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Perceptions of Guided Math

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Abstract

In this study the researcher sought to find how her students perceived guided math instruction in a first grade classroom. She also explored parents' perceptions of their child's math experiences in the first grade. Finally, she examined how the teachers in the classroom perceived guided math instruction. Data was collected through student surveys, parent surveys, student interviews, a teacher interview, and observation data. Data was analyzed using the constant comparative method and descriptive statistics. In the end, the researcher found that the students' overall response to guided math instruction was positive. Most of all the students enjoyed the aspect of choice presented in guided math. Teachers were also found to have an overall positive perception of guided math instruction. Teachers found that guided math allowed for greater differentiation of instruction. Parents were found to have seen improvement in their child's math progress throughout the school year.

Perceptions of Guided Math

When teachers consider themselves to be lifelong learners who are always looking for the best way to meet their students' needs, great things can happen:

“And that’s when I thought to myself... ‘Why... you know, they’re not all in the same place, as far as their math skills. Just exactly like they’re not all in the same place in their reading skills. So why am I not teaching math more like you know more similar to what I’m teaching reading?’ In other words, small group!”

This quote was taken from the interview I conducted with my cooperating teacher. This is a question about math instruction that I have asked myself before, as well as a wonderful point that I have read in countless articles. When asked about how she implemented guided math as well as some benefits she has seen from guided math she responded with the following:

“Okay, well once I started guided math umm the first thing of course is the pre-test and analyzing their pre-tests, putting them in groups, and kind looking at what it is they already know and obviously what they don’t know. You know you don’t want to assume anything. You definitely want to teach it all whole-group but when you are looking at what you are teaching here at the small group table you know you don’t want them to get bored, so you want to challenge them and teach them some things that they don’t know yet or extend upon their learning. You are really teaching to their ability here at the table where your lower level kids are getting what they need and they are not getting left behind. Or at the same time your higher-level kiddos are not bored, but they are being challenged on based on what they already know. So I think that’s the best is that you are meeting the kids where they are and taking them where they need to go.”

Purpose

Juniper Elementary School (all names are pseudonyms) is located in Timberland, Texas. Timberland is a mid-sized west-central Texas City with a population of around 120,000. Juniper is one of 14 elementary schools in the city. Of the 14 elementary schools, 9 qualify as Title 1. This school year, Juniper no longer qualifies as a Title 1 school. The Timberland ISD Website estimates that there are approximately 16,900 students enrolled in its schools. The ethnic composition of the district is 43% Hispanic, 12% African American, 4% two or more races, and 2% Asian/ Pacific Islander. The district also estimates that approximately 65% of students in Timberland ISD are economically disadvantaged. According to Juniper's School Report Card for the 2015-2016 school year the schools serves 554 students. At Juniper Elementary, 48.0% of students are White, 30.5% are Hispanic, 10.6% of students are African American, 4.3% are Asian, 5.2% identify with more than one race, and 0.9% are American Indian, 0.4% are Pacific Islander. Over 64% of students are Economically Disadvantaged, 5.1% are English Language Learners, and 7.2% qualify for Special Education.

As a year-long clinical teacher enrolled in a Master's of Education program, one of my requirements was to conduct an action research study in my classroom. I completed this action research in a first grade classroom. The purpose of this research study was to understand the perceptions that students, their parents, and their teacher have towards guided math. My research question was as follows: How do the students, parents, and teachers in my first grade classroom perceive guided math instruction? In this study I sought to understand how these various parties perceive guided math and how these perceptions can shed light on this differentiated style of math instruction.

Related Literature

Small group instruction has long been a staple in education and can be observed in classrooms across the country. Teaching children reading using homogenous, guided reading groups is widely implemented and generally accepted as good practice. Grouping students based on their reading ability

in order to differentiate instruction is a widely accepted and researched practice. So why is it that this approach has not been applied to other subject areas? Guided math is a method of math instruction that works in a similar way to guided reading groups. Ability math grouping is a similar concept, but the research and reach of this practice is significantly less. However, guided math is a method of instruction that deserves more attention, because students' mathematical skills fall along a range that can vary just as widely as their reading levels (Kobelin, 2009).

Newton (2013) argued that guided math allows teachers to meet students at their level and give them what they need to grow in their mathematical skills. This method of instruction allows the teacher to place students into groups based on their abilities in a certain unit of mathematics. Students are given a pre-test before every new math unit and are placed into small groups based on how they score; groups can have as few as two students and as many as six students. The teacher can split the class in whatever way suits their needs, and individual students are able to work on building their mathematical knowledge in the small group setting (Merritt, 2017). The groups are flexible and may change with each new unit of study. Guided math rotations generally begin with a whole group lesson that allows the teacher to briefly introduce the lesson to the entire class, usually when new skills are introduced (Donovan, 2013). After the whole group lesson, the class divides into small groups around the room. While the teacher is working with a group, the rest of the class works in small groups at different math activities around the room to practice the new skills being taught in the unit. The teacher sees each math group every single day that a math lesson is taught.

Guided math instruction relies heavily on assessment. The guided math groups are formed based on the unit pre-assessment. The results of the assessment allow the teacher to see what students already know. Assessment is key to differentiating instruction, and a pre-assessment is especially valuable in creating small groups based on students' needs. Assessment helps to shape instruction and learning goals, it provides data about students' current knowledge and misconceptions, and it provides feedback to the students as well (Moon, 2005). Donovan (2013) also found that the results of

assessment were used to inform instruction and to differentiate for students with similar skills and challenges.

The goal that guided math instruction is aiming towards is providing an avenue for differentiating instruction (Donovan, 2013). Differentiation has become quite the buzzword in the education world. While not everyone may be using the term “differentiation,” many educators are striving to provide their students with individualized instruction tailored to individual student needs. Donovan (2013) examined differentiated instruction through guided math in a fourth grade classroom. The results of this study show an increase in student motivation and achievement on multi-digit addition problems, multi-digit subtraction problems, and identifying landmark data. Garrett and Hong (2016) examined the impact of small group math instruction on language minority kindergartners. The results of this study indicate that small-group differentiated instruction is highly beneficial to English language learners in a kindergarten setting. The researchers specified that the students’ assessment results show that this particular group of language minority kindergartners responded better to heterogeneous grouping. Swing and Peterson (1981) examined student ability and student behaviors during small group interaction in a fifth grade math setting. The results of the study suggested that on-task small group interactions fostered the achievement of both high and low ability students. John, Joseph, and Sampson (2014) looked at the effect of differentiated math instruction training on teachers’ ability to meet the needs of students. The findings of the study uncovered that teachers felt more prepared and confident in their abilities to meet their students’ diverse needs.

Guided math instruction allows for a certain amount of flexibility in the classroom. There are many different methods for implementing guided math in the classroom, and it can be adapted across a wide range of grade levels. In his research, Donovan (2013) discussed the value of using data and assessment to flexibly group students into small groups. The groups can, and should, change throughout the year. Benders and Craft (2016) explored the effect of guided math groups on the math achievement of first grade students. The researchers found that students had tremendous growth based

on the results of the pre-test and post-test. While the unit of study featured in this action research project involved all of the teacher's first grade class, she chose to focus on her lower performing students. She argued that no two children with difficulties in math are the same; however the intervention of introducing guided math allowed her to "identify and target individual student's particular difficulties." (p.6).

Fielder (2013) looked at the effect of implementing guided math in nine different Title 1 schools by analyzing GCRCT (Georgia Criterion Referenced Competency Test) scores. While the study was unable to show statistically significant changes in test scores, the researchers uncovered implications regarding guided math and minority students. The study suggests that guided math holds an element of cooperative learning that is person-centered. Fielder (2013) found that this aspect of the guided math framework is proving to be beneficial to minority students as well as students who are economically disadvantaged. The research suggests that, "Guided Math is working to close this achievement gap in ... mathematics among African American and Hispanic/Latino students as well as economically disadvantaged students" (p.85).

Currently there is not a large body of research dedicated to guided math. While there are a few studies that looked at the effectiveness of guided math in terms of student achievement, there are no studies to date on the perceptions that students, teachers, or parents have about guided math. This study will help to fill the gap in research by being both about guided math, as well as focused on the perceptions of various groups. It is important to understand not only if a program is effective in helping students achieve, but also to understand how that program is perceived by students and teachers as well as how that program impacts students' perceptions of themselves as learners. This study will help to shed some light on the latter.

What I Did

In this action research study, I used surveys, interviews, and observation data to uncover my participants' perceptions of guided math. This study was conducted in a first grade classroom during

my year-long clinical teaching placement. Being with my students for a full year gave me a chance to get to know my students and build relationships with them before conducting this research study.

Participant Selection

The participants of this study included myself, my cooperating teacher, all students in a single first grade class who had parental consent and gave assent to participate, and the parents of these students who had also given their consent to participate.

Our first grade class was made up of 20 students. Of our 20 students, 10 were boys and 10 were girls. The class demographics included the following: eight white students, four students who identify as two or more races, four African American students, and three Hispanic students. One student was repeating the first grade. Three students were pulled daily for reading intervention. One student was going through the RTI process, but was slowly phased out of the process.

An information letter was sent home with each student along with a consent form for a parent or guardian to sign for their child to participate in the study, as well as a consent form for their participation in the study. After obtaining parent consent, students signed an assent form to agree to participate in the study. Every student receiving consent and assenting to the study participated in math class and observations and was given a survey at the start of the study. The parents of my students who consented to participate were also surveyed. After reviewing my students' survey responses, I selected six students to interview. I chose these students based on their survey responses and took into consideration the demographics of the class in order to obtain a reasonable representation of students in my class. Lastly, I interviewed my cooperating teacher over the subject of guided math and her experience in teaching math using this approach.

Data Collection

This study is a mixed methods action research study, utilizing both qualitative and quantitative data. I sent out surveys to all of my students' parents who agreed to participate in this study. I gave a separate survey to all of my students who agreed to participate. I made use of surveys because "they

are a simple way to collect data on large groups of participants” (Hendricks, 2016, p. 97-98). I used the results of the student survey to select six students to interview. I chose two students to interview whose surveys showed that they were not responding well to guided math instruction, two students whose surveys showed that they were responding somewhat neutrally to guided math instruction, and two students whose surveys showed that they were responding well to guided math instruction. Student interviews lasted from 5-10 minutes.

I also interviewed my cooperating teacher. This interview lasted around 30 minutes. Both the teacher and the student interviews were semi-structured interviews. I also kept a journal of my observations and experiences with teaching guided math. I kept a notepad with me when I was teaching, and when I observed something related to students’ perceptions of guided math I took down a quick note of it. I also took notes on my perceptions of guided math as the teacher. Two or three times a week, over three weeks, I sat down to flesh out these notes and reflected on the events. Three to four times a week, for three weeks, I wrote in a personal journal documenting my perceptions of guided math.

Data Analysis

Observation and interview data was transcribed and analyzed using the constant comparative method with initial coding followed by identifying major categories with supporting codes (Hubbard & Power, 2003). I used this method to uncover themes within the interviews that I conducted as well as within my journal entries. The second type of data analysis that I used in my study was descriptive statistics. I analyzed the surveys by percentages to discover how students and parents are responding to questions as a group. I used this data analysis to take a closer look at the surveys and determine which students to interview. I began by looking at the initial 20% of my data (including survey and interview data) and created initial codes based on reoccurring themes. I created 15-20 initial, or level I, codes (Tracy, 2013). I used these initial codes to analyze the remaining 80% of my research data. From there I selected 3-5 level II codes. I wrote memos to reflect on each of these level II, or parent

codes, (Tracy, 2013). I then created a codebook to detail each level I and II code. The codebook (see Appendix A) includes a definition and example of each code.

What I Found

After a significant amount of time was spent transcribing, coding and analyzing the data I had collected, I found that four main answers had arisen to my research question: How do the students, parents, and teachers in my first grade classroom perceive guided math instruction? The overwhelming response from all participants was positive, as three of my four level two codes encompass level one codes that present advantages to the guided math model of instruction.

Parents’ Perceptions

Parents play a vital role in their children’s education. This role should not be taken lightly. Parents can be an incredible resource for teachers and can provide invaluable information and insight into their children. At the start of my study I sent parent surveys home to all the parents who consented to participate in my study. An example of the survey sent to the parents is included in Appendix B.

Figure 1 is a section of a completed parent survey.

4	I enjoyed math in school. <i>in elementary</i>	1	<i>(2)</i>	3	4	5	6	
5	I regularly talk to my child about school.	<i>(1)</i>	2	3	4	5	6	
6	It is important that my child does well in school.	<i>(1)</i>	2	3	4	5	6	
7	I felt successful in math when I was in school.	1	2	3	4	5	<i>(6)</i>	<i>High School</i>
	Math was taught differently for my child last							

Figure 1. Completed parent survey.

Most of the parents who completed one of these surveys simply indicated their answers for each question by marking the appropriate Likert Scale option. The example above is the one exception to this. This parent chose to specify her response by writing a note. She stated that she enjoyed math in elementary school, but lost that later on. She also specified that by the time she was taking mathematics courses in high school, she no longer felt successful in math. I appreciate that she took the time to explain her answers, and I wonder if many of the other parents would say the same. I also

wonder how I, as a teacher, can instill a life-long love of math in my students as well as a confidence in their mathematical abilities.

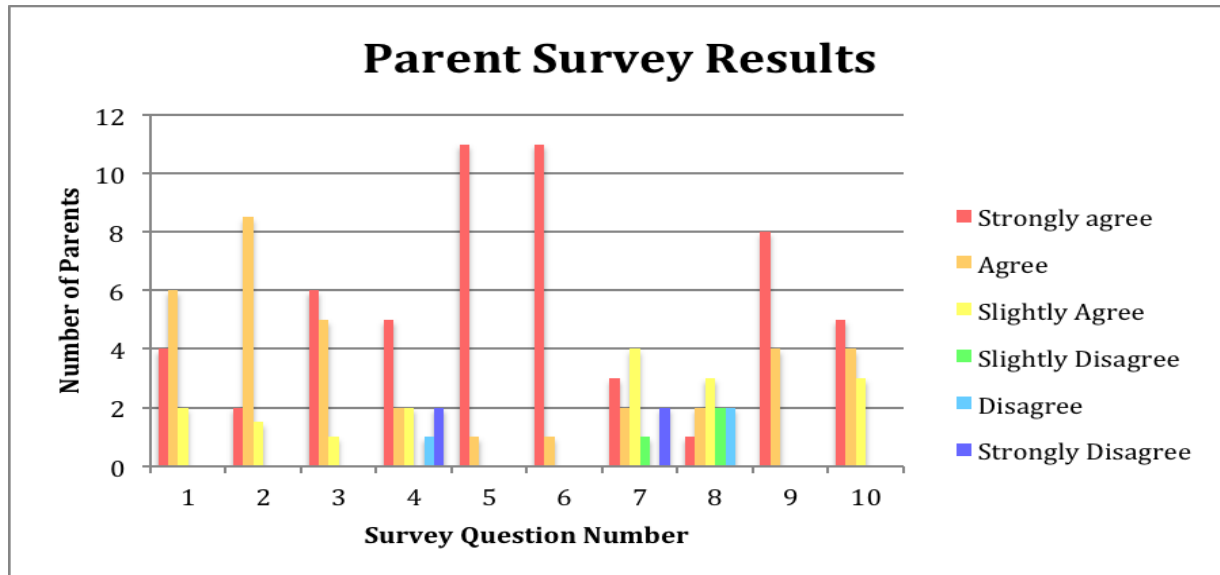


Figure 2. Graph of parent survey data.

Figure 2 displays the Likert Scale data pulled from all of the parent surveys that were returned to me. The first three questions, as well as question 10, had to do with how the parents perceived their child’s experience with math in first grade. I was excited to see that every participating parent agreed to some extent that his or her child was enjoying math, felt successful, and was making progress in math. The fourth and seventh question, which had to do with the parents’ own personal experience with math, had more mixed reviews. Questions five, six, and nine were targeted towards the parent’s involvement in his or her child’s education. Nearly every parent strongly agreed to the statements that they talk with their child about school, want their child to do well, and feel involved in their child’s education.

Students’ Perceptions

The findings of this study show that most students enjoy guided math. It is also true that students who enjoy math in general are more likely to enjoy guided math as well.

I would like to make a note that my students were allowed to choose their own pseudonyms. No names were suggested by the researcher, and no names were discouraged.

The survey that I gave to students is included in Appendix C. Over half of my class said that they strongly agree to the statement of “I like math”. Only one student disagreed to the statement, and no students strongly disagreed.

I was also glad to see that over half of my participants felt strongly in agreement to the feeling of being good at math (see Figure 3). I was sad to see that one of my students responded very negatively to this question, however. I will discuss this particular student in later sections, as he is one that I chose to interview.

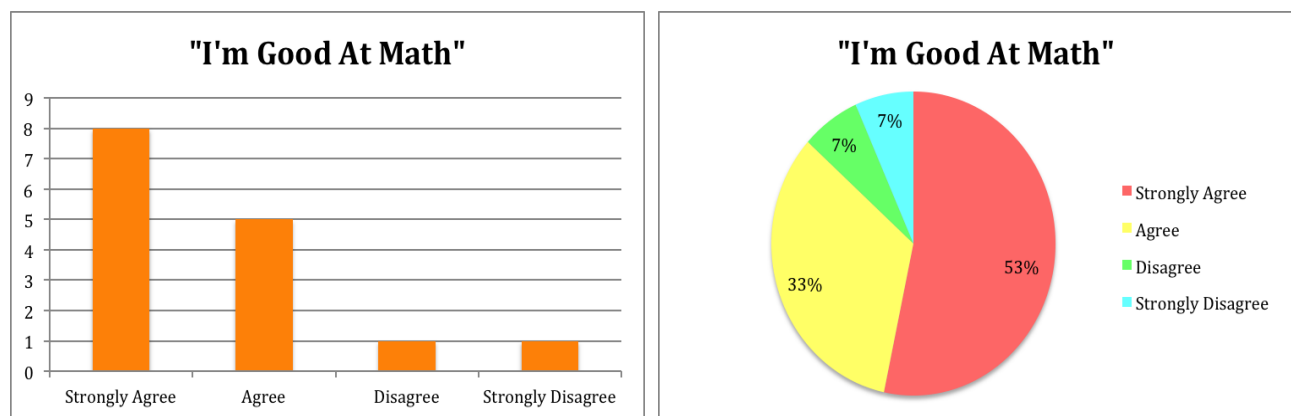


Figure 3. Graphs of second student survey question.

Most of my student participants strongly agreed that they enjoy learning math in a small group (see Figure 4). I was happy to see that most of my students were happy with the way that we are learning math in our classroom. The two students who strongly disagreed with this question were chosen to be interviewed.

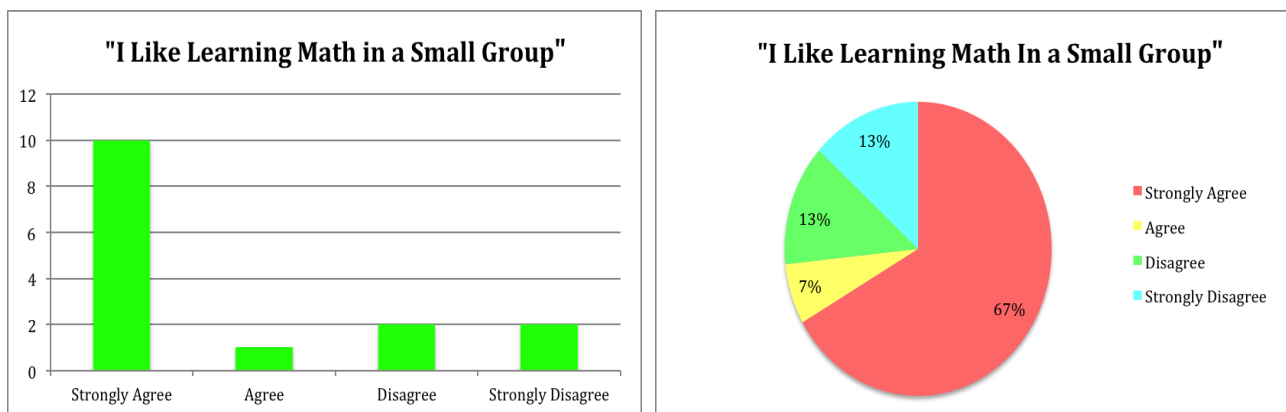


Figure 4. Graphs of third student survey question.

The fourth and final question had the most interesting results (see Figure 5). My class was much more divided on their preference of learning in a large group over a small group, with nearly half stating that they strongly agree, and nearly half stating that they strongly disagree. I wondered about this question after giving the survey to my students. I thought that maybe some of them were unclear about the wording or the implication of the question, because quite a few answered positively for learning in a small group but then also said they would rather learn math in a large group.

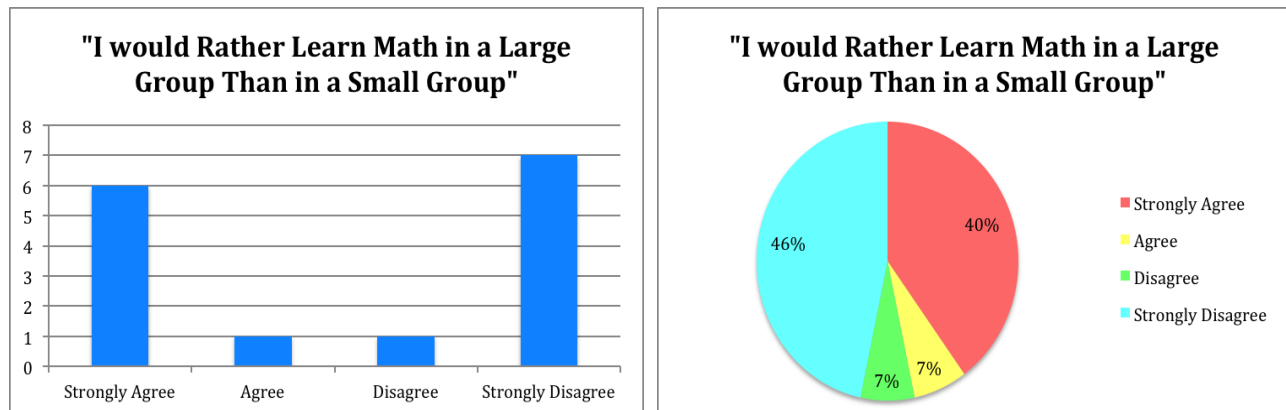


Figure 5. Graphs of fourth student survey.

Students selected for interviews. The following section includes data collected from the six students that I chose to interview. I chose these students mainly based on the results of the student survey. I also thought about how comfortable each student would be doing an interview, as well as the demographic makeup of our classroom. Included in this section are the surveys completed by each student, as well as a picture that I asked each student to draw to begin our interview. I asked each student to think about what math looked like in our classroom and then to draw what he or she were picturing. They were allowed to use whatever drawing materials they wanted. All but one chose to draw with a pencil. One student chose to add color to his picture.

The first student I chose to interview was May. On her survey she answered, “strongly agree” to every question. I wondered what she was thinking about, especially on the last two questions. She said that she loved learning math in a small group and that she would rather learn math in a whole group. During the interview I found that she was a little bit confused. She talked about our guided

reading groups several times during the interview. When asked to talk about her picture she described what each part was, and explained that she was simply drawing the classroom. One thing I noticed about all of the students' pictures was that they all chose to include the Kindles in some way. The second student that I interviewed was Cutie (see Figure 6). Her answers to the survey were much more varied than the first student I interviewed. She had a clear preference on learning math in a large group.

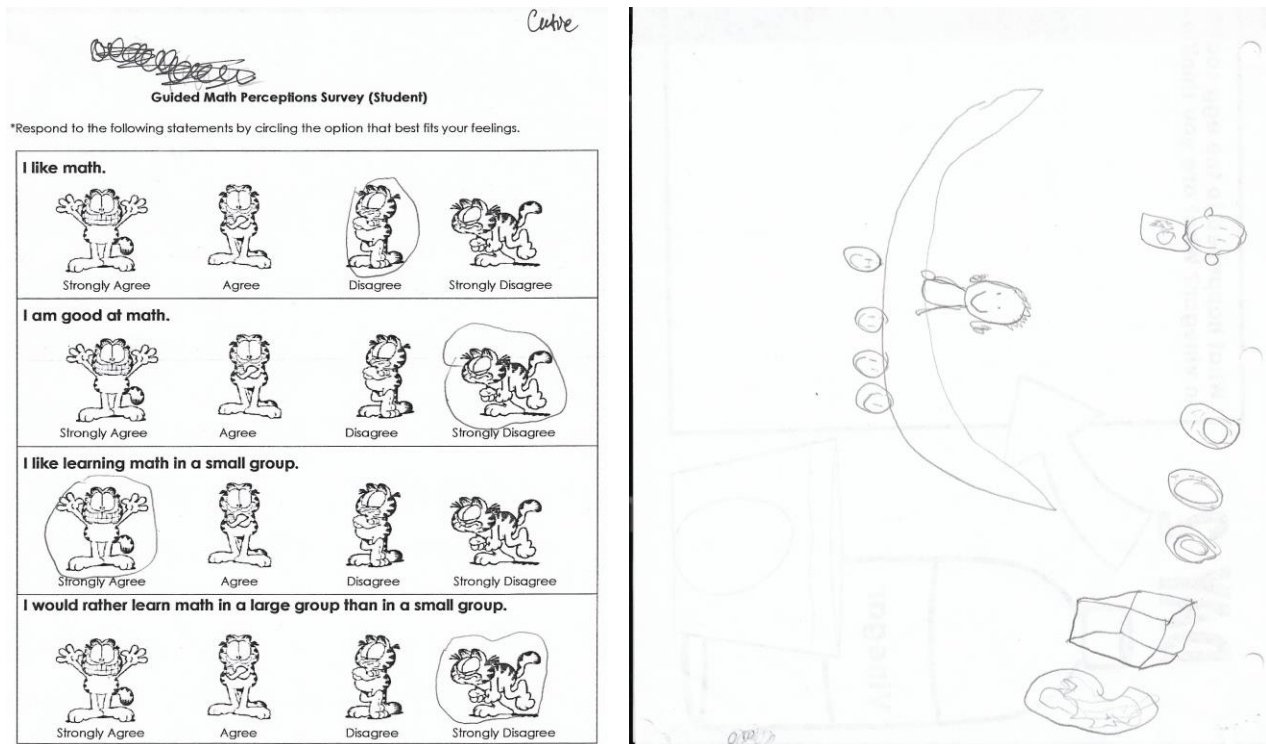


Figure 6. Survey of Cutie (student selected for interview), and drawing done by her during the interview. This is a drawing of what math looks like in our first grade classroom.

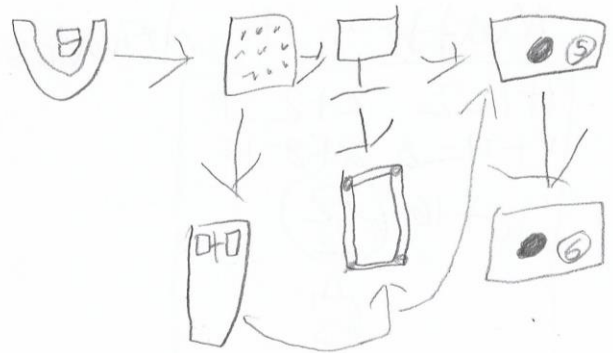
The student whose documents are pictured in Figure 7 had an interesting response to the request to draw a picture. He initially thought I was asking him to show me what math instruction looked like in our classroom. His first illustration is shown in the top right of the above collection (see Figure 7). He told me that when he thinks of math he thinks of patterns and addition. Then I changed my question slightly and directed his illustration towards our guided math rotations.

*Respond to the following statements by circling the option that best fits your feelings. Juber

<p>I like math.</p> <p>Strongly Agree Agree Disagree Strongly Disagree</p>
<p>I am good at math.</p> <p>Strongly Agree Agree Disagree Strongly Disagree</p>
<p>I like learning math in a small group.</p> <p>Strongly Agree Agree Disagree Strongly Disagree</p>
<p>I would rather learn math in a large group than in a small group.</p> <p>Strongly Agree Agree Disagree Strongly Disagree</p>

Math + Atividades :-
 $1+1=2$ $2+2=4$
 $4+4=8$ $8+8=16$
 $16+16=32$

 64



how you know

Figure 7. Survey of Juber (student selected for interview), and drawing done by him during the interview. This is a drawing of what math looks like in our first grade classroom.

As I stated above, through my data analysis I was able to uncover four level two codes for the seven interviews I conducted. I have decided to break up my data by participant groups. This section is devoted to the data collected from student interviews.

Having options. The first level two code that I am discussing encompasses four level one codes: We Make Things, We Play Games, We Get To Talk, and The Importance of Choice. This code developed as I saw how important it was to both the students and the teachers that we all have choices within the guided math framework. Every group is able to participate in each station of guided math. Having small groups at the teacher table opens up a lot of options for both students and teachers. The following was pulled from a student interview:

K – What about those different things makes you happy? That you are not doing the same thing in math every day, or at every rotation. Why is that fun?

C – Umm because we don't have to do it over and over and over again...

The student enjoyed the fact that there is variety in our math instruction. She also liked that we are not spending our entire block of math instruction time working on the same activity. This sentiment was shared by all of the students that I interviewed.

Math makes me feel. What better way to understand a person's perception of something than to ask them a simple, yet powerful question: How does that make you feel? This level two code encompasses three level one codes: Math is Fun, Math Makes Me Happy, and Too Much Work Makes Me Cranky. The following was pulled from a student interview:

K - How does math make you feel?

B - ...Happy.

K – It makes you feel happy, ok. Why does it make you happy?

B – Because... there is a lot of fun stuff with math to learn about.

K – Ok, so you enjoy the kinds of things that we are learning about in math, ok. Is there something else about math that makes you happy?

B – Learning.

K – Ok, you love learning? Well I am glad that you love learning and you love math, that's awesome. I love math too.

This student's response to the question, "How does math make you feel" was shared by all of the students I interviewed in some way. I was so excited when I conducted my first student interview and I heard my student's response to this question. Math makes me happy, she said, because she loves learning new things. Wow! That made my teacher heart so happy to hear.

For the love of learning. In different ways, through surveys and interviews, my students showed me that they were also developing a passion for new knowledge and growth. They sought out

challenges and didn't shy away from hard work (although they do admit that too much work can make them cranky). They invited change and novelty into their life and sought new experiences through games and interactions with their peers. One of my favorite conversations on this topic came from an interview with one of my students:

K- So even though you feel like you aren't good at math you still like math?

E - *nods head yes*

K – Ok, so why do you like math?

E – Because you get to because I get to learn and I don't know stuff that I just know now.

K – Ok, so do you feel like you are learning more and you are getting better at math as we go?

E – *nods head yes*

K – Well that's good! I'm glad you feel like you are learning something. So maybe, if I were to give you this (survey) again sometime then you might feel like you are better at math then you were before. I'm glad that you like math still and you are still liking that you have to work hard.

On his survey this student indicated that he liked math but that he didn't feel like he was good at math. I asked him how it is that he liked something that he didn't feel good at. His response was heart warming and inspiring. He was not afraid of a challenge and was willing to work hard in order to learn new things.

The struggle is real. For most of the students I interviewed the most challenging part about guided math was not being able to get help from the teacher when she was teaching a lesson to her small group. Students can struggle with working through an activity. Another issue that came up for several students was problems with technology. At the beginning of the school year my cooperating teacher applied for, and received, a grant for five student Kindles. While these Kindles were a

wonderful asset to our classroom, they also presented some challenges. One student explained the difficulty she faced with the Kindles:

K - Okay, and what about the Kindles do you not like, that you would want to change them?

C – Well people download things and then everybody wants then people want to go get on the my town in our group because there are only two different my towns.

K – Ah okay, so people aren't really using the Kindles the way that they were supposed to and now they fight over it because different Kindles have different things on them.

C – Yeah...

K - So why did you decide to draw the Kindles?

B – Because we do math stuff on the Kindles, like first grade math.

K – And umm, do you enjoy using the Kindles when we have math?

B – Kinda...

K – Okay, so why only kind of?

B – Because they mess up. And there's not a lot of things to pick.

Teachers' Perceptions

In order to answer my research question, I needed to gain insight into the perspectives that a teacher has on guided math instruction in the first grade classroom. In order to do this I conducted an interview with my cooperating teacher, and I kept a reflect journal over the course of my data collection period.

While I previously stated that through my data analysis I uncovered four main level two codes, the data collected from my teacher interview only contributed to three of the four. The fourth code, "Math Makes Me Feel", emerged from student interviews and comments made in class.

Math makes me feel. Through my journaling I did not personally make a response that added to this level two code, but I did take note of students' comments that were made throughout the course of the study. Here is a snippet from one of my journal entries:

Journal Feb. 13th - In two different small groups I had a student say that the activity was fun. One student (DJ) shouted, "Wow! This is so much fun!" Another student (Jack) exclaimed, "This is so much fun! I love math. It is my favorite time of day."

Having options. Choice is a strong motivator for students and teachers alike. With a small group at the table we can create things, and we can play games as a group or with partners. Students have a chance for their voices to be truly heard, and their teacher is able to fully listen to their thoughts. The following is a quote taken from the interview I conducted with my cooperating teacher:

"They have choices, they're not doing the same thing the whole time, and that – that math block you know is quite lengthy, but they are not sitting there doing worksheets the whole time."

Learning is valued and embraced when a person is allowed to take ownership of his or her education. Choice gives both students and teachers the freedom to make the learning their own. They are able to work together to build knowledge and do so on their own terms. I have seen, through the eyes of my students, how important it is for them to have even a small amount of control over what they learn and how.

Guided math allows for a lot of freedom for both students and teachers. Students can have an opportunity to play a game with their peers and at the same time their teaching can have an opportunity to scaffold their students' learning through play.

For the love of learning. Throughout the data collection and analysis process of this research progress I noticed a common thread emerging. There seemed to be a connection between the perceptions of parents', students', and teachers' when it came to learning math within the guided math

curriculum. As I dug a little deeper I saw that there was an inherent love for learning inside of everyone. My cooperating teacher and myself both separately uncovered a thirst for knowledge that stemmed from self-reflection. We believe that learning is a life long endeavor that you are never too old to be a part of. The following section pulled from my teacher interview provides a wonderful example of this sentiment:

K – Definitely. Okay. So, I know that you have just done it in first grade, but do they do guided math in the older grades also? Do you know of other teachers who are doing it?

F – Yes, yes I do. In fact umm when I started to umm re-group my-my-my brain... wrap my head around guided math I actually went to a fi- a second grade teacher in this building because she had been doing it and honestly I went and watched her and I asked lots and lots of questions. So, you know it... just because uh I'm a veteran teacher and I've been teaching for a long time doesn't mean I have all the answers and certainly doesn't mean that I am too old to learn how to do something a better way. And umm she's a little bit younger than me, and like I said I did I went and watched her, I took notes umm I in fact I, and I asked her do you mind if I talked to the kids? "No", that was fine. So I even asked the kids, the second graders, some questions about what they were doing, what were they going to do when they were finished with that. Umm how did they know what to do, umm you know all kinds of questions that I wanted to know as a teacher because I wanted to be able to teach my students how to be independent when they're not at the small group table with me. So I had lots of questions, and umm... so yeah I definitely asked for some help from her.

I believe that learning is a life long endeavor, and I hope that I will be able to instill a love of learning in my students. Guided math has a wonderful method for creating opportunities for learning and reflecting on the part of the teacher. I love that guided math starts each unit with a pre-test:

Journal – Feb, 8th Overall I am a big fan of pre-tests. They make it easier to differentiate instruction in the math classroom. Today I gave my students the pre-test for our new math unit on coins! Pre-tests are just one of the things that I love about guided math. It is exciting to me to be able to find out what my students know before we begin a unit. I have a few students who do not like to be unsure of them selves; for these students, pre-tests can be a bit uncomfortable. However, I assure them that it is okay to not have all the answers, and that I do not expect them to know what has not been taught.

The struggle is real. This level two code encompasses a surprising number of level one codes. The nature of this code is to allow a second perspective on guided math instruction. This code includes teachers' and students' concerns, issues, and qualms with the current set up of guided math instruction in our first grade classroom. One struggle that came up in both teacher and student interviews was that of time. You have to think about how long to spend on the whole group instruction, how long each round should last, and how to streamline the process of transitions:

Journal Feb. 28th However, for most of my student groups we only had enough time for the first activity. Timing can be a little tricky for me when teaching guided math. Sometimes the whole class lessons takes longer than expected, and sometimes I feel as though I don't have as much time as I need to work with my students that are struggling.

Teachers felt stressed to fit everything in to an allotted amount of time, and students felt the pressure as well. Another issue that came up for teachers and students was technology:

“Umm... I would definitely like to have more reliable umm technology *laughs* for them to you know to use as one of their stations. And one of the frustrating things is when a computer doesn't work, or when a kindle doesn't work. And what do they do and you know it's like it's hard to... It's hard to tell them what to do when something doesn't work like it is supposed to...because I cannot get up and go over there and fiddle with the computer because I am teaching right here. And so I would definitely say more reliable technology.”

Implications for Teachers

The data I collected shows mixed reviews for the guided math framework for math instruction. I will say that the way that guided math was used in this particular first grade classroom is not the only way that guided math can be implemented. There were four other first grade classrooms on our campus. They were all implementing guided math, and it looked different in every single one of those rooms. This just goes to show that no matter how well designed a program may be, there is no “one size fits all” system for instruction. The same way every student is unique, every classroom is unique and teachers should be modifying programs to suit the needs of their current class.

Through my data collection and analysis I have come away with three big takeaways: learning should be fun, choice matters, and listening is never wasted time. I will briefly explain what each of these topics means to me, and this research.

Choice Matters

Choice was a topic that was brought up by both teachers and students. Every single student said, in a way, that they enjoyed have options for their learning. They stated that they liked that they were able to do different activities and that math was not the same every single day. My cooperating teacher also talked extensively in our interview about how important it is to foster independence and that giving students some freedom to be autonomous can make a big difference in that endeavor.

Students need to have some ownership of their own learning and be able to see how they are progressing in their personal goals as well as their academic goals.

Learning Should Be Fun

With twenty-two individual students in a classroom comes twenty-two individual personalities, abilities, interests, and needs. It can be difficult to find the time and the resources to meet the children where they are and take them where they need to go. My cooperating teacher believed that guided math has brought her closer to this goal than other methods of math instruction have in the past. Guided math provides a framework that gives opportunities to have more one-on-one or one-on-four time with students. Small groups are able to create learning together through play, conversations, and individualized instruction. As a teacher I feel like this model allows me to help my students develop their math skills and have fun at the same time. One of the students I interviewed talked about his favorite games that we have played together in small group. He stated that the best is when he doesn't even feel like he is learning but is "just playing a game". To me this was eye opening. Learning does not have to be cut and dry. Learning can and should be fun and engaging.

Take Time To Listen

My final takeaway is that everyone deserves to be heard. Students have valuable opinions and insights about what goes on in the classroom. They need to know that their voice matters and that they have some ownership over what goes on in their classroom and in their school. Every student should feel like they belong in the classroom and that they will be given a chance to be listened to. I learned a lot from the student surveys, and even more from the interviews that I conducted. My students had some great ideas about how to make our classroom more successful and how to make math more engaging for everyone. So, no matter how a teacher has decided to teach math, it is so vital to take student opinions into consideration because in the end the classroom belongs to everyone.

Further Questions

Through my action research study I have learned a lot about the inner workings of a first grade classroom. I have been able to listen to the voices of a variety of people involved in teaching and learning math. I realize that this study is limited in the location and number of participants. I wonder how the findings might have been different if the study were to be conducted in another city or even state. I also wonder how the results might differ if this study were to be conducted in a different grade level. I asked my participants about their past math instruction, but as this was only their second or possibly third year in school, their background knowledge was somewhat limited. I wonder how the study might have been different as a “what works” study in which guided math was freshly introduced to the classroom during the study. As a teacher researcher I know that my pursuit of knowledge will never truly end. That is what it means to be a life-long learner.

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Appendix A

Codebook

Code	Level	Description	Example
Having Options	II	Having options is a big motivator for students and their teachers	“They have choices, they’re not doing the same thing the whole time, and that – that math block you know is quite lengthy but they are not sitting there doing worksheets the whole time”
We Make Things	I	Mentions of creating math “crafts” at the teacher table during guided math	“We did a craft activity called “Build A Bug”... Before we could build the bug we had to figure out how much each part would cost and how much the bug would cost all together. For each piece we had to decide what coins we would need to “purchase” each bug part...”
We Play Games	I	Mentions of games played during guided math	“Oh! That game we were playing, like with the tooth. Well if you do your doubles right you get to get a tooth for your monster.”
We Get To Talk	I	Mentions of having a chance to talk at the teacher table during guided math	“It’s easier to let them all have a turn to say something or to talk about something... because there are just four of them”
The Importance of Choice	I	Mentions of students having the freedom to choose	“My favorite thing about math in our classroom is that it last long, and we have different choices”
Math Makes Me Feel...	II	Mentions of students’ feelings towards math	K - I just want you to tell me about how math makes you feel. C – Happy... K – Ok, can you tell me a little bit more about that? C – That we get to do games at your table and we get to do our work. K – Ok, so it makes you happy. You like the different things that we do?
Math is Fun	I	Student quotes take down during small group	“This is so much fun! I love math. It is my favorite time of day.”
Math Makes Me Happy	I	Students discussing their feelings towards math	K - How does math make you feel? B - ...Happy. K – It makes you feel happy, ok. Why does it make you happy? B – Because... there is a lot of fun stuff with math to learn about.
Too Much Work Makes Me Cranky	I	One students feelings on math	K - ...how does that make you feel? E – Cranky. K - *Chuckles* You feel cranky. Why do you feel cranky? E – ‘Cause it’s a lot of work.
For The Love of Learning	II	Any mention of learning and everything that goes along with it	“When they get it you are right here to cheer that on.”

Assessment drives learning	I	Mentions of the impact of assessment on education	“Pre-tests are just one of the things that I love about guided math. It is exciting to me to be able to find out what my students know before we begin a unit.”
Covering content for diverse learners	I	Mentions of teaching the standards to a diverse group of learners	“And that’s when I thought to myself... “Why... you know, they’re not all in the same place, as far as their math skills. Just exactly like they’re not all in the same place in their reading skills. So why am I not teaching math more like you know more similar to what I’m teaching reading”. In other words small group!”
The learning never ends	I	Mentions of learning being a continuous endeavor	“Just because uh I’m a veteran teacher and I’ve been teaching for a long time doesn’t mean I have all the answers and certainly doesn’t mean that I am too old to learn how to do something a better way.”
Meeting the needs of all students	I	Mentions of guided math helping to meet a variety of student needs	“...guided math really was the way to go, because just like in reading in math they are not all on the same ability level. So, and I just thought that’s the best way I can meet all their needs.”
Collaborative Learning	I	Mention of students working together to create learning	“Because it’s kinda like playing at recess and you have a lot of people to play with”
Ah Ha! Moments	I	Students moments of understanding	“It’s also, it’s also kind of fun to be right here, one-on-one or one-on-four or whatever, when they really <i>get it!</i> For example you know DJ is the perfect example because he’s so vocal. When he gets something he says, ‘Oh! Oh! I see! So there’s a pattern!’”
Teacher attention and feedback	I	Mentions of students receiving individual attention	“I think that my kids feel more successful and probably enjoy math more umm because we do guided math. In that they do have a little bit more immediate feedback from the teacher on every lesson.”
“I love learning new things”	I	Students and their love of learning	“I love math because I love learning new things.”
Seeking a Challenge	I	Students mentioning their desire to be challenged	K - Ok, so are you talking about like really taking a pattern further like this? J – Mmmhmm. Because you have to think really hard about because when I get up to six-teen, to 32. I have to think really hard about how 32 umm 32 plus 32 is. I have to think really hard about that and when I finally get it I can write the answer.
Catching misconceptions	I	Mentions of being able to redirect students thinking	“You are able to see their misconceptions immediately because when you are working at the guided math table with your small group you’ve got four to six kids”
Helping Friends	I	Mentions of students helping their peers	K - How do you figure it out if you’re not sure? B – I ask another person. K – You can ask somebody at your table, that’s good. Are they usually helpful when you ask them? B – Yes. K – Well that’s good. I’m glad they are there for you to ask.

I Get To Learn	I	Mentions of an appreciation for learning opportunities	K – Ok, so why do you like math? E – Because you get to because I get to learn and I don't know stuff that I just know now.
The Struggle is Real!	II	Mentions of problems, concerns and challenges associated with guided math and math instruction	“Sometimes I feel as though I don't have as much time as I need to work with my students that are struggling.”
Fostering independence	I	Mentions of teaching students to be successful in meeting their own needs	“Teach that independence so that they don't come up here all the time and want you and want your attention or need your attention”
The first grade mind	I	Mentions of developmentally appropriate learning	“Or are they, you know sometimes they are first graders. Are they seeing how many trips they can make to bathroom, or the water fountain, and walking by the computers to see what their friends are doing?”
“Sometimes you just have to let it go”	I	Mentions of being flexible	“But that's the hardest thing, is just to see something going on that sometimes you have to let go because what you are teaching is right here at your table.”
It all just depends	I	Mentions of factors that can affect learning	“You know it can depend and that's with all students. So... It depends on the kid, and the day, and *laughs* and the weather, and who knows what else.”
Does not compute	I	Mentions of problems with classroom technology	“I would definitely like to have more reliable umm technology *laughs* for them to you know to use as one of their stations. And one of the frustrating things is when a computer doesn't work, or when a kindle doesn't work.”
“It get's too loud”	I	Mentions of student noise level becoming a problem	“The problem is it gets noisy. It gets so noisy because when you let you know one or two groups of kids to talk or play a game it just gets louder and louder and louder and so you know I typically try to keep my math trays you know as a single as a single person, somebody working on their own.”
It's what's “goes on out there”	I	Discussion of the difficulty of keeping a focus on the small group lesson	“Cause what happens here at the table and the...and the - the learning that's going on here, I don't have a problem with that. I have control over that and I think it's great and I'm glad to be able to teach in small group, it's just what goes on out here.”
Staying on Task	I	Mentions of students' difficulty with staying focused on their work	K - What do you think your students struggle with the most with guided math? F – Staying on task. You know because if they're... I mean you know I've got some that when they are doing that journal activity... uhh... you know they're - they're more interested in what uh what game somebody else is playing.
Short On Time	I	Difficulties do to a limited amount of time	“Like some of the like uh whenever you have two papers and I don't have enough time.”

<p>I Keep Messing Up</p>	<p>I</p>	<p>One student's frustration with math</p>	<p>K - Ok, you really like math that's great, but then here you said you don't feel like you're good at math. Why do you not feel like you are good at math? E - I don't because I like I keep on messing up.</p>
<p>Learning To Get Along</p>	<p>I</p>	<p>The social aspect of the classroom</p>	<p>K - And what can you do if you are not sure what to do? E - Raise your hand. K - Ok, you raise your hand. Ok, but what if the teacher is working at her table? What can you do then? E - Ask a person? K - Ok, ask somebody at your table? Do you do that sometimes? E - Yes...but nobody helps me!</p>

Appendix B

Guided Math Perceptions Survey (Parent)

















*Respond to the following statements by circling the option that best fits your feelings.

		Strongly Agree	Agree	Slightly Agree	Slightly Disagree	Disagree	Strongly Disagree
1	My child enjoys math.	1	2	3	4	5	6
2	My child feels successful in math.	1	2	3	4	5	6
3	I feel that my child is progressing in math.	1	2	3	4	5	6
4	I enjoyed math in school.	1	2	3	4	5	6
5	I regularly talk to my child about school.	1	2	3	4	5	6
6	It is important that my child does well in school.	1	2	3	4	5	6
7	I felt successful in math when I was in school.	1	2	3	4	5	6
8	Math was taught differently for my child last year.	1	2	3	4	5	6
9	I feel involved in my child's education.	1	2	3	4	5	6
10	I feel that my child is doing better in math this year.	1	2	3	4	5	6

Appendix C

Guided Math Perceptions Survey (Student)

*Respond to the following statements by circling the option that best fits your feelings.

I like math.			
			
Strongly Agree	Agree	Disagree	Strongly Disagree
I am good at math.			
			
Strongly Agree	Agree	Disagree	Strongly Disagree
I like learning math in a small group.			
			
Strongly Agree	Agree	Disagree	Strongly Disagree
I would rather learn math in a large group than in a small group.			
			
Strongly Agree	Agree	Disagree	Strongly Disagree

Appendix D

Interview Protocol (Teacher)

1. Think about how you plan, set up, and implement Guided Math and walk me through that process.
2. What is your favorite part about Guided Math? Why?
3. What is the hardest part about Guided Math?
4. How did you teach math before you starting doing Guided Math?
5. How is Guided Math different than other approaches to math instruction?
6. Does Guided Math look different in older grades? Younger grades? How so?
7. What made you choose to start using Guided Math?
8. If you could change anything about Guided Math what would it be?
9. What do you think your students struggle with the most during Guided Math?
Why?
10. How do you think your students feel about Guided Math? Why?
11. Is there anything else that you would like to tell me about Guided Math?

Appendix E

Interview Protocol (Student)

1. Talk to me about how you feel about math.
2. Think about a time when you were in a small math group working with your teacher and talk to me about what you were doing.
3. What is your favorite part about our Guided Math groups? Why?
4. What was your favorite math lesson this year? Why?
5. Think about how you learned math in kindergarten. Was it different from how we learn math in first grade? Talk to me about that.
6. What is the hardest part about Guided Math Groups for you? Why?
7. If you could change anything about our Guided Math Groups, what would it be? Why?
8. What else can you tell me?