the Context of Mathematics – Day 3

A Deeper Dive: Hiring and Placing Math Teachers

Hiring and Placing Math Teachers, Part III:

- Once all questions are uploaded, the facilitator pushes a link out to the group at large, and each individual rates the items on a Likert-like scale, ranking for importance.
- The findings are shared with the whole group in the form of a draft interview protocol.
- The draft protocol is discussed at each table group.

Human Capital Management Strategies in the Context of Mathematics – Wrapping Up Day 3

Revisit Norms –

- How Did We Do?
- Revisions Needed as We Continue to Work Together as a District Team?

Group Norms:

- Respect Thoughts of Others
- Safe Place to Express Ideas
- Be Present, Fully Participate
- Minimize Use of Technology

Strategies for Hiring, Assigning and Developing Teachers to Maximize Student Learning – Wrapping Up Day 3

Your Exit Ticket: Write to address the following:

- What is not important to you that is on the current draft version of the protocol?
- What is missing from the protocol that you consider important?
- What questions do you have from the three-day professional development and plan going forward?

65

End of Day 3: STAFF TIME

- Staff Collects Exit Tickets
- Review Data From Exit Tickets
- Prepare Plan to Address Open Questions

- Prepare for Follow-Up and On-Going Work

66

Human Capital Management Strategies in the Context of Mathematics
Professional Development Evaluation

Your feedback is important. Please rate your experience for each of the following professional development experiences using the following scale:

1 = Strongly Disagree 2 = Disagree 3 = Agree 4 = Strongly Agree

Day 1 Morning Session

Session Title: The Principal as Human Resources Manager

	1	2	3	4
Learning objectives were communicated clearly.				
The learning objectives were relevant to my work.				
The session activities helped me meet the learning objectives.				
The activities were engaging and met my needs as an adult learner.				
I plan to use what I learned in this session in my work at my campus.				

1. Considering only this session, what did you find effective or most helpful about this session?

2. Considering only this session, what areas could have been improved to better meet your needs?

Please rate your experience for each of the following professional development experiences using the following scale:

1 = Strongly Disagree 2 = Disagree 3 = Agree 4 = Strongly Agree

Day 1 Afternoon Session

Session Title: A Framework for Human Capital Management

	1	2	3	4
Learning objectives were communicated clearly.				
The learning objectives were relevant to my work.				
The session activities helped me meet the learning objectives.				
The activities were engaging and met my needs as an adult learner.				
I plan to use what I learned in this session in my work at my campus.				

1. Considering only this session, what did you find effective or most helpful about this session?

2. Considering only this session, what areas could have been improved to better meet your needs?

Please rate your experience for each of the following professional development experiences using the following scale:

1 = Strongly Disagree 2 = Disagree 3 = Agree 4 = Strongly Agree

Day 2 Morning Session:

Session Title: Instructional Quality in Mathematics

	1	2	3	4
Learning objectives were communicated clearly.				
The learning objectives were relevant to my work.				
The session activities helped me meet the learning objectives.				
The activities were engaging and met my needs as an adult learner.				
I plan to use what I learned in this session in my work at my campus.				

1. Considering only this session, what did you find effective or most helpful about this session?

2. Considering only this session, what areas could have been improved to better meet your needs?

Please rate your experience for each of the following professional development experiences using the following scale:

1 = Strongly Disagree 2 = Disagree 3 = Agree 4 = Strongly Agree

Day 2 Afternoon Session

Session Title: A Deep Dive into Teacher Content Knowledge and Instructional Quality

	1	2	3	4
Learning objectives were communicated clearly.				
The learning objectives were relevant to my work.				
The session activities helped me meet the learning objectives.				
The activities were engaging and met my needs as an adult learner.				
I plan to use what I learned in this session in my work at my campus.				

1. Considering only this session, what did you find effective or most helpful about this session?

2. Considering only this session, what areas could have been improved to better meet your needs?

Please rate your experience for each of the following professional development experiences using the following scale:

1 = Strongly Disagree 2 = Disagree 3 = Agree 4 = Strongly Agree

Day 3 Morning Session

Session Title: Now That We Know, What do We Do?

	1	2	3	4
Learning objectives were communicated clearly.				
The learning objectives were relevant to my work.				
The session activities helped me meet the learning objectives.				
The activities were engaging and met my needs as an adult learner.				
I plan to use what I learned in this session in my work at my campus.				

1. Considering only this session, what did you find effective or most helpful about this session?

2. Considering only this session, what areas could have been improved to better meet your needs?

Please rate your experience for each of the following professional development experiences using the following scale:

1 = Strongly Disagree 2 = Disagree 3 = Agree 4 = Strongly Agree

Day 3 Afternoon Session:

Session Title: Strategies for Hiring, Assigning and Developing Teachers to Maximize Student Learning

	1	2	3	4
Learning objectives were communicated clearly.				
The learning objectives were relevant to my work.				
The session activities helped me meet the learning objectives.				
The activities were engaging and met my needs as an adult learner.				
I plan to use what I learned in this session in my work at my campus.				

1. Considering only this session, what did you find effective or most helpful about this session?

2. Considering only this session, what areas could have been improved to better meet your needs?

Appendix C: Interview Protocol

1. Describe the instructional setting and structures that are used in your building.
What structures, such as self-contained classrooms, departmentalized teams, do you use? How are your teachers assigned so that all the core subjects are taught?
2. Suppose you had an opening for a fifth-grade teacher. What factors would you consider most important when making the decision on whom to place in that classroom?
3. Now consider you have an opening for a first-grade teacher. What might be the same and what might be different about the factors you consider important?
4. What are the three or more factors you perceive to be important when making teaching assignments?
5. Describe the ideal candidate to fill an opening for a mathematics teacher on your instructional team.
6. What specific questions might you ask potential teachers that influence your placement decisions?
7. How do you determine the level of mathematical content knowledge possessed by those you are placing on your instructional team?
8. What factors do you consider when determining the teaching expertise of those whom you assign to teach mathematics?
9. What effect, if any, do you believe teacher salary constraints factor into the quality of candidates who apply for a teaching position in your school?
10. What effect, if any, do you believe that overall budgetary constraints factor into the

- quality of candidates who apply for a teaching position at your school?
11. What other factors or constraints do you believe influence the quality of the candidates who apply for a teaching position at your school?
 12. What subjects and ages did you teach before becoming an elementary principal?
 13. Tell me about your college education. Where did you go to school? What degrees do you hold? What were your major and minor academic areas? What was your most advanced college course in mathematics? How about quantitative science courses?
 14. What fields, other than education, do you have experience with?
 15. What formal or information education or training have you had in human resource management? How has this training experiences supported your work with regard to your hiring practices in your current role?
 16. What other factors do you believe to be important that you may not have already shared?