Teacher Perceptions of the Selection and Implementation of a New Mathematics Program

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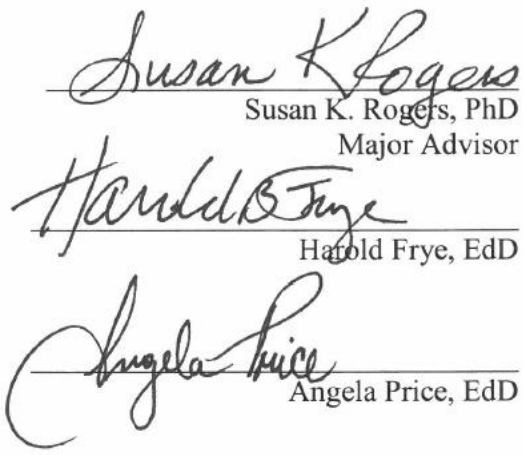

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Abstract

The focus of this study was to investigate teacher perceptions of the resource adoption process and implementation of a new mathematics resource. The researcher investigated how teachers perceived the adoption process, how satisfied teachers were with the implementation of the new mathematics resource, how teachers use the new program resources, if there is a relationship between teachers' perceptions that they had a voice in the selection of the new mathematics program and their use of the components of the mathematics resource, if teachers perceived they received quality professional development for the new mathematics program, to what extent each of the components of the new mathematics program was covered during the professional development, and to what extent teachers utilized the instructional strategies associated with each of the standards for mathematical practice. The findings from this study indicated that teachers did not feel they had a voice in the selection process, and they were using some components of the mathematics resource, but others were not being used. Professional development for the resource was found to cover parts of the new resource and not others. It was also determined that there is a relationship between whether teachers felt they had a voice in the selection process and their use of some of the components of the mathematics resource but not others. The implication of the results is that teachers should be involved and feel they are part of the resource adoption processes. This study should be expanded to include other content areas and a variety of school district sizes and demographics.

Dedication

This work is dedicated to my family: to my son, my buddy, Michael, who has taught me to speak my truth and know myself; to my husband, Adam, who always understands and encourages me; to my parents, Jerry and Robin, who have always taught me there are no limits and to strive for what I want, whatever that may be; to my bonus parents, Mark and Connie, who have taught me to continue when the path is unknown; to my large extended family, including my grandparents, Rick and Joan, who created the circus that has loved me and raised me. Last, this work is dedicated to the Jewell that has guided my journey.

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Chapter 1

Introduction

Districts must decide which resources to utilize to best fit the needs of their student population. This decision cannot be made lightly. There are various processes districts use to ensure the selected resource addresses the curriculum, standards, and student population's needs. According to Chingos and Whitehurst (2012), "The evidence suggests that choice of instructional materials can have an impact as large as or larger than the impact of teacher quality" (p. 3). Therefore, when districts decide to adopt a new resource, the district must invest time and research into ensuring the resource is best for the district. Chingos and Whitehurst also stated that adopting a new resource is a way for districts to boost student learning and can require less money and time than other items that might help student achievement.

School districts use many different processes to adopt a new resource; therefore, district administration must ensure the process for adoption the district is using is a best practice and include the many needs of the teachers and students. According to Briars (2014), the former president of the National Council of Teachers of Mathematics (NCTM), resource adoption has become a hot topic because states have recently changed standards. Therefore districts must look at the standards and curriculums to ensure the resources they are using will address the standards which need to be mastered (Byers, 2014).

According to the Common Core State Standards Initiative (2022a), in 2009, a group of states started developing new standards for each grade level that all the states would hopefully adopt. In 2010, the standards were developed by groups of teachers,

administrators, and other educational professionals and were finalized and released. From this point, each state began reviewing and adopting the standards. Since then, some states have stayed with these standards, and others have not. Some states have used these standards for guidance to create their standards. Byers (2014) concluded that one thing is clear: With all these states changing the standards for learning, there has been a need for new resources that address these standards across the board. Thus, creating the need for resources that address the standards is a hot topic in education (Byers, 2014).

Byers (2014) indicated that district administrators had used various processes to select instructional materials. Districts have taken the time to select the curriculum that best serves their students. When districts have determined the curriculum they will use, they will have to closely look at the resources used to teach that curriculum and ensure it is the best choice for the student population they serve. Therefore, the process of selecting that resource is vital (Byers, 2014).

After a resource is selected, the challenge becomes teaching the curriculum and implementing the new curriculum resource. Resource implementation includes ensuring teachers are provided with professional development to use the resource effectively. Jonyo and Jonyo (2019) stated, “There can be no development without the development of the teacher.” (p. 53). “For education to meet both the rapid requirement of the demand for new curriculum and methods of teaching, the teachers have to be empowered through training” (Jonyo & Jonyo, 2019, p. 53). They concluded that meaningful professional development must be provided to the teachers and staff using these new resources to address the curriculum. Thus, the implementation process is equally important when looking at new curriculum resources. Therefore, not just the process of adoption must be

examined but also the implementation process. In one study, not just the selection process was examined but also the implementation process and the importance of that process in the success of the resource to meet the district's needs and accelerate student achievement (Opfer et al., 2017). There is still limited research on the curriculum resource selection process, professional development related to resource implementation, and factors affecting the implementation.

Before 2010, Missouri used the Missouri Grade Level Expectations (GLEs) that specified what standards need mastery for each grade level. Then in 2010, the Missouri School Board elected to replace those standards with Common Core Standards. According to the Missouri Department of Elementary and Secondary Education (MO DESE) memo, the new standards would begin with a phased start beginning in the 2014 school year. However, shortly after the Common Core standards were adopted, many parents voiced concerns about them. Therefore in 2016, the state school board voted to develop Missouri Learning Standards (MLS) (Ballentine, 2016). After this vote, according to the MO DESE website, the MLS were designed and implemented in 2019.

Background

Since 2010, districts in Missouri have faced several changes to standards for learning; therefore, districts have had to make many curriculum changes during this time. One issue with curriculum changes is that teachers and leaders must determine what resources truly address their curriculum and the student population's needs. Other groups within the district have a vested interest in this resource selection, such as parents and patrons of the district. Therefore, there needs to be a process for districts to look at these

resources carefully and evaluate them to see how they meet the district's needs and that curriculum standards are mastered.

Missouri districts had to look at their curriculums and adapt to all these standard changes throughout this period. In recent years, districts have found new resources that better address the latest standards and curriculum that students must master. Therefore, districts have used different processes to decide what resources work best for their student populations.

This study was completed in a small urban Missouri school district. The district consisted of four elementary schools, one high school, one middle school, one alternative school, and an early childhood center. The district comprised 2,500 students, of which 62.2% were Black, 8.4% were Multi-Race, 8.4% were Hispanic, and 19.3% were White. During the 2020–2021 school year, 15% of the district population was enrolled in special education, and 75% qualified for free or reduced lunch. This district is unique because it is an urban district that receives 75% of its revenue from local funds (MO DESE, 2020).

In the urban district, much work was done on the standards and curriculum before adopting the new MLS standards. The mathematics standards in Missouri changed in 2014 and 2019. Therefore, work with the standards and curriculum seemed to be constant. Kindergarten through fifth-grade teachers had some resources to address these standards, but the teachers in this urban district had different resources at different buildings. While there was some cross-grade level district collaboration, each teacher found resources independently to address the common standards (former director of curriculum, personal communication, May 17, 2019). The district had a change in leadership, and new leadership found that each elementary having its own curriculum

resources created inequity for students depending on the elementary school in which they were enrolled. Therefore, the decision was made to adopt a curriculum and implement a new resource with fidelity so that all Kindergarten through fifth-grade teachers and students can access the needed resources. A shared resource would help ensure equity among the students and allow for more collaboration between teachers. (executive director of curriculum and instruction, personal communication, May 24, 2021).

With this decision made, a curriculum based on the new standards was developed by 2019, and it was decided that a new resource would be selected. The district administrators selected one to two teachers who knew the mathematics curriculum for each grade well. Support teachers, such as English as a Second Language teachers and special education teachers, were also selected to ensure that all resource components were examined and the needs of all student populations were met (executive director of curriculum and instruction, personal communication, May 24, 2021).

This selection process created a 25-teacher committee for the new resource adoption. This committee met on multiple days to look at various available resources. The committee narrowed it down to two resources and researched them for six weeks. The resources were also made available to any other teacher in the district who wanted to assess the resources. After six weeks, the committee voted on which resource they thought best aligned with the curriculum (executive director of curriculum and instruction, personal communication, May 24, 2021).

The resource was approved and purchased in the Spring of 2019 and implemented in the Fall of 2020. The resource purchase included professional development for all the Kindergarten through fifth-grade teachers in the district. The purchase included three all-

day professional development days and support as needed for a year. This professional development was extended over two years because of school closures for COVID-19 (executive director of curriculum and instruction, personal communication, May 24, 2021).

Statement of the Problem

In the urban district, many years of work were completed around the curriculum for elementary mathematics. According to the executive director of curriculum and instruction, in 2014 and 2019, the mathematics standards for Missouri changed, causing the district to focus its work on the standards and curriculum. Teachers had some resources to address these standards, but the kindergarten through fifth-grade teachers did not have the same resources from building to building. While there was some cross-grade level district collaboration, each teacher independently found resources to address the common standards. The district changed leadership, and the new leadership initially allowed the building administration to purchase more items at the building level. Allowing each building to purchase resources individually caused the buildings to have even more varying resources, which increased the gap between students' scores from building to building. Therefore, the decision was made to adopt a curriculum resource and ensure that it was implemented with fidelity so that all teachers and students could access the needed resources. A common resource would also help ensure equity among the student and teachers (executive director of curriculum and instruction, personal communication, May 24, 2021).

In Spring 2019, an adoption committee was formed, and a resource for kindergarten through fifth-grades was selected and approved. In 2019, it had been a long

time since the district had gone through the resource selection process because it was a smaller district and individual schools had purchased their resources. Therefore, there was no policy or precedence on what this process should look like for the district. The administration selected the process that was used. It had been a process district administration had used before in other districts where they were employed previously. This process was sped up to try and get the resource approved and purchased by fall 2020. Curriculum leaders needed to know teachers' perceptions of this process and its effect on teacher implementation. (executive director of curriculum and instruction, personal communication, May 24, 2021).

Kindergarten through fifth-grade teachers received professional development for three full days and were individually supported as needed. Leaders needed to know the impact professional development has had on implementation and how the professional development was perceived. This study could help the district determine an implementation process for other content areas as the district begins to add more resources (executive director of curriculum and instruction, personal communication, May 24, 2021).

Purpose of the Study

The first purpose of this study was to examine to what extent teachers perceived that they had a voice in the selection of the new mathematics program. The second purpose of this study was to determine to what extent teachers are satisfied with the implementation of the new mathematics program. The third purpose of this study was to examine to what extent teachers use the new mathematics program resources. The fourth purpose of this study was to examine to what extent there is a relationship between

teachers' perceptions that they had a voice in the selection of a new mathematics program and their use of the components of the new mathematics resource. The fifth purpose of this study was to examine to what extent teachers perceive they received quality professional development for the new mathematics program. The sixth purpose of this study was to examine to what extent each new mathematics program component is covered during professional development. The last purpose of this study was to examine to what extent teachers utilize the instructional strategies associated with each of the standards for mathematical practice.

Significance of the Study

As stated previously, there have been several changes in the standards for Missouri. Therefore, this study could be used locally with the school district to reflect on the process used and see if there are changes to the process that could be made. Leaders in the district are looking to implement more resource adoptions over the coming years to ensure that all resources address the new standards. This researcher examined teachers' implementation and the professional development provided. The study could provide the district with information on how the selected resource is used and if any further professional development needs to be implemented. The results of this study could provide information to other districts and individuals looking for resource adoption and implementation research. Many districts are in the same process of looking for new resources because of the changes in the standards; therefore, the results of this study might provide useful information about the selection and implementation process of a new resource.

Delimitations

According to Theofanidis and Fountouki (2018), delimitations are "concerned with the definitions that the researchers decide to set as the boundaries or limits of their work so that the study's aims and objectives do not become impossible to achieve" (p. 157). Therefore, some of the delimitations of this study include the following:

1. Participants in this study were limited to teachers who were present for the selection process, which took place in the Spring of 2019, and the adoption process, which took place over the 2019-2020 and 2020-2021 school years.
2. Participants in this study were limited to the kindergarten through fifth-grade teachers in the urban school district who teach mathematics.
3. Participants in the study were limited to those who responded to the survey that the executive director of curriculum and instruction administered during spring 2021.

Assumptions

Delin et al. (1994) discussed the idea that assumptions "act as 'implicit premises' for thought and action, that they may be unconscious, or at least unnoticed, and that people can consciously attend to" (p. 115). Delin et al. stated that assumptions are unconscious biases or ideas individuals have when interacting with the world. Researchers need to account for the assumptions that could be present in their research. Therefore, some of the assumptions made in this study could include the following:

1. Teachers who participated in the study understood all questions that were asked of them.
2. Teachers answered the questions honestly.

Research Questions

According to Lunenburg and Irby (2008), research questions help drive or direct the study. The research questions should not have been answered by other research, and they should help to answer an unknown. The following research questions guided this study.

RQ1

To what extent do teachers perceive that they had a voice in the selection of the new mathematics program?

RQ2

To what extent are teachers satisfied with the implementation of the new mathematics program?

RQ3

To what extent do teachers use the new mathematics program resources?

RQ4

To what extent is there a relationship between teachers' perceptions that they had a voice in the selection of the new mathematics program and their use of the components of the mathematics resource?

RQ5

To what extent do teachers perceive they received quality professional development for the new mathematics program?

RQ6

To what extent were each of the components of the new mathematics program covered during the professional development?

RQ7

To what extent are the instructional strategies associated with each of the standards for mathematical practice utilized by teachers?

Definition of Terms

The following is a list of terms that are used in this study. These definitions are provided to help clarify these terms and ensure there is no misunderstanding.

Eureka Math

According to Great Minds (n.d.), Eureka Math is one of the most widely used mathematics resources. The curriculum covered Grades K-12 and was created by educators and the not-for-profit Great Minds to address the common core standards. The curriculum is often referred to also as EngageNY in some resources.

Mathematics Curriculum

A mathematics curriculum is the "plan for the experiences that learners will encounter, as well as the actual experiences they encounter, that are designed to help them reach specified mathematics objectives" (Remillard & Heck, 2014, p. 707).

Math Resource / Program

Pepin and Gueudet (2018) defined "mathematics curriculum resources as all the material resources that are developed and used by teachers and students in their interaction with mathematics in/for teaching and learning, inside and outside the classroom" (p. 2). For this study, resources refer to the materials used to teach the curriculum and address the standards.

Mathematics Standards

"The mathematics standards include content standards and mathematical practice outlining what each student should know and be able to do at the end of each grade. The standards collectively define the skills and knowledge all students need to succeed" (NCTM, n.d., para. 2).

Professional Development

According to Leaning Forward (2022), professional learning and development provide teachers and support personnel with the necessary knowledge and skills to sustain these programs and resources. Therefore, professional development cannot be a one-time task for a teacher but an ongoing learning.

Standards for Mathematical Practice

Common Core State Standards Initiative (2022b) defined the Standards for Mathematical Practice (SMP) as "varieties of expertise that mathematics educators at all levels should seek to develop in their students." These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education (Common Core Standards Initiative, n.d., para. 1). According to Common Core State Standards Initiative, the standards were created with the NCTM process standards of problem-solving, reasoning and proof, communication, representation, and connections, and the strands of mathematical proficiency. The strands of mathematical proficiency were defined by the National Research Council and included the skills of adaptive reasoning, strategic competence, conceptual understanding, procedural fluency, and productive disposition.

Teacher's Voice

For this study, teacher's voice refers to the input teachers had in decision-making. Great Schools Partnership (2013) defined teacher voice as the "values, opinions, beliefs, perspectives, expertise and cultural backgrounds of the teachers working in a school" (para. 1). Great Schools Partnership also added that this includes all who advocate for teachers, including unions and community members.

Organization of the Study

This study consists of five chapters. Chapter 1 included the background, statement of the problem, purpose, significance of the study, delimitations, assumptions, research questions, and definitions of terms. In Chapter 2, the literature relevant to this study is reviewed, including research on the selection process, SMPs, professional development for new resources, and teachers' perceptions of the selection process. Chapter 3 provides the methodology, including research design, selection of participants, measurement, data collection procedures, data analysis and hypothesis testing, and limitations of the study. Chapter 4 provides the descriptive statistics and results of the study. Chapter 5 includes a study summary, findings related to the literature, and conclusions.

Chapter 2

Review of the Literature

This chapter includes a review of the literature about program or textbook adoption. This chapter begins by examining the research on textbook and resource implementation. The second section includes a review of the standards for mathematical practice. The focus of the third section is professional development research and its impact on teacher practice or student learning. In the last section, the research on teacher perceptions of the resource adoption process is examined.

Textbook and Resource Implementation

Duurlak and DuPre (2008) published a study review to assess the impact of implementing a program or resource. They also identified factors affecting the implementation process. Duurlak and DuPre found five meta-analyses and 59 studies assessing the impact of implementation on outcomes. Some of the findings from this review were that if anyone is expecting perfect or near-perfect implementation, it is an unrealistic expectation. It was found that there were usually positive results, with just 60% implementation, and that very few instances occur where anyone obtains greater than 80% implementation. Duurlak and DuPre also concluded that districts with exemplary implementation not only increase the chances of the resource's success but can also lead to much more substantial benefits for the participants. They also found that the organization's capacity is critical to implementation. An organization must have support to add these resources successfully, and the support comes through training, professional development, and technical assistance that outside organizations often provide.

McNaught (2009) completed a two-year study examining the implementation of a mathematics resource in secondary classrooms. McNaught wanted to see to what extent teachers use the resource during lessons and to what extent teachers provide students the opportunities to learn the curriculum embedded in the resource. The participants in this study included 44 teachers and 12 administrators. McNaught found that teachers utilized the resource more than half of the time in the first year, and that declined to less than one-fourth of the time in the second year. Classroom observations also indicated that fidelity decreased in the second year of implementation. Teachers also supplemented materials for standards that were expected to be on the state assessment. McNaught concluded that an implemented resource could not be measured by its impact on learning.

Additionally, McNaught (2009) concluded that there is little research on resource implementation, so judging any curriculum resource with student achievement is not fair. He also stated that teachers' self-reported use of the different resource components often did not align with classroom observations. McNaught noted that classroom observations are important and gave a much clearer picture of how much teachers implement with fidelity. McNaught also found that in school districts where resources were selected with careful consideration for how well the standards were addressed in the resource, they saw a higher level of fidelity with those resource materials.

McNaught et al. (2010) completed a study examining the implementation fidelity with a new mathematics textbook over three years to determine if the teachers were implementing a resource with fidelity. The researchers used textbook-use diaries to gather data. They had 218 textbook-use diaries collected over three years; the diaries included all details from 15 consecutive days of instruction. The study also used 326

classroom observations over the first two years to collect data on implementation fidelity. McNaught et al. found that one factor in if there is variation in teacher implementation of a textbook or resource has to do with the testing requirements of that state. McNaught et al. found that within three years of adopting a resource or textbook, teachers usually supplement as much as one-third of the content with other materials and not the resource. McNaught et al. concluded that more information needs to be gathered on why teachers perceive the need to supplement these resources. Data on what needs are not being met by a resource and why teachers supplement should be gathered.

El-Saleh (2011) performed a study to identify and examine teachers' concerns regarding using a newly adopted textbook. The researcher examined feedback from 147 middle school mathematics teachers in Texas. El-Saleh found that teachers' most significant concerns focused on managing their workload in the early stages of implementing a new resource while learning it. El-Saleh also commented that teachers feel isolated and unsupported regarding new resource materials and would like more support from schools and textbook publishers. This support would also include time with the new resource. Finally, El-Saleh concluded that teachers would also like evidence that the new textbook supports student learning.

Niu-Cooper (2012) conducted a study that used several qualitative approaches to explore how Chinese English textbook adoption took place in four rural schools. This study included teacher interviews. An administrator in charge of the teachers also observed classrooms at least 14 times to gather data on the implementation. Niu-Cooper found that the change agents for new resources often could be education departments, local school boards, school administration, or federal policymakers. Niu-Cooper found

that classroom teachers often felt as if they were worker bees in the process of adopting these resources. The biggest lesson from this research is that long-existing hidden cultures play a crucial role in implementation.

Kang and Everhart (2014) completed a study about the implementation of a digital textbook resource and concerns around the implementation. The study was completed in Florida with questionnaires to 170 school librarians. The researchers identified concerns of school librarians with the adoption of digital resources. Kang and Everhart found that some of the concerns included librarians who have communities with little exposure to digital resources. These communities are then asked to implement digital resources when students previously had no exposure to them. The second concern that Kang and Everhart found was if the students are expected to have access to digital materials, then whose responsibility is it to ensure this is so? If it is a librarian's responsibility, how does that fit into the duties already needed of school librarians?

Nevenglosky et al. (2017) completed a study looking at the barriers to effective resource implementation. Schools often report a lack of curriculum fidelity, especially regarding new resources. Therefore Nevenglosky et al. needed to identify barriers preventing full resource implementation. The researchers interviewed 10 participants, eight were classroom teachers, and two were administrators. The study also consisted of classroom observations and interviews with participants to determine some barriers to resource implementation. Nevenglosky et al. found that teachers often had concerns related to the curriculum and the understanding of the expectations of students for specific curriculum standards. Teachers also reported concerns about personal time and commitments due to a new resource. The third concern of teachers was time management

involving a new resource. The last concern was the requirement that staff and teachers sit down and look at practical ways for idea sharing and collaboration.

Rahman et al. (2018) focused their study on the factors affecting teachers' implementation of a curriculum in secondary schools in Bangladesh. Rahman et al. acknowledged that the teacher's role in curriculum development is crucial. They also discussed that teachers must have a part in the development of the curriculum for teachers to understand why there may be changes or reforms with the resources. Rahman et al. found that a teacher's curriculum needs and how teachers are orientated to the resource must be considered when selecting the resource. Rahman et al. also found that the curriculum needs clarity to ensure that it is explicit about what the teacher is expected to teach and know. The researchers also commented that resource materials and assessments must be aligned with the curriculum, and teachers must know the curriculum to ensure that they see this alignment in the resource. In the second part of the study, Rahman et al. researched how teacher characteristics affect resource implementation. The researchers found that the quality of teachers affected how well the resource was implemented. The last part looked at professional development when implementing a new resource and found that teachers need more professional development around the resources to ensure they are used permanently. Rahman et al. commented that these are all things that need to be considered by school leadership when implementing a new resource.

Standards for Mathematical Practice

In 2010, when the common core standards were released, eight SMPs were also announced and were primarily influenced by the report *Adding It Up* (Common Core State Standards Initiative, 2022b). These standards were not just specific skills that

students were expected to master; they were instead processes that students should master over their mathematical careers in school. Students should use these processes with different skills they learn throughout their K-12 education (Common Core State Standards Initiative, 2022b). The SMPs were a new concept; therefore, there is minimal research on these standards and their impact on learning. There is limited research on how these standards are addressed in resources and textbooks.

In 2013, Graybeal conducted a study with 23 pre-service teachers from Maryland during their student teaching experience. When asked where they saw these SMPs applied in the resource and curriculum, it was apparent that they could not identify when the SMPs were in use. As part of the study, Graybeal (2013) introduced these preservice teachers to an application and did an hour's worth of professional development with the teachers, where they would observe a classroom and mark when they saw each of the SMPs. At the end of this study, Graybeal reported that 77% of preservice teachers reported that the process increased their understanding of the SMPs significantly. After going through this process, the preservice teachers reported that it is now evident where in the curriculum and resources the SMPs are located, and now students are participating in the SMPs more (Graybeal, 2013).

Bostic and Matney (2014) studied teachers' comprehension of the standards and where they are present in their curriculum and resources through a role-playing activity. Forty-six teachers from the Midwest participated in the study, half taught kindergarten through fifth-grade mathematics, and the other half were Grades 5-10 mathematics teachers. Teachers were from urban, suburban, and rural school districts. Teachers were asked to role-play how their curriculum and resources demonstrate the eight SMPs. After

doing so, teachers received professional development with role-playing to increase their understanding of the SMPs (Bostic & Matney, 2014). Teachers were interviewed at the end of the process, and data were collected to assess if there was a better understanding of the SMPs. Bostic and Matney had three conclusions; the first one is that teachers struggle with the idea that the SMPs were written for students to demonstrate these skills. Often teachers want to model these skills for the student, but the standards require the student to model these skills. Secondly, Bostic and Matney concluded that classroom norms impact how well the SMPs can be exhibited and employed in the classroom. Thus, classrooms with more structure allow students to participate in the SMPs more often. Bostic and Matney's third conclusion was that many teachers misunderstood SMP #1. When teachers role-played around SMP #1, even after professional development, they did not engage in activities considered adequate for SMP #1. In these role-playing events, teachers often took students through the steps of an algorithm to solve a mathematics problem instead of engaging in deep problem-solving activities with little adult guidance (Bostic & Matney, 2014).

Olson et al. (2014) performed a study in Nevada considering teachers' initial perceptions of the SMPs and implementation considerations with the curriculum and resources in their classrooms. This study had 23 participants, with 17 of them teaching secondary mathematics. All teachers had at least one year of experience and taught in the same large urban district. Olsen et al. collected survey data about teachers' initial perceptions of the SMPs. Then, after professional development on the SMPs, data was collected on the teachers' understanding of the SMPs and where teachers felt it was implemented in their curriculum and resources. Olson et al. concluded that teachers

understood some of the standards after the professional development, but standards 1, 4, 5, and 7 had responses that indicated teachers did not understand those standards. The second conclusion was that teachers did not understand that the standards are student-orientated versus teacher-orientated. For example, teachers gave examples of implementation in their teaching practices instead of student practices. Teachers need to understand that they have to modify the practices of the student and help the student learn mathematics to truly master the SMPs (Olson et al., 2014).

Mortimer (2018) studied pre-service teachers at a large midwestern public university to analyze their perceptions of the standards and their relationship with the available resources. For this study, 17 preservice teachers who had already graduated but had not entered the classroom were selected. The preservice teachers had to use the resources and find where in the resource there was an opportunity to use an SMP, which included finding where the authors had planned for students to join in an SMP activity. It also included where an SMP activity could easily be added to enhance a lesson and where SMPs were present in the assessments from their resources. Mortimer found that the teachers did not agree with the authors of their resources on how often they felt the SMPs were represented in the materials or assessments. The resources authors reported that SMPs were being addressed more often than preservice teachers thought the SMPs were being addressed in the resource. The study's second finding was that a discrepancy exists between the authors' and preservice teachers' interpretations of the SMPs. Mortimer found that the resource's authors and the preservice teachers disagreed on the requirements for standards 1, 4, and 5. The third finding was that the pre-service teachers often assigned SMPs to particular tasks or problems on assessments without looking at

the SMP requirements. Mortimer recommended that the SMPs be more explicitly taught in preservice programs.

In 2019, Colen conducted a qualitative study examining elementary school teachers' perceptions of the SMPs. In this study, Colen (2019) interviewed eight Pennsylvania teachers. All teachers were elementary teachers and had been in the classroom for at least 10 years. All teachers had master's degrees in education, and four were serving in roles coaching other teachers. Through an extensive interview process with the eight teachers, Colen concluded that there was much disagreement about what each standard requires. Standards 1, 2, 3, and 7 had consensuses on what those standards demand; however, teachers disagreed on the requirements related to standards 4, 5, and 6. Standard 8 only had two teachers in agreement on what this standard entailed. Colen concluded that experienced teachers dispute the standard's precise requirements; therefore, she recommended that organizations provide professionals with these standards and offer more guidance on the expectations of each standard.

In a 2019 study, Corneille reviewed three textbook resources and how the SMPs were present in the different resources. Corneille (2019) looked at word problems and if the SMPs were present in word problems. Resource publishers often label word problems as addressing certain SMPs, and these word problems were compared to the individual evaluation criteria for each standard. Corneille found that the textbooks did not align with the standards as much as the publishers claimed that it does. Corneille found that the only difference between problems labeled as addressing the SMPs and problems labeled as not addressing the SMPs was the language of the problem and that students were still asked to complete the same task. Corneille concluded that relying on the publishers'

descriptions is not recommended. The SMPs require a deeper level of rigor, and while many publishers claim that a question may address a standard, that is not always valid when those standards are broken down and examined using the individual criteria for each standard.

Max and Welder (2020) studied professors of preservice teachers to determine whether they were providing opportunities for preservice teachers to understand the complexity of the SMPs. Max and Welder included 120 college professors in this study. The professors had various backgrounds and had taught in different districts and at both elementary and secondary levels. Participants were interviewed, and resources and curricula for these courses were analyzed. Max and Welder found that one SMP was practiced more than any other one, and therefore, professors should try to incorporate the other standards into the curriculum. The second piece that was found and discussed was that professors were often very intentional about planning these opportunities. However, often the preservice teachers did not get the intentionality of the activities nor gain the understanding that the instructors had as an objective. The recommendation was made for professors to be more explicit about the instructional design of their lessons and how the SMPs are brought forth in lesson design (Max & Welder, 2020).

Edward (2021) also researched what support teachers receive while implementing the SMPs. School districts often advise teachers to implement the resources with fidelity to ensure that the SMPs are being implemented, but teachers often feel that even if they are implemented with fidelity, the SMPs are still not mastered to the level they should be. Edward also noted a gap in the literature regarding what teachers perceive as mastery of the individual SMPs. He, therefore, collected data from 12 middle school teachers who

had districts that were using the SMPs to address this question. His finding was that even though teachers felt that the SMPs were good for student learning, there was an implementation gap. Edward stated that many teachers admit that when planning lessons, they do not explicitly plan for the SMPs. He also concluded that certain SMPs come more naturally when working with mathematics, and teachers are more likely to use those standards. Most teachers also reported that they did not have professional development on the SMPs, and there was no district or school expectation to have them in lesson plans. Edwards made four recommendations from his research. The first recommendation is that there needs to be more research on how the SMPs are being used in the schools, which would provide more information as to why this implementation gap exists. He also stated that his study looked at the teachers' perspectives and that looking at coaches' and administrators' perspectives might provide more insight. The third recommendation was to examine the preservice teacher programs more closely to ensure that SMPs and the understanding of each standard is a concept that is being taught in the undergraduate programs. The last recommendation was to look at the successful teachers and see how they implement the SMPs into their classrooms with the resources provided (Edward, 2021).

Professional Development When Implementing a New Resource

Archie et al. (2022) commented in their study that little research had been done on professional development's effects on implementing a resource or strategy. Additionally, little research exists on instructors' use of resources after professional development is provided. This section includes the research on implementing or using a new resource or strategy.

Birman et al. (2000) studied professional development and its effectiveness in changing teachers' behaviors in the long term. At that time, Birman et al. noted that most professional development research was anecdotal. They summarized a research-based study conducted nationally with 1,000 participants through the analysis of survey data. They found that multiple factors make up good professional development, but overall, one must increase a teacher's knowledge and skills to be effective. They also mentioned that teachers who went through professional development with teachers who taught like content found the professional development to be more meaningful to classroom practices. They concluded that this caused teachers to gain more skills during professional development (Birman et al., 2000).

Barlow et al. (2014) studied the impact of modeling instruction during professional development on instructional practices and how they took place in the classroom. Nine instructors were selected from the same school district in Arizona. Teachers did teach different content areas. Observational checklists, interview protocols, and the Reformed Teaching Observation Protocol were used to collect data in this study. Each teacher participated in a two-week summer institute on modeling instruction, and data was collected in September of that year. Barlow et al. (2014) found that all participants demonstrated improvement in their content knowledge, but the amount of improvement in their instructional practices varied substantially by the participant. After the professional development, two teachers showed no impact on their teaching practices in the classroom, while four participants had a medium impact on their practices, and three teachers had a high level of impact on their classroom practices. The authors conclude that there is still little known about how or when professional development

impacts teacher instructional practices, nor do they understand what factors affect the fidelity of implementation (Barlow et al., 2014). Therefore, they did conclude that those designing professional development need to talk to participants and be sure they are meeting their needs, making strategies explicit within the professional development, and ensuring they are finding ways the strategy can be implemented within the current scope and sequence of the curriculum (Barlow et al., 2014)

Lin et al. (2015) conducted a study to investigate the connection between teacher professional development programs and student learning. This study consisted of two English teachers in China and 69 of their seventh-grade students. The study took place over two years and involved students who had learned English as their second language. However, all students had English classes since second grade. Over the first-year, teachers participated in a reader's theater training program, which they implemented in year two. Lin et al. wanted to see if there would be a change in English reading fluency scores because of the reader's theater professional development. Lin et al. found that professional development increased teachers' content knowledge on reading fluency. When the fluency scores were examined, it did show that students made some progress with implementing reader's theater. Lin et al. found some barriers to implementing the reader's theater program, the biggest of which was a lack of time. A small amount of time to implement would affect student fluency scores. A conclusion can be made that it would be hard to determine the connection to student learning without knowing how much the program was implemented (Lin et al., 2015).

In a quantitative study, DeNome (2015) examined professional development's effects on student achievement. The study included 500 students in Grades 3-5. DeNome

reviewed the student data from before teachers received the professional development to get baseline scores and then collected data again after the professional development to see if there was an impact on student achievement. All data collected were student data in the form of state assessments, quarterly district assessments, i-Ready assessments, and DRA2+ assessments. DeNome's results were mixed. In mathematics, all students' scores showed a statistical difference, but in reading, there was only a statistical difference in the district and state scores. The i-Ready and DRA2+ scores did not show a statistical difference. DeNome concluded that those providing professional development must ensure that teachers understand the connections between professional development, how students respond and use those strategies presented in professional development, and what the student still needs to learn. DeNome purported that despite some of the mixed results, the study's results indicated that professional development did impact student achievement, and multiple data points need to be analyzed before a conclusion can be made (DeNome, 2015).

Novozhenina and López Pinzón (2018) looked at the effects of professional development with 35 in-service teachers in Columbia. The professional development offered was a set of topics based on the teacher's needs. Novozhenina and López Pinzón used a class observation journal, teacher survey, student survey, and document analysis to determine the impact of the professional development. The researcher found that teachers reported learning from professional development. Comments were made by the teachers about the new things that were learned. The reflections of the teachers showed some improvement in teaching practices as a result of the professional development. Teachers became aware that they needed more information about some of the topics. The third

conclusion was related to the application of new knowledge. Novozhenina and López Pinzón found that some teachers started to implement some of the strategies in the classroom; however, it was just a start, and often teachers understood the theory but were not quite sure how to put that into practice. None of the strategies were implemented fully, but rather just pieces of a strategy. Some participants also reported that they learned nothing from the professional development offered and already had knowledge of the topics. The first conclusion of the study was that while professional development impacts teachers, the impact is more on theory than on practice (Novozhenina & López Pinzón, 2018). The second conclusion was that when an institute plans for professional development, they need to consider the voices of the teachers. The last conclusion was that when designing professional development, institutes need to hear from administrators and determine the institution's needs (Novozhenina & López Pinzón, 2018).

McGee and Nutakki (2017) completed a study in Chicago public schools to examine how professional development impacted the classroom in an urban district, as reported by the teachers and the students. The professional development related to science methods with the new Next Generation Science Standards (NGSS) took place over three years. Student data were collected yearly, and teacher data were collected once at the end of the three years. McGee and Nutakki concluded that teachers who participated in the program increased their self-reported use of some of these strategies. Students also reported teachers using these strategies more often, and there was a significant difference in the teacher's use of these strategies. The last finding was that other teachers often sought out teachers who had participated in and completed the

program. Students reported that those teachers who sought out the trained teachers also used the strategies more often. Therefore, it was also concluded that using the best practices when providing professional development does create a change in classroom practices (McGee & Nutakki, 2017).

Hammond and Moore (2018) studied the impact of professional development on teacher practices. The participants in this study were all the teachers employed in one primary school in Australia. These teachers spent 10 hours learning about an Explicit Instruction model to be implemented in the school. Teachers were also coached in the classroom on improving instruction after this initial professional development. Teachers were assessed using an observation checklist to see if they used the strategies. Hammond and Moore found that teachers' practices did not change much from the initial professional development but rather from the individual coaching that met the teacher's needs. Hammond and Moore also concluded that because teachers are engaging children with effective strategies, there would be an effect on student achievement (Hammond & Moore, 2018).

In 2019, Warner et al. researched the impact of a multiple-year large-scale professional development program on student achievement scores in science and math. The study consisted of 694 mathematics and 976 science teachers in Texas; all participated in a program with a minimum of 100 hours of high-quality content-focused professional development. Warner et al. (2019) examined the student scores of teachers who participated in the professional development to see if they would outperform teachers who did not have professional development training. Warner et al. found no effects on the achievement of students of the teachers who participated in the professional

development as opposed to those of the teachers who had not participated in the professional development. Therefore, this professional development did not impact the student scores. Warner et al. ran eight separate analyses on the data, one for each grade level, and still found no effect size for student achievement. Warner et al. concluded that a clear indication of what impacts student achievement does not exist. They felt the professional development targeted teachers and not students; therefore, measuring student achievement to validate teacher professional development's impact might not be valid (Warner et al., 2019).

Melesse and Gulie (2019) studied the impact professional development has on educational quality in Ethiopia. This study was done in a region of Ethiopia with a total of 22 primary schools; however, only eight were used in the sample, consisting of 116 teachers. The quality of education in Ethiopia has been a serious concern. National assessment results have indicated that students were not mastering the needed skills. The local education office implemented a professional development program to improve teacher performance. All teachers had been involved with this program, but many teachers feel it still could not significantly improve student achievement and teachers' professional competence. Melesse and Gulie found that professional development impacted teacher behaviors regarding teachers' access to new ideas, teachers' state of sharing experiences, and teachers' professional interactions. However, no other impact was found. The results of the data analysis were mixed. The interviews also let Melesse and Gulie know that implementation varied in each school. The recommendation was made that administration must pay attention to other parts of the professional

development to build a genuinely collaborative system at the schools (Melesse & Gulie, 2019).

Bernard and Dudek-Różycki (2020) studied the impact professional development had on teachers' practices. They noted that while there is much research on professional development, it is limited when looking at its impact on classroom practices. The participants in Bernard and Dudek-Różycki's study were Polish science teachers who participated in a SAILS project; two groups of teachers participated in the training in 2014 and 2015, with the entire group comprising of 106 participants. Bernard and Dudek-Różycki concluded that there was a statistical difference in the teachers' performance before and after the training. Extended support was also offered after the training, and data was collected again. Bernard and Dudek-Różycki saw an incline in the implementation of their strategy. However, they noted in their findings that the statistical difference was more significant when looking at teacher behaviors versus student behaviors. Therefore, professional development with these teachers would need to examine student activities more thoroughly to help with the teachers' understanding of student activities (Bernard & Dudek-Różycki, 2020).

Conklin et al. (2020) studied the impact of professional development on teacher content evaluation scores. This study was conducted with a case study approach and involved classroom observations, evaluation scores, and interviews. Conklin et al. collected survey data from the participants before and after professional development and then examined student scores, conducted interviews, and made classroom observations. Conklin et al. found a significant difference in classroom practices; however, they looked at the teacher evaluations of the content and did not see a significant difference. The

recommendation was made that more research would need to be done on the correlation between professional development designs and the teachers' evaluation scores on the content presented. Conklin et al. (2020) noted that many variables could impact evaluation scores; thus, more research needs to be conducted.

Qablan (2021) conducted a study in Jordan, examining 20 science teachers who participated in a weeklong professional development on implementing STEM. These teachers were administered a pre-test before the implementation and a post-test once they were back instructing for one month. All participants reported that after a month of implementing some of the programs, they had challenges assessing if they were to continue the STEM program (Qablan, 2021). While the results of this study showed implementation after a month, it is insightful how teachers need support during implementation (Qablan, 2021).

Sims et al. (2021) conducted a meta-analysis of what constitutes good professional development. These researchers looked at many aspects of professional development, one of which was if professional development led to increased student achievement. Sims et al. pulled all studies they could find with any positive student achievement effect size from 2003 and newer, which was 26 in total. Then, they created an average effect size from all the previous studies. Sims et al. concluded that professional development tends to have a small positive impact on student achievement. While Sims et al.'s conclusion was in contrast to a few studies, it supported most of the studies.

Sodiya and Hajiyeva (2022) conducted a mixed-methods study to determine the impact of professional development on teachers. The researchers provided teachers with

professional development on formative assessment and its use. This study had a small sample size of nine participants from one school in Azerbaijan. The data included pre-data, post-data, and teacher reflection. The professional development lasted two days. Sodiya and Hajiyeva found that the data did show a statistical difference in teachers' scores on a post-assessment. The teacher reflections were not completed until a month after the initial professional development. Sodiya and Hajiyeva found, through the analysis of the teachers' reflections, that professional development was relevant and valuable to the teachers, and teachers reported using formative assessments in new ways to guide instruction (Sodiya & Hajiyeva, 2022).

Archie et al. (2022) studied how well teachers retain and use strategies from professional development. This study started with 700 participants nationally. All of them attended a multiple-day workshop on mathematics strategies. Data were collected from the participants before and after the professional development. Then 18 months later, data were collected again from the participants to see how the mathematics strategies were implemented long-term. Only 60% of the 700 participants were located, creating 361 participants for the entire study. Archie et al. first studied attitude, knowledge, and skill toward the new strategy. They found that when measuring knowledge, there was a large effect size between the pre- and post-test; however, nothing changed between the post-test and 18-month test. When measuring attitude, a negative effect was found between the pre to the post-data, and nothing changed between the post-test and 18-month test. Last, the skill had a large effect size from pre and post and showed an increase in the 18-month survey. Archie et al. concluded that the professional development affected all parts of the teacher's behaviors; however, teachers needed different amounts of time to develop

skills. The second question asked about how professional development affects classroom practices. Archie et al. (2022) concluded that there was a strong positive effect between pre- and post-scores; therefore, the professional development positively affected classroom practices. Archie et al. concluded that the attitude to implement can have an effect temporarily but does not make a difference in long-term implementation. Teachers need to have gained skills and knowledge of the strategy for the long-term implementation to occur (Archie et al., 2022).

Research on Teacher Perceptions of the Resource Adoption Process

According to Oloruntegbe (2011), little research is available that looks specifically at teachers' perceptions of the resource or textbook adoption process. States, school districts, and schools have instructors implement standards or curricula with textbooks and resources and rarely follow up on teachers' perceptions of these components and processes. This topic needs more research as we continue to look at the resource adoption process.

In 1973, Hanson conducted a mixed-methods study that included 192 school districts in Oregon. His study consisted of 833 participants in the curriculum resource selection process. Hanson found that the particular criterion used for the selection process held more weight with individuals who helped make the selection. The criterion that held the most significant weight was content and if skills in the resource were logically sequenced through the scope and sequence. When deciding, secondary teachers also examined if the resource provided enough information for students. Hanson also examined the data from elementary and secondary teachers' points of view and commented on some significant differences in the ratings of these two groups. However,

both groups rated teachers' ability to examine potential resources as one of the most significant factors in their decision-making. Hanson also uncovered that districts with smaller populations had 40% or less of the decision-makers trained to critically examine the resources in the textbook selection process. This number was substantially better in the larger districts. He also found that larger districts often had teachers rate the selection process much higher than smaller districts.

Powell and Rich (1986) conducted a qualitative study examining the textbook selection process in two school districts. One was a rural district with a population of 3,000, while the other was a consolidated school district with a diverse population of 11,500 students. Powell and Rich's goal during this study was to understand better the group and individuals who participated in the textbook decision-making process. Powell and Rich recognized seven factors that persuaded the decision-making in the resource selection process. The first factor they determined made an impact was the textbook publishers. Publishers often provide incentives to individuals in a district that help make their decisions, which is a factor in the decision process. The second factor Powell and Rich discussed was the districts' procedures in the process. Procedures include the timeline the district allows decision-makers to decide and the tools used to help the decision-makers make the best selection. The next factor is what Powell and Rich describe as pedagogy. The two districts held different mindsets with the previously used resources and the cultures built in the different districts. These mindsets were something that Powell and Rich also found to be a factor in what resources were selected by decision-makers.

A few decision-makers were also allowed to pilot some materials, and decision-makers seemed to favor the resources they were allowed to pilot. Powell and Rich (1986) described factor five as politics and personalities. More esteemed teachers were remarkably able to influence their peers and their decisions. Politics and personalities would also include the personalities and relationships that the sales representatives maintained with district decision-makers. The sixth factor is the materials and their appearance. Powell and Rich found that the first impression decision-makers made about a resource often impacted the final decision. The last factor they identified as affecting the decisions made was the public image of the resource. If the resource had a positive reputation, it would have had a good impact on the decision made, and if the resource had a negative image, it would hurt the decision made about that resource.

In 1987, Al-Moh'd conducted a study with 283 teachers and 15 principals. Al-Moh'd's goal was to determine influential factors important in selecting a resource for public schools in the United States. Al-Moh'd found that resource appearance, organization, illustrations, vocabulary, and supplemental resources were the most critical factors that affected the selection process. He also found that differentiated strategies for student needs, textbooks being interesting to students, and providing specific basic skills were also essential but just slightly less than the factors previously mentioned. Items found to be least significant included the answer keys being included with the resource, time estimates for students to complete the resource, and the resource being appropriate for the political and social climate. He also looked at many practices that public schools used during this process. Al-Moh'd found that most districts had a written process for the textbook or resource selection and adoption. Districts also have a written review process

to assess resources and textbooks, including potential resources and resources already in use. Al-Moh'd found that most districts do not provide professional development for teachers making the selection, and there are few procedures to ensure equity of minorities on the selection committees. These are suggestions that Al-Moh'd stated districts should consider when examining the resource adoption process.

In 1990, Ball conducted a study to determine elementary teachers' perceptions in Alabama school districts. Ball (1990) looked at the importance of the standards and criteria used by the state textbook committee to adopt new textbooks and teachers' perceptions of the process used for textbook adoption. Ball ended the study with two conclusions. The first was that teachers agreed that state standards and criteria must be in place to evaluate textbooks when adopted. The second conclusion was that teachers perceived that the textbook's main tier one materials should be accurate, logical, and clear and that the resource's supplemental materials do not have to be as strong.

Welsh (1993) also studied policies, procedures, and practices that some districts adopted when selecting a Language Arts textbook. Welsh examined 53 school districts in 10 different states and divided them into groups depending on whether the textbook adoption created a public challenge. Welsh found many differences in how school districts proceed with textbook adoption and selections, regardless of whether the adoption is publicly challenged. Welsh recommended that districts examine other districts' policies, procedures, and practices to ensure that what they are doing is best practice and that future studies with larger populations of districts should be conducted to see if the findings hold true.

In 2001, Kalder studied the adoption process in New York state districts while they were adopting a mathematics resource. Kalder (2001) compared and contrasted the policies and procedures of the district adoption processes. Kalder found that districts did form a committee and that the superintendent of these districts also reached out to other area districts to get information on the resources and textbooks utilized in those districts. Kalder concluded that while a committee was formed and made recommendations, the committee ultimately did not have a voice, and the upper administration made the decision. In one district, the committee recommendation was not considered when the decision was made. In the other district, the upper administration continued to argue with the committee until they eventually conceded to agree with the upper administration. Therefore, Kalder concluded that while there is a committee and teacher input appears to be present, that is not always perceived as the case.

Bartiromo and Etkina (2009) studied New Jersey teachers' perceptions of student achievement while implementing new resources. The purpose of Bartiromo and Etkina's study was to determine the degree to which the teachers implemented the new resource and what factors determined the degree of implementation. Bartiromo and Etkina determined that no one teacher implemented every component of the resource, but all teachers implemented varying components of the resource. The researchers concluded that the teachers saw the resource as a tool to add to their teacher toolbox but did not have enough confidence in the resource to implement it fully (Bartiromo & Etkina, 2009).

Carreker et al. (2010) completed a study in Texas in an effort to decrease the initial student referral rates for special education services. This study was conducted in an elementary school by evaluating the data from observations and interviews. The study

included examining teachers' instructional tools from the professional development and coaching sessions provided with a new resource. These were closely assessed to determine if teachers perceived these tools as relevant. Carreker et al. then investigated how the teachers utilized these tools in their classrooms and if the tools met the needs of students. Carreker et al. concluded that teachers implemented a limited number of strategies from professional development and coaching sessions, and teachers' perceptions of the strategies were that they did not always pertain to their classrooms and teachers, therefore, did not implement them (Carreker et al., 2010). "Generally, greater teacher knowledge and identification of appropriate activities were related to the number of hours of professional development completed" (Carreker et al., 2010, p. 148).

Ainsworth et al. (2012) examined first-grade teachers' perceptions during the implementation of a reading curriculum. Ainsworth et al. analyzed teachers' perceptions while implementing an English language Arts curriculum in first-grade classrooms. The school district in which the study was conducted required implementing the curriculum within all first-grade classrooms. Data were collected through observations and interviews to determine the teachers' perceptions. Ainsworth et al. concluded that the teachers determined that the resource allowed them to redirect their focus from isolated skills. However, the conclusion was that teachers could not focus on creative and authentic lessons while teaching mandated resources (Ainsworth et al., 2012).

In 2021, Lee conducted a study looking at resource adoption in a Kansas school district. A new mathematics and English language arts resource needed to be adopted. Therefore, the study looked at teacher perceptions of the adoption process. Lee (2021) found that teachers reported they had a voice in the district's adoption process. The

teacher perceived that the piloting program was done fairly and with an appropriate amount of time. Lee also commented that a limited amount of research on teacher perceptions of the adoption process exists. The studies that have been conducted show positive findings when teachers have a voice in the process; therefore, district administrators should ensure that teachers have this role in the process (Lee, 2021).

Summary

The topics presented in this chapter were textbook and resource implementation, Standards for Mathematical Practice, professional development when implementing a new resource, and research on teacher perceptions of the resource adoption process. This chapter provided the reader with a summary of these studies and parts which can be applied to the analysis of this study. Chapter 3 contains an explanation of the research methods used in this study.

Chapter 3

Methods

The first purpose of this study was to determine the extent to which teachers perceive that they had a voice in the selection of the new mathematics program. The second purpose of this study was to determine the extent that teachers are satisfied with the implementation of the new mathematics program. The third purpose of this study was to examine the extent teachers use the new mathematics program resources. The fourth purpose of this study was to examine to what extent there is a relationship between teachers' perceptions that they had a voice in the selection of a new mathematics program and their use of the components of mathematics resource. The fifth purpose of this study was to examine to what extent teachers perceive they received quality professional development for the new mathematics program. The sixth purpose of this study was to examine to what extent each new mathematics program components was covered during professional development. The last purpose of this study was to examine to what extent teachers utilize the instructional strategies associated with each of the standards for mathematical practice. This chapter includes the research design, selection of the participants, measurement, data collection procedures, data analysis and hypothesis testing, and limitations.

Research Design

This study was completed with a quantitative descriptive research design using survey research methods. According to Walston et al. (2017), surveys in educational research are essential for the researcher to obtain quantitative indicators of the characteristics, behaviors, and attitudes of students, teachers, principals, parents, district

administrators, and other specific populations. Therefore, research indicates that studies such as this are essential to understand the behaviors and attitudes of the people working in education. The variables of interest in the study were teachers' perceptions of their voice in the selection process, their satisfaction with the implementation of the new resource, their usage of the components of the new mathematics resource, the quality of the professional development provided for the new mathematics program, the coverage of the components of the new mathematic program during professional development, and the utilization of the instructional strategies associated with each of the standards for mathematical practice.

Selection of Participants

The targeted population in this study was kindergarten through fifth-grade teachers employed by a Missouri school district, District C, during the 2019-2021 school years. All Kindergarten through fifth-grade teachers employed during this time who participated in the implementation process were the participants in this study. Participants were employed as a teacher during both school years.

Measurement

With the help and feedback from other administrators in the district who have been part of the program adoption process, the researcher developed an eight-question survey that used several Likert-type scales to measure teacher responses to the survey questions. Question 1 was used to collect information about the extent that a teacher participated in the selection process. There were six choices, and the participant could select more than one response. The responses to question 1 were (1) member of the selection committee, (2) piloted the program, (3) sat in on the publishers' presentation,

(4) reviewed the materials, (5) provided feedback on the survey, and (6) did not take part in the selection process. This question provided data used in the hypothesis testing for the hypotheses specified for RQ1 (H1–H5) and RQ4 (H23-H37). Question 2 of the survey examined the extent teachers felt they had a voice in this process. Participants could respond with the Likert-type scale of 1 = *not at all*, 2 = *a little extent*, 3 = s*ome extent*, 4 = *a moderate extent*, or 5 = *a large extent*. This question provided data used in the hypothesis testing for research questions RQ1 (H6) and RQ4 (H23-H37). The third question examined the extent to which teachers perceived the other teachers had a voice in the selection of the mathematics resource. Participants could respond with the Likert-type scale of 1 = *not at all*, 2 = *a little extent*, 3 = s*ome extent*, 4 = *a moderate extent*, or 5 = *a large extent*. This survey question was not used in the data analysis. The fourth question determined how satisfied the participants are with the implementation of the new mathematics program. Participants responded using a Likert-type scale that includes 1 = *very dissatisfied*, 2 = *dissatisfied*, 3 = *unsure*, 4 = *satisfied*, and 5 = *very satisfied*. This question provided data used in the hypothesis testing for research question RQ2 (H7). The fifth question on the survey asked the participant to rate how often they use different components of the mathematics resource. Fifteen of the included components were listed, and participants could mark their usage with the Likert-type scale of 1 = *do not use*, 2 = *use quarterly or semesterly*, 3 = *use monthly*, 4 = *use weekly*, and 5 = *use daily*. This question provided data used in the hypothesis testing for research questions RQ3 (H8-H22) and RQ4 (H23-H37). Question 6 of the survey asked the participant to rate the professional development provided. The participant could rate it using the Likert-type scale of 1 = *poor*, 2 = *fair*, 3 = *good*, 4 = *very good*, and 5 = *excellent*. This question

provided data used in the hypothesis testing for research question RQ5 (H38). The seventh survey question asked the participant to what extent the 15 components were covered during the provided professional development. Participants could respond on the Likert-type scale that included 1 = *not covered*, 2 = *slight extent*, 3 = *moderate extent*, 4 = *large extent*, and 5 = *extensively*. This item provided data used in the hypothesis testing for research question RQ6 (H39-H53). The last question on the survey was how often instructional strategies associated with each of the SMPs are utilized in the new mathematics resource. Participants could answer this using the Likert-type scale of 1 = *never*, 2 = *rarely*, 3 = *occasionally*, 4 = *often*, and 5 = *always*. This question provided data used in the hypothesis testing for the research question RQ7 (H54-H61).

According to Lunenburg and Irby (2008), survey validity is the extent to which the survey measures what the researcher implies that it measures. An expert panel of administrators, who had witnessed the resource selection process in School District C, were asked to examine the validity of the survey. The panel consisted of three elementary principals and the executive director of curriculum and instruction. Two of the panelists suggested additional program components to include in the survey, such as Edulastic/Affirm and assessments, which were included in the final survey (see Appendix A). Reliability analysis was not needed for this study because a scale was not constructed from the survey items. The researcher used single-item measurement.

> Most used single-item measures can be divided into two categories: (a) those measuring self-reported facts... and (b) those measuring psychological constructs, e.g., aspects of personality... measuring the former with single items is common practice. However, using a single-item measure for the latter is a “fatal error” in

> research. If the construct being measured is sufficiently narrow or is unambiguous to the respondent, a single item may suffice. (Sackett & Larson, 1990, p. 631)

The individual items used in this research were self-reported facts that were sufficiently narrow and unambiguous. Therefore, reliability was not an issue for this survey instrument's measurement.

Data Collection Procedures

Before the survey was distributed, School District C's superintendent granted permission to conduct the research (see Appendix B). Then a research proposal was sent to the Baker University Instructional Review Board and approved on June 6, 2022 (see Appendix C). The survey was administered by District C with Google Forms during the Spring of 2021. The district's executive director of academic services sent the survey to eligible teachers on May 11, 2021. A reminder email was sent on May 21, 2021, for teachers to respond to the survey. After the survey was closed on May 22, 2021, the executive director of academic services then released the archived data to the researcher after the approval of the Baker IRB.

Data Analysis and Hypothesis Testing

Data were downloaded from Google Forms to an Excel spreadsheet. The data was then imported into IBM SPSS Statistics Faculty Pack 26 for Windows to complete the statistical analysis to address the seven research questions. The research questions, corresponding hypotheses, and statistical analysis used to test the hypotheses are presented below.

RQ1

To what extent do teachers perceive that they had a voice in the selection of the new mathematics program?

H1. Teachers reported they were a member of the selection committee.

H2. Teachers reported they piloted the program.

H3. Teachers reported they sat in on the publisher's presentation.

H4. Teachers reported they reviewed the materials.

H5. Teachers reported they provided feedback on the selection survey.

Five chi-square tests for goodness of fit were conducted to test H1-H5 because the frequency distribution for one categorical variable was analyzed. A frequency table containing the observed and expected frequencies was constructed for the categorical variable, teachers' participation in the resource selection process. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. An effect size, as measured by Cramer's W, is reported when appropriate.

H6. Teachers perceive they had a voice in the selection of a new mathematics program.

A one-sample *t* test was conducted to test H6. The sample mean was compared to a test value of 3. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

RQ2

To what extent are teachers satisfied with the implementation of the new mathematics program?

H7. Teachers reported they were satisfied with the implementation of the new mathematics program.

A one-sample *t* test was conducted to address RQ2. The sample mean was compared to a test value of 3. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

RQ3

To what extent do teachers use the new mathematics program resources?

H8. Teachers reported they use the assessments at least monthly.

A one-sample *t* test was conducted to test H8. The sample mean for the extent teachers reported they use the assessments at least monthly was compared to a test value of 2.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

H9. Teachers reported that they use the Eureka Succeed booklets at least monthly.

A one-sample *t* test was conducted to test H9. The sample mean for the extent teachers reported they use the Eureka Succeed Booklets at least monthly was compared to a test value of 2.5. The one-sample *t* test was chosen for the hypothesis testing because

it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

H10. Teachers reported that they use pacing and preparation guides at least weekly.

A one-sample *t* test was conducted to test H10. The sample mean for the extent teachers reported they use the pacing and preparation guides at least weekly was compared to a test value of 3.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

H11. Teachers reported that they use curriculum maps at least weekly.

A one-sample *t* test was conducted to test H11. The sample mean for the extent teachers reported they use the curriculum maps at least weekly was compared to a test value of 3.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

H12. Teachers reported that they use curriculum overviews at least weekly.

A one-sample *t* test was conducted to test H12. The sample mean for the extent teachers reported they use the curriculum overviews at least weekly was compared to a test value of 3.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is

calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

H13. Teachers reported that they use the standards checklist at least weekly.

A one-sample *t* test was conducted to test H13. The sample mean for the extent teachers reported they use the standards checklist at least weekly was compared to a test value of 3.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

H14. Teachers reported that they use online professional development at least weekly.

A one-sample *t* test was conducted to test H14. The sample mean for the extent teachers reported they use the online professional development at least weekly was compared to a test value of 3.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

H15. Teachers reported that they use sprints at least daily.

A one-sample *t* test was conducted to test H15. The sample mean for the extent teachers reported they use the sprints at least daily was compared to a test value of 4.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated

from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

H16. Teachers reported that they use application problems at least daily.

A one-sample *t* test was conducted to test H16. The sample mean for the extent teachers reported they use the application problems at least daily was compared to a test value of 4.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

H17. Teachers reported that they use problem sets at least daily.

A one-sample *t* test was conducted to test H17. The sample mean for the extent teachers reported they use the problem sets at least daily was compared to a test value of 4.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

H18. Teachers reported that they use homework sets at least daily.

A one-sample *t* test was conducted to test H18. The sample mean for the extent teachers reported they use the homework sets at least daily was compared to a test value of 4.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

H19. Teachers reported that they use templates at least daily.

A one-sample *t* test was conducted to test H19. The sample mean for the extent teachers reported they use templates at least daily was compared to a test value of 4.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

H20. Teachers reported that they use exit slips at least daily.

A one-sample *t* test was conducted to test H20. The sample mean for the extent teachers reported they use the exit slips at least daily was compared to a test value of 4.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

H21. Teachers reported that they use Affirm or Edulastic at least daily.

A one-sample *t* test was conducted to test H21. The sample mean for the extent teachers reported they use Affirm or Edulastic at least daily was compared to a test value of 4.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

H22. Teachers reported that they use manipulative kits at least daily.

A one-sample *t* test was conducted to test H22. The sample mean for the extent teachers reported they use the manipulative kits at least daily was compared to a test value of 4.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d,* is reported.

RQ4

To what extent is there a relationship between teachers' perceptions that they had a voice in the selection of the new mathematics program and their use of the components of the mathematics resource?

H23. There is a relationship between the teachers' perception that they had a voice in the selection and their use of assessments.

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceive they had a voice in the selection of the new mathematics program and the extent teachers reported they used the assessments at least monthly. The statistical significance of the correlation coefficient was examined to test H23. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

H24. There is a relationship between the teachers' perception that they had a voice in the selection and their use of Eureka Succeed booklets.

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent

teachers perceive they had a voice in the selection of the new mathematics program and the extent teachers reported they used the Eureka Succeed booklets at least monthly. The statistical significance of the correlation coefficient was examined to test H24. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

H25. There is a relationship between the teachers' perception that they had a voice in the selection and their use of pacing and preparation guides.

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceive they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the pacing and preparation guides at least weekly. The statistical significance of the correlation coefficient was examined to test H25. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

H26. There is a relationship between the teachers' perception that they had a voice in the selection and their use of curriculum maps

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the curriculum maps at least weekly. The statistical significance of the correlation coefficient was examined to test H26. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

H27. There is a relationship between the teachers' perception that they had a voice in the selection and their use of curriculum overviews

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the curriculum overviews at least weekly. The statistical significance of the correlation coefficient was examined to test H27. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

H28. There is a relationship between the teachers' perception that they had a voice in the selection and their use of the standards checklist

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the standards checklist at least weekly. The statistical significance of the correlation coefficient was examined to test H28. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

H29. There is a relationship between the teachers' perception that they had a voice in the selection and their use of online professional development.

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and

the extent teachers reported they used online professional development at least weekly. The statistical significance of the correlation coefficient was examined to test H29. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

H30. There is a relationship between the teachers' perception that they had a voice in the selection and their use of Sprints.

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the sprints at least daily. The statistical significance of the correlation coefficient was examined to test H30. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

H31. There is a relationship between the teachers' perception that they had a voice in the selection and their use of application problems.

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the application problems at least daily. The statistical significance of the correlation coefficient was examined to test H31. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

H32. There is a relationship between the teachers' perception that they had a voice in the selection and their use of problem sets.

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the problem sets at least daily. The statistical significance of the correlation coefficient was examined to test H32. The level of significance was set at .05. The effect size, as indexed by Cohen's *d*, is reported when appropriate.

H33. There is a relationship between the teachers' perception that they had a voice in the selection and their use of homework sets

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the homework sets at least daily. The statistical significance of the correlation coefficient was examined to test H33. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

H34. There is a relationship between the teachers' perception that they had a voice in the selection and their use of templates

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the templates at least daily. The statistical significance of the correlation coefficient was examined to test H34. The level of

significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

H35. There is a relationship between the teachers' perception that they had a voice in the selection and their use of exit slips

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the exit slips at least daily. The statistical significance of the correlation coefficient was examined to test H35. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

H36. There is a relationship between the teachers' perception that they had a voice in the selection and their use of Affirm or Edulastic.

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used Affirm or Edulastic at least daily. The statistical significance of the correlation coefficient was examined to test H36. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

H37. There is a relationship between the teachers' perception that they had a voice in the selection and their use of manipulative kits.

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the manipulative kits at least daily. The statistical significance of the correlation coefficient was examined to test H37. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

RQ5

To what extent do teachers perceive they received quality professional development for the new mathematics program?

H38. Teachers perceive they received quality professional development for the new mathematics program.

A one-sample *t* tests was conducted to address RQ5. The sample mean was compared to a test value of 3. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

RQ6

To what extent were each of the components of the new mathematics program covered during the professional development?

H39. Teachers perceive that the assessments were covered during professional development.

H40. Teachers perceive that the Eureka Succeed booklets were covered during professional development.

H41. Teachers perceive that the pacing and preparations guides were covered during professional development.

H42. Teachers perceive that the curriculum maps were covered during professional development.

H43. Teachers perceive that the curriculum overviews were covered during professional development.

H44. Teachers perceive that the standards checklist was covered during professional development.

H45. Teachers perceive that the online professional development was covered during professional development.

H46. Teachers perceive that the sprints were covered during professional development.

H47. Teachers perceive that the application problems were covered during professional development.

H48. Teachers perceive that the problem sets were covered during professional development.

H49. Teachers perceive that the homework sets were covered during professional development.

H50. Teachers perceive that the templates were covered during professional development.

H51. Teachers perceive that the exit slips were covered during professional development.

H52. Teachers perceive that Affirm or Edulastic were covered during professional development.

H53. Teachers perceive that the manipulatives kits were covered during professional development.

Fifteen one-sample *t* tests were conducted to address RQ6. For each test, the sample mean was compared to a test value of 3. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

RQ7

To what extent are the instructional strategies associated with each of the standards for mathematical practice utilized by teachers?

H54. Teachers perceive the instructional strategies associated with the standard, make sense of problems and persevere in solving them, which are utilized by teachers.

H55. Teachers perceive the instructional strategies associated with the standard, reason abstractly and quantitatively, are utilized by teachers.

H56. Teachers perceive the instructional strategies associated with the standard, construct viable arguments and critique the reasoning of others, are utilized by teachers.

H57. Teachers perceive the instructional strategies associated with the standard, model with mathematics, are utilized by teachers.

H58. Teachers perceive the instructional strategies associated with the standard, use appropriate tools strategically, are utilized by teachers.

H59. Teachers perceive the instructional strategies associated with the standard, attend to precision, are utilized by teachers.

H60. Teachers perceive the instructional strategies associated with the standard, look for and make use of structure, are utilized by teachers.

H61. Teachers perceive the instructional strategies associated with the standard, look for and express regularity in repeated reasoning, are utilized by teachers.

Eight one-sample *t* tests were conducted to address RQ7. For each test, the sample mean was compared to a test value of 3. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

Limitations

Lunenburg and Irby (2008) wrote that delimitations are "self-imposed boundaries set by the researcher on the purpose and scope of the study" (p. 134). The results of this study were limited because not all the teachers chose to respond to the survey. These responses may also be limited because the director of curriculum and instruction administered the survey, and while it was stated that the participation was anonymous, some might have refrained from answering honestly.

Summary

In Chapter 3, the research methods used in the study were presented. Chapter 3 included the research design, selection of participants, measurement, and data collection procedures. Chapter 3 concluded with the data analysis and hypothesis testing, along with the limitations of the study. Chapter 4 includes the descriptive statistics and the results of the hypothesis testing.

Chapter 4

Results

This chapter includes the results of the study. The data analysis was completed with the archived data that was collected. Descriptive statistics and hypothesis testing are included in this chapter.

Descriptive Statistics

The executive director of academic services sent the survey to 137 staff members who taught kindergarten through fifth grade. Of those educators, 50 responded to the survey, with a response rate of 36.5%. The respondents were all kindergarten through fifth-grade teachers who were present for the selection process in the spring of 2019 and taught during the 2019-2021 school years in School District C.

Hypothesis Testing

This section consists of the data analysis that was completed. Seven research questions were addressed in this study. The data analysis for H1-H5, the hypotheses, and the results of the data analysis follows the first research question. The data analysis and the results follow H6. For RQ2–RQ4, the research question is followed by each hypothesis, data analysis, and results of the data analysis. RQ6 (H39-H53) and RQ7 (H54-H61) are followed by the data analysis for the corresponding hypotheses related to each research question, the hypotheses, and the results of the data analysis.

RQ1

To what extent do teachers perceive that they had a voice in the selection of the new mathematics program?

Five chi-square tests for goodness of fit were conducted to test H1-H5 because the frequency distribution for one categorical variable was analyzed to test each hypothesis. A frequency table containing the observed and expected frequencies was constructed for the categorical variable, teachers' perceptions of their voice in the resource selection process. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. An effect size, as measured by Cramer's *W*, is reported when appropriate.

H1. Teachers reported they were a member of the selection committee.

The results of the chi-square test indicated a statistically significant difference between the observed and expected values, $\chi^2(1) = 29.82$, $p = .000$, Cramer's $W = 0.585$. See Table 1 for the observed and expected frequencies. The observed frequency for being a member of the selection committee ($n = 6$) was lower than the expected frequency ($n = 25.5$). The observed frequency for not being a member of the selection committee ($n = 45$) was higher than the expected frequency ($n = 25.5$). H1 was not supported. More teachers than expected reported that they were not a member of the selection committee. The effect size indicated a large effect.

Table 1

Observed and Expected Frequencies for H1

Response Category	$f_{observed}$	$f_{expected}$
Participated in the selection committee	6	25.5
Did not participate in the selection committee	45	25.5

H2. Teachers reported they piloted the program.

The results of the chi-square test indicated a statistically significant difference between the observed and expected values, $\chi^2(1) = 32.96$, $p = .000$, Cramer's $W = 0.646$. See Table 2 for the observed and expected frequencies. The observed frequency for teachers piloting the program ($n = 5$) was lower than the expected frequency ($n = 25.5$). The observed frequency for teachers not piloting the program ($n = 46$) was higher than the expected frequency ($n = 25.5$). H2 was not supported. More teachers than expected did not report they piloted the program. The effect size indicated a large effect.

Table 2

Observed and Expected Frequencies for H2

Response Category	$f_{observed}$	$f_{expected}$
Piloted the program	5	25.5
Did not pilot the program	46	25.5

H3. Teachers reported they sat in on the publisher's presentation.

The results of the chi-square test indicated a statistically significant difference between the observed and expected values, $\chi^2(1) = 29.82$, $p = .000$, Cramer's $W = 0.585$. See Table 3 for the observed and expected frequencies. The observed frequency for teachers who sat in on the publisher's presentation ($n = 6$) was lower than the expected frequency ($n = 25.5$). The observed frequency for teachers who did not sit in on the publisher's presentation ($n = 45$) was higher than the expected frequency ($n = 25.5$). H3

was not supported. More teachers than expected reported that they did not sit in on the publisher's presentation. The effect size indicated a large effect.

Table 3

Observed and Expected Frequencies for H3

Response Category	$f_{observed}$	$f_{expected}$
Sat in on the publisher's presentation	6	25.5
Did not sit in on the publisher's presentation	45	25.5

H4. Teachers reported they reviewed the materials.

The results of the chi-square test indicated no difference between the observed and expected values, $\chi^2(1) = 2.37$, $p = .123$. See Table 4 for the observed and expected frequencies. The observed frequency for teachers reviewing the materials ($n = 20$) was lower than the expected frequency ($n = 25.5$). The observed frequency for teachers not reviewing the materials ($n = 31$) was higher than the expected frequency ($n = 25.5$). H4 was not supported.

Table 4

Observed and Expected Frequencies for H4

Response Category	$f_{observed}$	$f_{expected}$
Reviewed the materials	20	25.5
Did not review the materials	31	25.5

H5. Teachers reported they provided feedback on the selection survey.

The results of the chi-square test indicated no difference between the observed and expected values, $\chi^2(1) = 2.37$, $p = .123$. See Table 5 for the observed and expected frequencies. The observed frequency for teachers providing feedback on the selection survey ($n = 20$) was lower than the expected frequency ($n = 25.5$). The observed frequency for teachers not providing feedback on the selection survey ($n = 31$) was higher than the expected frequency ($n = 25.5$). H5 was not supported.

Table 5

Observed and Expected Frequencies for H5

Response Category	$f_{observed}$	$f_{expected}$
Provided feedback on the selection survey	20	25.5
Did not provide feedback on the selection survey	31	25.5

H6. Teachers perceive they had a voice in the selection of a new mathematics program.

A one-sample *t* test was conducted to test H6. The sample mean was compared to a test value of 3. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

The results of the one-sample *t* test indicated a statistically significant difference between the group mean and the test value, $t(49) = -5.262$, $p = .000$, Cohen's $d = .744$.

The sample mean (M = 2.02, SD = 1.32) was significantly lower than the test value (3). H6 was not supported. Teachers perceive they had a voice to a small extent in the selection of the new mathematics programs. The effect size indicated a medium effect.

RQ2

To what extent are teachers satisfied with the implementation of the new mathematics program?

H7. Teachers reported they were satisfied with the implementation of the new mathematics program.

A one-sample *t* test was conducted to address RQ2. The sample mean was compared to a test value of 3. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

The results of the one-sample *t* test indicated a statistically significant difference between the group mean and the test value, $t(50) = 6.421$, $p = .000$, Cohen's $d = 0.899$. The sample mean (M = 3.86, SD = 0.96) was significantly higher than the test value (3). H7 was supported. Teachers reported that they were satisfied with the implementation of the new mathematics program. The effect size indicated a large effect.

RQ3

To what extent do teachers use the new mathematics program resources?

H8. Teachers reported they use the assessments at least monthly.

A one-sample *t* test was conducted to test H8. The sample mean for the extent teachers reported they use the assessments at least monthly was compared to a test value

of 2.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

The results of the one-sample *t* test indicated a statistically significant difference between the group mean and the test value, $t(49) = 4.372$, $p = .000$, Cohen's $d = 0.618$. The sample mean ($M = 3.12$, $SD = 1.00$) was significantly higher than the test value (2.5). H8 was supported. Teachers reported that they used the assessments at least monthly. The effect size indicated a medium effect.

H9. Teachers reported that they used the Eureka Succeed booklets at least monthly.

A one-sample *t* test was conducted to test H9. The sample mean for the extent teachers reported they used the Eureka Succeed Booklets at least monthly was compared to a test value of 2.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

The results of the one-sample *t* test indicated a statistically significant difference between the group mean and the test value, $t(49) = -8.363$, $p = .000$, Cohen's $d = 1.183$. The sample mean ($M = 1.36$, $SD = 0.96$) was significantly lower than the test value (2.5). H9 was not supported. Teachers reported that they did not use the Eureka Succeed booklets at least monthly. The effect size indicated a large effect.

H10. Teachers reported that they used pacing and preparation guides at least weekly.

A one-sample *t* test was conducted to test H10. The sample mean for the extent teachers reported they used the pacing and preparation guides at least weekly was compared to a test value of 3.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

The results of the one-sample *t* test indicated there was not a statistically significant difference between the group mean and the test value, $t(48) = 0.374$, $p = .355$. The sample mean ($M = 3.57$, $SD = 1.34$) was not significantly higher than the test value (3.5). H10 was not supported. Teachers reported that they did not use pacing and preparation guides at least weekly.

H11. Teachers reported that they used curriculum maps at least weekly.

A one-sample *t* test was conducted to test H11. The sample mean for the extent teachers reported they used the curriculum maps at least weekly was compared to a test value of 3.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

The results of the one-sample *t* test indicated a statistically significant difference between the group mean and the test value, $t(49) = -2.648$, $p = .005$, Cohen's $d = 0.375$. The sample mean ($M = 3.04$, $SD = 1.23$) was significantly lower than the test value (3.5).

H11 was not supported. Teachers reported that they did not use curriculum maps at least weekly. The effect size indicated a small effect.

H12. Teachers reported that they used curriculum overviews at least weekly.

A one-sample *t* test was conducted to test H12. The sample mean for the extent teachers reported they used the curriculum overviews at least weekly was compared to a test value of 3.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

The results of the one-sample *t* test indicated a statistically significant difference between the group mean and the test value, $t(49) = -3.741$, $p = .000$, Cohen's $d = 0.529$. The sample mean ($M = 2.88$, $SD = 1.17$) was significantly lower than the test value (3.5). H12 was not supported. Teachers reported that they did not use curriculum overviews at least weekly. The effect size indicated a medium effect.

H13. Teachers reported that they used the standards checklist at least weekly.

A one-sample *t* test was conducted to test H13. The sample mean for the extent teachers reported they used the standards checklist at least weekly was compared to a test value of 3.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

The results of the one-sample *t* test indicated a statistically significant difference between the group mean and the test value, $t(50) = -4.401$, $p = .000$, Cohen's $d = 0.616$.

The sample mean (M = 2.76, SD = 1.19) was significantly lower than the test value (3.5). H13 was not supported. Teachers reported that they did not use the standards checklist at least weekly. The effect size indicated a medium effect.

H14. Teachers reported that they used online professional development at least weekly.

A one-sample *t* test was conducted to test H14. The sample mean for the extent teachers reported they used the online professional development at least weekly was compared to a test value of 3.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

The results of the one-sample *t* test indicated a statistically significant difference between the group mean and the test value, $t(50) = -13.555$, $p = .000$, Cohen's $d = 1.898$. The sample mean (M = 1.65, SD = 0.98) was significantly lower than the test value (3.5). H14 was not supported. Teachers failed to report that they used online professional development at least weekly. The effect size indicated a large effect.

H15. Teachers reported that they used sprints at least daily.

A one-sample *t* test was conducted to test H15. The sample mean for the extent teachers reported they used the sprints at least daily was compared to a test value of 4.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

The results of the one-sample *t* test indicated a statistically significant difference between the group mean and the test value, $t(50) = -4.26$, $p = .000$, Cohen's $d = 0.597$. The sample mean ($M = 3.80$, $SD = 1.17$) was significantly lower than the test value (4.5). H15 was not supported. Teachers reported that they did not use sprints daily. The effect size indicated a medium effect.

H16. Teachers reported that they used application problems at least daily.

A one-sample *t* test was conducted to test H16. The sample mean for the extent teachers reported they used the application problems at least daily was compared to a test value of 4.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

The results of the one-sample *t* test indicated there was not a statistically significant difference between the group mean and the test value, $t(50) = 1.065$, $p = .146$. The sample mean ($M = 4.61$, $SD = 0.72$) was not significantly higher than the test value (4.5). H16 was not supported. Teachers reported that they did not use application problems at least daily.

H17. Teachers reported that they used problem sets at least daily.

A one-sample *t* test was conducted to test H17. The sample mean for the extent teachers reported they used the problem sets at least daily was compared to a test value of 4.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated

from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

The results of the one-sample *t* test indicated a statistically significant difference between the group mean and the test value, $t(50) = 11.088$, $p = .000$, Cohen's $d = 1.553$. The sample mean ($M = 4.92$, $SD = 0.27$) was significantly higher than the test value (4.5). H17 was supported. Teachers reported that they used problem sets at least daily. The effect size indicated a large effect.

H18. Teachers reported that they used homework sets at least daily.

A one-sample *t* test was conducted to test H18. The sample mean for the extent teachers reported they used the homework sets at least daily was compared to a test value of 4.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

The results of the one-sample *t* test indicated a statistically significant difference between the group mean and the test value, $t(48) = -6.419$, $p = .000$, Cohen's $d = 0.917$. The sample mean ($M = 3.02$, $SD = 1.61$) was significantly lower than the test value (4.5). H18 was not supported. Teachers reported that they did not use the homework sets at least daily. The effect size indicated a large effect.

H19. Teachers reported that they used templates at least daily.

A one-sample *t* test was conducted to test H19. The sample mean for the extent teachers reported they used the templates at least daily was compared to a test value of 4.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the

comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

The results of the one-sample *t* test indicated a statistically significant difference between the group mean and the test value, $t(50) = -4.224$, $p = .000$, Cohen's $d = 0.591$. The sample mean ($M = 3.82$, $SD = 1.14$) was significantly lower than the test value (4.5). H14 was not supported. Teachers reported that they did use the templates at least daily. The effect size indicated a medium effect.

H20. Teachers reported that they used exit slips at least daily.

A one-sample *t* test was conducted to test H20. The sample mean for the extent teachers reported they used the exit slips at least daily was compared to a test value of 4.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

The results of the one-sample *t* test indicated there was not a statistically significant difference between the group mean and the test value, $t(50) = 1.072$, $p = .144$. The sample mean ($M = 4.31$, $SD = 1.24$) was not higher than the test value (4.5). H20 was not supported. Teachers reported that they did not use exit slips at least daily.

H21. Teachers reported that they used Affirm or Edulastic at least daily.

A one-sample *t* test was conducted to test H21. The sample mean for the extent teachers reported they used Affirm or Edulastic at least daily was compared to a test value of 4.5. The one-sample *t* test was chosen for the hypothesis testing because it

involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

The results of the one-sample *t* test indicated a statistically significant difference between the group mean and the test value, $t(49) = -11.075$, $p = .000$, Cohen's $d = 1.566$. The sample mean ($M = 2.38$, $SD = 1.35$) was significantly lower than the test value (4.5). H21 was not supported. Teachers reported that they did not use Affirm or Edulastic at least daily. The effect size indicated a large effect.

H22. Teachers reported that they used manipulative kits at least daily.

A one-sample *t* test was conducted to test H22. The sample mean for the extent teachers reported they used the manipulative kits at least daily was compared to a test value of 4.5. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

The results of the one-sample *t* test indicated a statistically significant difference between the group mean and the test value, $t(50) = -3.738$, $p = .000$, Cohen's $d = 0.523$. The sample mean ($M = 3.84$, $SD = 1.25$) was significantly lower than the test value (4.5). H22 was not supported. Teachers reported that they did not use manipulative kits at least daily. The effect size indicated a medium effect.

RQ4

To what extent is there a relationship between teachers' perceptions that they had a voice in the selection of the new mathematics program and their use of the components of the mathematics resource?

H23. There is a relationship between the teachers' perception that they had a voice in the selection and their use of assessments.

A Pearson product-moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics program and the extent teachers reported they used the assessments at least monthly. The statistical significance of the correlation coefficient was examined to test H23. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

The correlation coefficient (r = .034) provided evidence for no relationship between the variables. The hypothesis test for the correlation indicated no significant relationship between teachers' perceptions that they had a voice in the selection and their use of the assessments, df = 47, p = .819. H23 was not supported.

H24. There is a relationship between the teachers' perception that they had a voice in the selection and their use of Eureka Succeed booklets.

A Pearson product-moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics program and the extent teachers reported they used the Eureka Succeed booklets at least monthly. The

statistical significance of the correlation coefficient was examined to test H24. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

The correlation coefficient (r = -.006) provided evidence for no relationship between the variables. The hypothesis test for the correlation indicated no significant relationship between the teachers' perception that they had a voice in the selection and their use of Eureka Succeed booklets, df = 48, p = .968. H24 was not supported.

H25. There is a relationship between the teachers' perception that they had a voice in the selection and their use of pacing and preparation guides.

A Pearson product-moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the pacing and preparation guides at least weekly. The statistical significance of the correlation coefficient was examined to test H25. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

The correlation coefficient (r = .134) provided evidence for no relationship between the variables. The hypothesis test for the correlation indicated no significant relationship between the teachers' perception that they had a voice in the selection and their use of pacing and preparation guide, df = 46, p = .363. H25 was not supported.

H26. There is a relationship between the teachers' perception that they had a voice in the selection and their use of curriculum maps.

A Pearson product-moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the curriculum maps at least weekly. The statistical significance of the correlation coefficient was examined to test H26. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

The correlation coefficient (r = .217) provided evidence for no relationship between the variables. The hypothesis test for the correlation indicated no significant relationship between the teachers' perception that they had a voice in the selection and their use of curriculum maps, df = 47, p = .135. H26 was not supported.

H27. There is a relationship between the teachers' perception that they had a voice in the selection and their use of curriculum overviews.

A Pearson product-moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the curriculum overviews at least weekly. The statistical significance of the correlation coefficient was examined to test H27. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

The correlation coefficient (r = .219) provided evidence for no relationship between the variables. The hypothesis test for the correlation indicated no significant

relationship between the teachers' perception that they had a voice in the selection and their use of curriculum overviews, $df = 47$, $p = .131$. H27 was not supported.

H28. There is a relationship between the teachers' perception that they had a voice in the selection and their use of the standards checklist.

A Pearson product-moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the standards checklist at least weekly. The statistical significance of the correlation coefficient was examined to test H28. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

The correlation coefficient ($r = .351$) provided evidence for a moderately strong positive relationship between the variables. The hypothesis test for the correlation indicated a statistically significant relationship between the teachers' perception that they had a voice in the selection and their use of the standards checklist, $df = 48$, $p = .013$, $r^2 = .123$. H28 was supported. The index of the effect size indicated a medium-sized effect.

H29. There is a relationship between the teachers' perception that they had a voice in the selection and their use of online professional development.

A Pearson product-moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used online professional development at least weekly. The statistical significance of the correlation coefficient was examined to test H29. The

level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

The correlation coefficient (r = .100) provided evidence for no relationship between the variables. The hypothesis test for the correlation indicated no significant relationship between the teachers' perception that they had a voice in the selection and their use of online professional development, df = 48, p = .489. H29 was not supported.

H30. There is a relationship between the teachers' perception that they had a voice in the selection and their use of sprints.

A Pearson product-moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the sprints at least daily. The statistical significance of the correlation coefficient was examined to test H30. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

The correlation coefficient (r = .279) provided evidence for a moderately strong positive relationship between the variables. The hypothesis test for the correlation indicated a statistically significant relationship between the teachers' perception that they had a voice in the selection and their use of sprints, df = 48, p = .050, r^2 = .078. H30 was supported. The index of the effect size indicated a small-effect size.

H31. There is a relationship between the teachers' perception that they had a voice in the selection and their use of application problems.

A Pearson product-moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent

teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the application problems at least daily. The statistical significance of the correlation coefficient was examined to test H31. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

The correlation coefficient (r = .200) provided evidence for no relationship between the variables. The hypothesis test for the correlation indicated no significant relationship between the teachers' perception that they had a voice in the selection and their use of application problems, df = 48, p = .164. H31 was not supported.

H32. There is a relationship between the teachers' perception that they had a voice in the selection and their use of problem sets.

A Pearson product-moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the problem sets at least daily. The statistical significance of the correlation coefficient was examined to test H32. The level of significance was set at .05. The effect size, as indexed by Cohen's *d*, is reported when appropriate.

The correlation coefficient (r = .118) provided evidence for no relationship between the variables. The hypothesis test for the correlation indicated no significant relationship between the teachers' perception that they had a voice in the selection and their use of problem sets, df = 48, p = .416. H23 was not supported.

H33. There is a relationship between the teachers' perception that they had a voice in the selection and their use of homework sets

A Pearson product-moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the homework sets at least daily. The statistical significance of the correlation coefficient was examined to test H33. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

The correlation coefficient (r = .460) provided evidence for a moderately strong positive relationship between the variables. The hypothesis test for the correlation indicated a statistically significant relationship between the teachers' perception that they had a voice in the selection and their use of homework sets, df = 46, p = .001, r^2 = .212. H33 was supported. The index of the effect size indicated a medium-effect size.

H34. There is a relationship between the teachers' perception that they had a voice in the selection and their use of templates

A Pearson product-moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the templates at least daily. The statistical significance of the correlation coefficient was examined to test H34. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

The correlation coefficient (r = .418) provided evidence for a moderately strong positive relationship between the variables. The hypothesis test for the correlation indicated a statistically significant relationship between the teachers' perception that they had a voice in the selection and their use of templates, df = 48, p = .003, r^2 = .174. H34 was supported. The index of the effect size indicated a medium-sized effect.

H35. There is a relationship between the teachers' perception that they had a voice in the selection and their use of exit slips.

A Pearson product-moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the exit slips at least daily. The statistical significance of the correlation coefficient was examined to test H35. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

The correlation coefficient (r = .095) provided evidence for no relationship between the variables. The hypothesis test for the correlation indicated no significant relationship between the teachers' perception that they had a voice in the selection and their use of exit slips, df = 48, p = .509. H35 was not supported.

H36. There is a relationship between the teachers' perception that they had a voice in the selection and their use of Affirm or Edulastic.

A Pearson product-moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and

the extent teachers reported they used Affirm or Edulastic at least daily. The statistical significance of the correlation coefficient was examined to test H36. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

The correlation coefficient (r = -.140) provided evidence for no relationship between the variables. The hypothesis test for the correlation indicated no significant relationship between the teachers' perception that they had a voice in the selection and their use of Affirm or Edulastic, df = 47, p = .338. H36 was not supported.

H37. There is a relationship between the teachers' perception that they had a voice in the selection and their use of manipulative kits.

A Pearson product-moment correlation coefficient was calculated to index the strength and direction of the relationship between the two numerical variables: the extent teachers perceived they had a voice in the selection of the new mathematics resource and the extent teachers reported they used the manipulative kits at least daily. The statistical significance of the correlation coefficient was examined to test H37. The level of significance was set at .05. The effect size, as indexed by r^2, is reported when appropriate.

The correlation coefficient (r = .223) provided evidence for no relationship between the variables. The hypothesis test for the correlation indicated no significant relationship between the teachers' perception that they had a voice in the selection and their use of manipulative kits, df = 48, p = .120. H37 was not supported.

RQ5

To what extent do teachers perceive they received quality professional development for the new mathematics program?

H38. Teachers perceive they received quality professional development for the new mathematics program.

A one-sample *t* tests was conducted to address RQ5. The sample mean was compared to a test value of 3. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

The results of the one-sample *t* test indicated there was not a statistically significant difference between the group mean and the test value, $t(50) = -0.340$, $p = .368$. The sample mean ($M = 2.96$, $SD = 0.82$) was not significantly higher than the test value (3). H38 was not supported. Teachers do not perceive that they received quality professional development for the new mathematics program.

RQ6

To what extent were each of the components of the new mathematics program covered during the professional development?

Fifteen one-sample *t* tests were conducted to address RQ6. For each test, the sample mean was compared to a test value of 3. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of

significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

H39. Teachers perceive that the assessments were covered during professional development.

The results of the one-sample *t* test indicated there was not a statistically significant difference between the group mean and the test value, $t(49) = 0.562$, $p = .288$. The sample mean ($M = 3.08$, $SD = 1.01$) was not significantly higher than the test value (3). H39 was not supported. Teachers do not perceive that the assessments were covered during professional development.

H40. Teachers perceive that the Eureka Succeed booklets were covered during professional development.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, $t(50) = -10.130$, $p = .000$. The sample mean ($M = 1.61$, $SD = 0.98$) was significantly lower than the test value (3). H40 was not supported. Teachers do not perceive that the Eureka Succeed booklets were covered during professional development.

H41. Teachers perceive that the pacing and preparations guides were covered during professional development.

The results of the one-sample *t* test indicated there was not a statistically significant difference between the group mean and the test value, $t(50) = -0.306$, $p = .380$. The sample mean ($M = 2.96$, $SD = 0.92$) was not significantly higher than the test value (3). H41 was not supported. Teachers do not perceive that the pacing and preparation guides were covered during professional development.

H42. Teachers perceive that the curriculum maps were covered during professional development.

The results of the one-sample *t* test indicated there was not a statistically significant difference between the group mean and the test value, $t(50) = -0.973$, $p = .168$. The sample mean ($M = 2.88$, $SD = 0.86$) was not significantly higher than the test value (3). H42 was not supported. Teachers did not perceive that the curriculum maps were covered during professional development.

H43. Teachers perceive that the curriculum overviews were covered during professional development.

The results of the one-sample *t* test indicated there was not a statistically significant difference between the group mean and the test value, $t(50) = 0.726$, $p = .236$. The sample mean ($M = 3.10$, $SD = 0.96$) was not significantly higher than the test value (3). H43 was not supported. Teachers did not perceive that the curriculum overviews were covered during professional development.

H44. Teachers perceive that the standards checklist was covered during professional development.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, $t(50) = -2.362$, $p = .011$. The sample mean ($M = 2.69$, $SD = 0.95$) was significantly lower than the test value (3). H44 was not supported. Teachers do not perceive that the standards checklist was covered during professional development.

H45. Teachers perceive that the online professional development was covered during professional development.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, $t(50) = -6.872$, $p = .000$. The sample mean ($M = 2.00$, $SD = 1.04$) was significantly lower than the test value (3). H45 was not supported. Teachers do not perceive that the online professional development was covered during professional development.

H46. Teachers perceive that the sprints were covered during professional development.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, $t(50) = 3.122$, $p = .001$, Cohen's $d = 0.437$. The sample mean ($M = 3.41$, $SD = 0.94$) was significantly higher than the test value (3). H46 was supported. Teachers perceive that the sprints were covered during professional development. The effect size indicated a small effect.

H47. Teachers perceive that the application problems were covered during professional development.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, $t(50) = 3.510$, $p = .001$, Cohen's $d = 0.492$. The sample mean ($M = 3.43$, $SD = 0.88$) was significantly higher than the test value (3). H47 was supported. Teachers perceive that the application problems were covered during professional development. The effect size indicated a small effect.

H48. Teachers perceive that the problem sets were covered during professional development.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, $t(50) = 4.461$, $p = .000$, Cohen's

d = 0.625. The sample mean (*M* = 3.55, *SD* = 0.88) was significantly higher than the test value (3). H48 was supported. Teachers perceive that the problem sets were covered during professional development. The effect size indicated a medium effect.

H49. Teachers perceive that the homework sets were covered during professional development.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, *t*(50) = -3.006, *p* = .002. The sample mean (*M* = 2.57, *SD* = 1.02) was significantly lower than the test value (3). H49 was not supported. Teachers do not perceive that the homework sets were covered during professional development.

H50. Teachers perceive that the templates were covered during professional development.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, *t*(49) = -3.145, *p* = .001. The sample mean (*M* = 2.54, *SD* = 1.03) was significantly lower than the test value (3). H50 was not supported. Teachers do not perceive that the templates were covered during professional development.

H51. Teachers perceive that the exit slips were covered during professional development.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, *t*(50) = 1.694, *p* = .048, Cohen's *d* = 0.237. The sample mean (*M* = 3.24, *SD* = 0.99) was significantly higher than the test

value (3). H51 was supported. Teachers perceive that the exit slips were covered during professional development. The effect size indicated a small effect.

H52. Teachers perceive that Affirm or Edulastic were covered during professional development.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, $t(50) = -10.587$, $p = .000$. The sample mean ($M = 1.65$, $SD = 0.91$) was significantly lower than the test value (3). H52 was not supported. Teachers do not perceive that Affirm or Edulastic were covered during professional development.

H53. Teachers perceive that the manipulatives kits were covered during professional development.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, $t(50) = -3.564.$, $p = .000$. The sample mean ($M = 2.39$, $SD = 1.22$) was significantly lower than the test value (3). H53 was not supported. Teachers do not perceive that the manipulatives kits were covered during professional development.

RQ7

To what extent are the instructional strategies associated with each of the standards for mathematical practice utilized by teachers?

Eight one-sample *t* tests were conducted to address RQ7. For each test, the sample mean was compared to a test value of 3. The one-sample *t* test was chosen for the hypothesis testing because it involves the comparison of one group mean with a known value, and the group mean is calculated from a numerical variable. The level of

significance was set at .05. When appropriate, the effect size, as indexed by Cohen's *d*, is reported.

H54. Teachers perceive the instructional strategies associated with the standard, make sense of problems and persevere in solving them, are utilized by teachers.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, $t(50) = 14.282$, $p = .000$, Cohen's $d = 2.000$. The sample mean ($M = 4.25$, $SD = 0.63$) was significantly higher than the test value (3). H54 was supported. Teachers perceive the instructional strategies associated with the standard, make sense of problems and persevere in solving them, are utilized by teachers. The effect size indicated a large effect.

H55. Teachers perceive the instructional strategies associated with the standard, reason abstractly and quantitatively, are utilized by teachers.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, $t(50) = 9.948$, $p = .000$, Cohen's $d = 1.393$. The sample mean ($M = 3.94$, $SD = 0.68$) was significantly higher than the test value (3). H55 was supported. Teachers perceive the instructional strategies associated with the standard, reason abstractly and quantitatively, are utilized by teachers. The effect size indicated a large effect.

H56. Teachers perceive the instructional strategies associated with the standard, construct viable arguments and critique the reasoning of others, are utilized by teachers.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, $t(50) = 5.036$, $p = .000$, Cohen's $d = 0.705$. The sample mean ($M = 3.57$, $SD = 0.81$) was significantly higher than the test

value (3). H55 was supported. Teachers perceive the instructional strategies associated with the standard, construct viable arguments and critique the reasoning of others, are utilized by teachers. The effect size indicated a medium effect.

H57. Teachers perceive the instructional strategies associated with the standard, model with mathematics, are utilized by teachers.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, $t(50) = 17.969$, $p = .000$, Cohen's $d = 2.516$. The sample mean ($M = 4.45$, $SD = 0.58$) was significantly higher than the test value (3). H57 was supported. Teachers perceive the instructional strategies associated with the standard, model with mathematics, are utilized by teachers. The effect size indicated a large effect.

H58. Teachers perceive the instructional strategies associated with the standard, use appropriate tools strategically, are utilized by teachers.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, $t(49) = 14.139$, $p = .000$, Cohen's $d = 2.000$. The sample mean ($M = 4.28$, $SD = 0.64$) was significantly higher than the test value (3). H58 was supported. Teachers perceive the instructional strategies associated with the standard, use appropriate tools strategically, are utilized by teachers. The effect size indicated a large effect.

H59. Teachers perceive the instructional strategies associated with the standard, attend to precision, are utilized by teachers.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, $t(50) = 7.753$, $p = .000$, Cohen's

d = 1.086. The sample mean (*M* = 3.90, *SD* = 0.83) was significantly higher than the test value (3). H59 was supported. Teachers perceive the instructional strategies associated with the standard, attend to precision, are utilized by teachers. The effect size indicated a large effect.

H60. Teachers perceive the instructional strategies associated with the standard, look for and make use of structure, are utilized by teachers.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, *t*(50) = 7.157, *p* = .000, Cohen's *d* = 1.002. The sample mean (*M* = 3.78, *SD* = 0.78) was significantly higher than the test value (3). H60 was supported. Teachers perceive the instructional strategies associated with the standard, look for and make use of structure, are utilized by teachers. The effect size indicated a large effect.

H61. Teachers perceive the instructional strategies associated with the standard, look for and express regularity in repeated reasoning, are utilized by teachers.

The results of the one-sample *t* test indicated there was a statistically significant difference between the group mean and the test value, *t*(50) = 6.365, *p* = .000, Cohen's *d* = 0.891. The sample mean (*M* = 3.84, *SD* = 0.95) was significantly higher than the test value (3). H61 was supported. Teachers perceive the instructional strategies associated with the standard, look for and express regularity in repeated reasoning, are utilized by teachers. The effect size indicated a large effect.

Summary

This study's data analysis results were reported in this chapter. Chapter 5 includes a study summary and the findings related to the literature. Also found in Chapter 5 are the conclusions.

Chapter 5

Interpretation and Recommendations

Teachers in a small urban school district provided feedback about the selection process used for adopting a new mathematics resource. Teachers also reported information regarding how they use the new resource and the professional development provided during the adoption process. The researcher also examined the relationship between the extent teachers perceived that they had a voice in the selection process and their use of the new mathematics resource. This chapter includes a study summary, the findings related to the literature, and the conclusions.

Study Summary

Little research has been conducted related to the resource selection and implementation process. It is a topic that largely affects school districts, but there is a lack of research on this subject, especially when it comes to what effects the level of implementation and use of the new resource has on teacher and student learning. Examined in this study were teachers' perceptions of whether they had a voice in the mathematics resource selection process. The adoption process and implementation of the new mathematics resource were also examined. This section includes an overview of the problem, the purpose statement and research questions, a review of the methodology, and the major findings.

Overview of the Problem

With Missouri's many curricula standard changes, one small urban school district struggled with the constant work around the standards and curriculum. Through this process, teachers and administrators learned that a shared resource was needed to ensure

equity for all students regardless of the elementary school where a student was enrolled. A committee was formed, and a resource was selected through a process determined by district administration. Because of time restraints on the district and the fact that there was no policy or procedures for the adoption process for new materials, the district wanted feedback on the process used to select the resource. The district teachers also received three full professional development days and individual support for teachers during the first year of implementation. The district also wanted to know if the implementation process was perceived as successful and whether teachers used the resource components after this process. Last, the district needed to know whether teachers perceived they received quality professional development with this resource, how well components were covered during that professional development, and if the components were being utilized as expected. (personal communication, executive director of academic services, May 24, 2021)

Purpose Statement and Research Questions

The first purpose of this study was to examine to what extent teachers perceived that they had a voice in the selection of the new mathematics program. The second purpose of this study was to determine to what extent teachers are satisfied with the implementation of the new mathematics program. The third purpose of this study was to examine to what extent teachers use the new mathematics program resources. The fourth purpose of this study was to examine to what extent there is a relationship between teachers' perceptions that they had a voice in the selection of a new mathematics program and their use of the components of mathematics resources. The fifth purpose of this study was to examine to what extent teachers perceive they received quality professional

development for the new mathematics program. The sixth purpose of this study was to examine to what extent each new mathematics program component is covered during professional development. The last purpose of this study was to examine to what extent are the instructional strategies associated with each of the standards for mathematical practice utilized by teachers. Seven research questions were posed to address the purposes of this study, and 53 hypotheses were tested.

Review of the Methodology

This study was completed with a quantitative descriptive research design using survey methods. There were multiple variables examined in this study, including teachers' perceptions of their voice in the selection process, satisfaction with the implementation of the new resource, and usage of the components of the new mathematics resource. The participants in this study included kindergarten through fifth-grade teachers employed by District C during the 2019-2021 school years who took part in this selection, adoption, and implementation process. A researcher-developed survey with feedback from building administrators who were present for the selection and adoption process was utilized in this study. The survey was approved and sent out to the district's elementary teachers by the executive director of academic services and saved and archived by the district. This archived data was then released to the researcher. The researcher used chi-square tests for goodness of fit for H1-H5, one-sample *t* tests for H6-H22 and H38-61, and Pearson product-moment correlation coefficient for H23-H37.

Major Findings

The results of the analyses indicated that the teachers' perceptions of a new mathematics program's selection and adoption process were mixed. RQ1 examined to

what extent teachers' felt they had a voice in the selection process, and the analysis results indicated the following.

- More teachers than expected reported that they were not selection committee members and did not pilot the program.
- Although the differences were not significant, more teachers than expected did not review the materials and did not provide feedback on the selection survey.
- Teachers perceived that they had a small voice or influence in the selection of the new mathematics resource.

RQ2 examined how satisfied teachers are with the implementation of the new mathematics program. The results provided evidence that teachers were satisfied with the implementation of the new mathematics program.

RQ3 examined the extent teachers are using the new mathematics resources. The results provided evidence that

- Teachers reported that they use the assessments at least monthly and use the problem sets at least daily.
- Teachers reported that they do not use the Eureka Succeed booklets at least monthly; curriculum maps, pacing and preparation guides, curriculum overviews, the standards checklist, and online professional development at least weekly; sprints, homework sets, templates, Affirm or Edulastic, manipulative kits, application problems and exit slips at least daily.

- Teachers report that they do not use the pacing and preparation guides at least weekly or the application problems and exit slips at least daily, but there was no statistically significant difference.

RQ4 examined if there was a relationship between teachers' perception that they had a voice in the selection process and their use of the components of the mathematics resource. The data analysis results indicated a moderately strong relationship between teachers' perceptions that they had a voice in the selection process and the use of templates, homework sets, sprints, and the standards checklist. Additionally, the results provided evidence that there was no relationship between teachers' perceptions that they had a voice in the selection process and their use of assessments, Eureka Succeed booklets, pacing and preparation guides, curriculum maps, curriculum overviews, online professional development, application problems, problem sets, exit slips, Affirm or Edulastic, and manipulative kits.

RQ5 examined the professional development provided with the mathematics resource. This research question examined how teachers perceived the quality of professional development that was provided with the mathematics resource. The analysis indicated that teachers reported that they did not receive quality professional development for the new mathematics resource.

RQ6 also examined the professional development provided with the mathematics resource. The research question examined how well the components of the new mathematics resource were covered during professional development. The data analysis provided evidence that the following components of the new mathematics resource were covered during the professional development: sprints, application problems, problem sets,

and exit slips. Teachers did not perceive that the following components of the new mathematics resource were covered during professional development: assessments, Eureka Succeed booklets, pacing and preparation guides, curriculum maps, curriculum overviews, standards checklist, online professional development, homework sets, templates, Affirm or Edulastic, and manipulatives kits.

RQ7 addressed teachers' perceptions that teachers utilize the instructional strategies associated with the SMPs. Teachers perceived that all the instructional strategies associated with the SMPs were utilized

Findings Related to the Literature

This section compares the current study's findings to those in the literature review. There were few studies available to compare to the current study's findings. These are the findings related to the literature that the researcher found.

In the current study, teachers reported they had little voice in the selection of the mathematics resource. This finding aligns with Kalder's (2001) findings that teachers often felt that committees can make recommendations for a resource but that the upper administration ultimately makes the decision. This finding contrasts with Lee's (2021) finding, which stated that teachers perceived that they had a voice in the selection process. However, Lee (2021) showed that teachers were more active in the selection process than in this current study.

In the current study, teachers reported they are not using all the components of the mathematics resource. This finding supports Bartiromo and Etkina (2009) that teachers do not use all the components of a resource but instead treat a new resource as a tool. Teachers in the current study reported not using many mathematics resource components,

but all the components covered during professional development were reported as being consistently used. This finding aligns with Carreker et al. (2010), who concluded that teachers implement a limited number of strategies, usually those presented during professional development.

Nevenglosky et al. (2017) concluded that a large barrier to effective resource implementation is a lack of fidelity. In the current study, teachers reported they are not implementing most of the components of the mathematics resource. Therefore, it could reinforce the conclusion that fidelity is a significant problem with resource implementation.

Teachers in the current study reported that they did not receive quality professional development. All professional development was provided in large group settings within one day. This finding aligns with Hammond and Moore (2018) because they concluded that professional development did not change teachers' instruction if provided in the large group one-time model. This finding also aligns with Sims et al. (2021) meta-analysis that concludes that professional development tends to have a small positive impact. Sims et al. (2021) found that teachers would not use the resource as intended if professional development was not considered quality. The finding of the current study aligns with Sims et al. (2021), as teachers did not see this professional development as quality and reported that many resource components are not being used as intended.

Overall, little research has been conducted on resource selection and implementation. It is a topic that largely affects school districts, but there is a lack of research on this subject, especially when it comes to what affects the level of

implementation and use of the new resource. There is also limited research on the use of professional development with a newly adopted resource.

Conclusions

The resource selection and implementation process should ultimately impact instruction and, eventually, student achievement; however, little research has been conducted on this topic. Of the research that has been completed, it has produced mixed results. School district C selected a process to adopt and implement a new mathematics resource. This study on teachers' feedback from that process provided some noteworthy findings. This section includes implications for actions, recommendations for future research, and concluding remarks.

Implications for Action

This study allowed District C to determine teachers' perceptions regarding a new resource's adoption and implementation process. The study's results indicated that teachers did not feel they had a voice in the process. Therefore, District C could ensure that they have higher participation rates in the selection process. District administration could also explore why teachers perceived they did not have a more significant voice in the process. The district plans to spend the next few years adopting more curriculum resources; therefore, this could be an excellent time to review this process more closely and refine it.

The study's findings provided evidence that teachers are not using many resource components. Therefore, more professional development needs to be offered related to these resources. Teachers also reported that they only felt four components were covered during the provided professional development. Therefore, District C needs to use the data

collected on the covered components and ensure that future professional development includes the components that were not covered and/or are not being used by teachers. They also need to ensure that professional development for district teachers examines all the components and ensures they are covered during that professional development time. The literature review also featured studies showing how professional development, which consists of a one-day large class, is ineffective. The results of the current study show this has been true for District C. Therefore, District C might benefit from looking at the professional development format and seeing what other formats the district can offer. The hope would be that professional development with a different format would be more effective at changing teachers' behaviors and eventually affect instruction.

Teachers also reported that they are using the strategies for the SMPs. District C can take this opportunity to evaluate teachers' understanding of the SMPs. District C can also evaluate how teachers teach these strategies for the SMPs if they are not using the resource components. Many of the results from this study were not what District C expected; therefore, the district needs to spend some time looking at the selection and implementation process used. These results indicate an opportunity for District C to refine its selection and adoption process to ensure better findings and outcomes.

Recommendations for Future Research

The study was conducted to determine teachers' perceptions of the selection and adoption process implemented by District C. There are other opportunities for future research that have presented themselves during the study. This process was completed with an elementary mathematics program but could be replicated with secondary teachers or a different content area.

This data could also be analyzed to determine if there is a relationship between the components of the mathematics resource that were perceived as covered during professional development and the fidelity in using those in the classroom. This analysis would allow the researcher to evaluate if professional development played a role in why the teachers are not utilizing some components as they should be and if other components are being used as expected.

Many of the teachers who responded to the survey reported that they are covering the strategies for the SMPs. The research around the SMPs showed a lack of consensus over what each SMP expects of the students. Therefore, a future researcher could look at the teacher's criteria for determining if they are teaching that strategy and see if there is a consensus on what each SMP requires. A researcher could examine if teachers genuinely understand the SMPs and if they correctly evaluate their use of these strategies in their classroom.

This researcher also examined if there was a relationship between the extent that teachers perceived they had a voice in the selection process and their use of the different components of the mathematical resource. There was no relationship between the extent teachers perceived that they had a voice in the selection process and their use of some of the components of the mathematical resource. However, a significant relationship was found between the extent to which teachers perceived that they had a voice in the selection process and their use of other components of the mathematical resource. Therefore, more research and analysis must be completed to examine why there is a relationship between some components and not with others. It may also be necessary to look if there is a relationship between the components covered in professional

development and those not covered during professional development. With more research, one could examine how this factors into if there is a relationship with the extent that the teachers perceive that they have a voice in the process.

Other school districts should also replicate this study with their selection process. This way, they can determine how the process affects the teachers' perceptions and implementation. The recommendation could also be made for this district and others to conduct qualitative research to examine more closely what parts of the process teachers agree with or disagree with and how those parts affect teachers' perceptions and resource implementation. More research needs to be completed on this topic in general, as there is not much research available. Research regarding the effect the process of resource adoption could have on resource implementation and its relationship with student learning is especially needed.

Concluding Remarks

There are many ways in which the selection and adoption of a resource affect the classrooms in a district. Therefore, it is intriguing why there is such limited research on the subject. It is clear from the studies related to teachers' perceptions of the selection process that if districts want teachers to perceive that they have a voice in the selection process, districts need to ensure that teachers have a significant role in the selection process. However, more research is needed so that educators have a more extensive understanding of resource adoption and implementation.

There is also limited research on professional development for using new resources and textbooks. This lack of research is concerning when professional development and resource implementation play such a role in the classroom. There is also

limited information on what role these factors play in the classroom and how impactful it is to actual student achievement. While this study rendered various conclusions about the perceptions of the teachers of the resource selection, the implementation of the resource, and the professional development associated with the resource, it is evident that more research is needed and that districts need to reevaluate their selection and adoption processes to gain a better understanding of the factors that affect resource implementation.

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Appendices

Appendix A: Mathematics Resource Adoption Process and Professional Development Survey

Eureka Math Survey

1. 1. To what extent did you take part in the selection of the new mathematics resource, Eureka Math? Mark all that apply

   Check all that apply.

   - [ ] Member of the selection committee
   - [ ] Piloted the program
   - [ ] Sat in on publisher's presentation
   - [ ] Reviewed the materials
   - [ ] Provided feedback on the survey
   - [ ] Did not take part in the selection process

2. 2. To what extent do you perceive you had a voice in the selection of a new mathematics resource, Eureka Math?

   Mark only one oval.

   - ◯ Not at all
   - ◯ A little extent
   - ◯ Some extent
   - ◯ A moderate extent
   - ◯ A large extent

3. 3. To what extent do you perceive other teachers had a voice in the selection of a new mathematics resource, Eureka Math?

Mark only one oval.

- ◯ Not at all
- ◯ A little extent
- ◯ Some extent
- ◯ A moderate extent
- ◯ A large extent

4. 4. How satisfied are you with the implementation of the new mathematics resource, Eureka Math?

Mark only one oval.

- ◯ Very Dissatisfied
- ◯ Dissatified
- ◯ Unsure
- ◯ Satisfied
- ◯ Very Satisfied

5. 5. Please rate how often you use each of the components of the new mathematics resource, Eureka Math?

Mark only one oval per row.

	Do not use	Use quarterly or semesterly	Use monthly	Use weekly	Use daily
Pacing and Preparation Guides					
Curriculum Map					
Curriculum Overviews					
Standards Checklist					
Sprints					
Application Problems					
Problem Sets					
Homework Sets					
Templates					
Exit Slips					
Assessments					
Eureka Succeed Booklets					
Affirm / Edulastic					
Manipulative Kits					
Online professional development help					

6. 6. In general, how would you rate the quality of the professional development you received for the new mathematics resource, Eureka Math?

Mark only one oval.

- Poor
- Fair
- Good
- Very good
- Excellent

7. 7. To what extent were these components covered during the professional development provided for the new mathematics resource, Eureka Math?

Mark only one oval per row.

	Not covered	Slight extent	Moderate extent	Large extent	Extensively
Pacing and Preparation Guides					
Curriculum Map					
Curriculum Overviews					
Standards Checklist					
Sprints					
Application Problems					
Problem Sets					
Homework Sets					
Templates					
Exit Slips					
Assessments					
Eureka Succeed Booklets					
Affirm / Edulastic					
Manipulative Kits					
Online professional development help					

8. 8. How often are instructional strategies associated with each of the standards for mathematical practices utilized in the new mathematics resource, Eureka Math?

Mark only one oval per row.

	Never	Rarely	Occasionally	Often	Always
Make sense of problems and persevere in solving them.	◯	◯	◯	◯	◯
Reason abstractly and quantitatively.	◯	◯	◯	◯	◯
Construct viable arguments and critique the reasoning of others.	◯	◯	◯	◯	◯
Model with mathematics	◯	◯	◯	◯	◯
Use appropriate tools strategically.	◯	◯	◯	◯	◯
Attend to precision	◯	◯	◯	◯	◯
Look for and make use of structure.	◯	◯	◯	◯	◯
Look for and express regularity in repeated reasoning.	◯	◯	◯	◯	◯

Appendix B: School District A Permission for Research

RE: Email for survey data for Disertation

[redacted]

Fri 5/7/2021 4:24 PM

To: Samantha York [redacted]

Good evening

I do not have a problem with the survey.

From: Samantha York [redacted]
Sent: Friday, May 7, 2021 3:48 PM
To: [redacted]
Subject: Email for survey data for Disertation

Dr. [redacted]

Here is the email that my advisor and I have drafted out to send with the survey. The survey is attached to the document. My dissertation is looking at the process that was used with the adoption of Eureka Math and if teachers felt that they had a voice in the selection. I personally really thought the process was well done and I am wanting to see if the data reflects the same. I am also looking to see if the more involved the teachers were in the process has a relationship to the implementation. The last piece just looks at the professional development that came with the program and what components of the program are being used.

My advisor did want me to draft an email for [redacted] to send out which is attached. That can be changed or tweaked if need be. [redacted], I just need you to agree to the survey and then [redacted] can send it out. If there are any concerns or things that I am not clear about, please let me know. Thanks so much for everything again.

Sam York

[redacted]

[redacted]

Appendix C: Institutional Review Board Approval Letter

Baker University Institutional Review Board

June 6th, 2022

Dear Samantha Bungart and Susan Rogers,

The Baker University IRB has reviewed your project application and approved this project under Exempt Status Review. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

Please be aware of the following:

1. Any significant change in the research protocol as described should be reviewed by this Committee prior to altering the project.
2. Notify the IRB about any new investigators not named in original application.
3. When signed consent documents are required, the primary investigator must retain the signed consent documents of the research activity.
4. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.
5. If the results of the research are used to prepare papers for publication or oral presentation at professional conferences, manuscripts or abstracts are requested for IRB as part of the project record.
6. If this project is not completed within a year, you must renew IRB approval.

If you have any questions, please contact me at npoell@bakeru.edu or 785.594.4582.

Sincerely,

Nathan Poell, MLS
Chair, Baker University IRB

Baker University IRB Committee
Sara Crump, PhD
Nick Harris, MS
Susan Rogers, PhD