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Questioning Techniques that Increase Student Engagement

During the Mathematics Lesson

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Submitted in partial fulfillment
Of the requirements for the degree of
Master of Education
Moravian College
Bethlehem, Pennsylvania
2018

Abstract

This study examined the observed and reported experiences of 17 students in a second-grade classroom when interacting through questioning techniques to promote student engagement during the mathematics lesson. In order to promote different levels of engagement, the teacher focused on one section of the school day and introduced three different questioning techniques over a course of three weeks. The questioning techniques Cold Call, Wait Time, and Call and Response were driven from Doug Lemov's Teach Like a Champion 2.0 (Lemov, D. 2015). The data suggests that when students were given more wait time their responses had more in-depth answers and more students participated because they were given a chance to think about their answer. Cold call, required the students to be constantly on their toes and interested in the lesson because when using the app Class Dojo, they wanted their name to be randomly chosen so they could receive the points when they were called on. Lastly, call and response was the students favorite questioning technique because they synergized to develop a hand signal in which they could scream out the answer all at once! Questioning techniques were a great implementation to the math lesson and the exposure allowed for these strategies to be used throughout the entire school day for an even greater level of student engagement!

ACKNOWLEDGEMENTS

I would like to thank my incredible parents for believing in me. They have supported me in everything that I do and I can't even tell them enough how blessed I am for their continued support. They encouraged me to be a teacher and take my gifts to the world of public education.

Thank you to my brother, who is my best friend. Even though he is my little brother I look up to him more than anything. He has inspired me to reach my goals and never give up on my dreams.

I would like to thank a special friend and coworker that has come into my world at probably one of the hardest and most stressful times of my life. He has guided me, supported me and pushed me to do the best I can. Whether it was dealing with me for hours on end at work, covering me so I can be at school, or just being there as my go to person. He has given me the encouragement to finish out my Master's Degree while working three jobs and still trying to focus on myself. I am forever grateful for his friendship and guidance. I hope I can support him one day in his education career as he has done for me!

Thank you to my students for allowing me to implement these questioning techniques in the classroom and providing the opportunity us to grow academically, each and every school day.

To my knowledgeable professors at Moravian College who have challenged me, made me leap out of my comfort zone and jump into the action

research experience with two feet! I can't thank you enough because this was a very rewarding process but yet quite rigorous as well. Thank you for supporting me in accomplishing this goal!

Table of Contents

ABSTRACT	ii
ACKNOWLEDGEMENTS	iii
LIST OF FIGURES	xi
RESEARCHER'S STANCE	1
LITERATURE REVIEW	5
Introduction	9
Student Engagement	10
Student Centered Learning in a Question Rich Classroom	13
Student Centered Learning in the Mathematical Classroom	15
Convergent vs. Divergent Questions	16
Questioning Techniques	17
Questioning Technique: Cold Call	19
Questioning Technique: Wait Time	21
Questioning Technique: Call and Response	23
Questioning Techniques in Mathematical Classroom Discourse	26
RESEARCH DESIGN AND METHODOLOGIES	30
Research Goals	30
Setting/Participants	30
Rationale	31

Data Collection	31
Student Engagement Survey	32
Rubric	33
Formative Assessments through observation	33
Open Response Survey : Favorite and Least Favorite Thing.....	34
Favorite Questioning Technique	34
Field Log	35
Trustworthiness Statement.....	35
MY STORY	38
Student Remarks	38
Time to Take Action	39
Planning Time	40
Week 1: Student Engagement Survey	41
Week 2: Questioning Technique #1 Wait Time	42
Week 3: Questioning Technique #2 Call and Response	44
Week 4: Questioning Technique #3 Cold Call	47
Week 5: Wait Time, Call and Response, and Cold Call	50
Week 6: POST Student Engagement Survey and Favorite Technique ...	51
DATA ANALYSIS	52
Introduction	52
Pre and Post Student Engagement Survey	53

Weekly Formal Observations	60
Wait Time	62
Open Response: Favorite and Least Favorite Things	63
Favorite Questioning Technique Survey	64
Codes	66
Bins	67
THEME STATEMENTS	67
The Effects of Questioning Techniques on Student Engagement.....	67
How Survey's Drive Lessons and Instructional Routines.....	68
The Effects of Inquiry through Exploration and Questioning.....	69
The Effects of Zone of Proximal Development and Wait Time have on Student Achievement	70
LOOKING INTO THE FUTURE	72
REFERENCES	74
APPENDICES	78
A. Pre and Post Student Engagement Survey.....	78
B. Open Response Survey : Favorite and Least Favorite Thing.....	86
C. Favorite Questioning Technique – Checklist.....	87
D. Rubric - Teacher Designed Rubric.....	88
E. Consent Forms.....	89
a. HSIRB.....	89

b.	Principal Consent Form.....	90
c.	Parent Consent Form.....	91
d.	Student Participant Consent Form.....	92

LIST OF FIGURES

4.1: Calendar - Time for a Plan (Unit Outline of Research).....	45
5.1: Survey – How do you feel about school?	59
5.2: Survey – How do you feel about being in Second Grade in Room 110?	60
5.3: Survey – How do you feel about being called on?	61
5.4: Survey – How do you feel when students call out?	62
5.5: Survey – I feel comfortable raising my hand and I enjoy participating.....	64
5.6: Survey – Wait Time vs. No Wait Time	66
5.7: Student Responses : Favorite and Least Favorite Things	67
5.8: Survey – Favorite Questioning Technique.....	69
5.9: Codes	70
5.10: Bins	71

RESEARCHER'S STANCE

Growing up I knew I always wanted to be a teacher. From a young age when everyone asked what they wanted to be when they grow up, I never hesitated to state that I wanted to be a teacher. My greatest role models in my life were my parents and some of my teachers. I knew I wanted to make an impact on others' lives, the way that these influential people did on mine. It took a lot of determination, hard work and never giving up to get where I am today. From student teaching in Central Pennsylvania with the Mennonite and Amish community to my first placement in South Side Bethlehem and now at Freemansburg, it has been quite the culture shock walking down the path of the unknown. Most importantly it has been a learning experience that I am forever grateful for. I am currently in my sixth year at Freemansburg as a second-grade teacher and I never know what the next day will bring me. My students are the reason I come to school every day with a smile on my face, the reason I got the nickname Miss K, and they are the reason why I always have to be on my toes no matter what else may be going on. It always makes for exciting times as I prepare for the new day that is ahead!

My second graders are rowdy, rambunctious, and loving individuals who are constantly seeking for my full attention. Each of my 17 students has specific interests, needs, and learning abilities, making them all unique and special in their

own individual way. It has taken many trials and errors to find techniques and learning strategies that work for most of my students but unfortunately when I finally feel like I have met their needs through instruction and strategies, the year is over and I am preparing for a whole new set of children with different needs than my last.

Freemansburg is a Title 1 school that has 80% or more of its students coming from economically disadvantaged homes, who are receiving free and reduced breakfast, lunch and a snack on a daily basis. The needs from home and the resources that are not available to them carry over and contribute to their levels of success in the classroom and the behaviors that are shown during the school day. My students have been my driving force for my action research and my goal is to strive to find some techniques that I can carry on year after year, that would motivate, engage, and encourage each and every one of them to be attentive, and actively participate in our class discussions. My driving thought was how do I get all students with different abilities, needs, and learning styles be engaged and motivated in the lesson and still be successful year after year!

The world of teaching, technology, and education, is ever involving and students are immersed in ways that are unlike anything educators have seen in the past. It is obvious that students live in a world that engages them differently because they are prominent figures in a technology rich society. As educators, we must better understand the youth, as they have different needs, goals, and learning

preferences as a result of their technology rich upbringing. We have to determine how to best engage them in learning and meet their needs as they are growing up in a digital world and are heading into different cultural and economic futures rich in the ever-advancing technology and information. This is where teachers and educators may need to think outside of the box because this culture is one that many of us are not quite as familiar with.

The foundation of my young participatory action research was built by the powerful, engaging and easy to implement teaching techniques presented in Doug Lemov's text Teach Like a Champion 2.0 (Lemov, D. 2015). Since this book has so many outstanding techniques I decided to focus in on one area; building ratio through questioning. What are the observed and reported experiences of a second-grade teacher and seventeen students interacting through questioning techniques to promote student engagement and improve academic success in the mathematics lesson? Through this research I hope to observe how questioning and discussion techniques are effective instructional methods that develop participation and increase daily classroom interactions. My practice will be enhanced, as I will be implementing a total of three techniques to my students to help aim for success. Cold Call, Wait Time, and Call and Response will be my three techniques that will be implemented throughout a 4-week Math Unit on shapes, blocks and symmetry.

To help understand the levels of participation in my second-grade classroom, I developed a student engagement survey that I will give the students in the very beginning of the math unit to see where they feel their levels of engagement and attentiveness are during this time of day. The survey was orally read to the students and they circled in one of the five smiley faces that is provided. This key allows for my students to have a clear and visual picture of how they are feeling about that specific task.

Secondly, I will be observed by one of my colleagues, once a week performing each of the three questioning techniques. She will be positively critiquing me using a rubric that I created. Next, students will receive a checklist of which their favorite technique was and I will be randomly interviewing students to have them explain to me why that was their favorite technique. Lastly, I will have the students take the same exact student engagement survey at the end to see how student engagement was increased over the course of the math unit.

My end goal with these techniques is to drive student engagement, increase participation, exert effort in all my students, so that they will not give up, and use my words and tone to communicate with my students in a positive way.

LITERATURE REVIEW

Student Centered Learning can be credited as early as 1905 to Hayward and in 1956 to Dewey's work. Theorists like John Dewey, Jean Piaget, John Diamond and Lev Vygotsky, whose collective work focused on how students learn, have informed the move to student-centered learning. Carl Rogers' ideas about the formation of the individual also contributed to student-centered learning. Rogers wrote that "the only learning which significantly influences behavior and education is self-discovered" (as cited in O'Neill & McMahon, 2005, p. 28). Maria Montessori was also a forerunner of student-centered learning, where preschool children learn through independent self-directed interaction with previously presented activities (O'Neill & McMahon, 2005)

Questioning in the classroom has been a critical assessment tool for centuries, and dates back to when Socrates asked questions to his students. Flitz states (2009), "Teaching with questions began with Socrates and has maintained its importance and validity until today. Using this method, Socrates had asked questions to his students, and responded to each question with other questions instead of giving direct information or responses" (as cited in Dos et al., p. 2065). As restated by Sternheimer (2014), the famous Albert Einstein also believed in the power of questioning when he exclaimed, " the most important thing is to not stop asking questions" (as cited in Dos et al., 2016, p. 2065).

In a more contemporary education setting, Mary Budd Rowe was a key figure who coined “Wait-Time” and skillfully implemented in the classroom setting. Rowe believes that periods of silence that followed teacher questions and students’ completed responses -- rarely lasted more than 1.5 seconds in typical classrooms. She discovered, however, that when these periods of silence lasted at least 3 seconds, many positive things happened to students' and teachers' behaviors and attitudes. To attain these benefits, teachers were urged to "wait" in silence for 3 or more seconds after their questions, and after students completed their responses. (Stahl, 1994). Recently, Robert J. Stahl constructed the concept of “think-time.” He states, that the label “think-time” is preferred over “wait-time” because of three reasons, it names the primary academic purpose and activity of this period of silence--to allow students and the teacher to complete on-task thinking. There are numerous places where periods of silence are as important as those "wait-time periods" reported in the research literature and there is at least one exception, labeled "impact pause-time," that allows for periods of less than 3 seconds of uninterrupted silence (1994).

Student engagement has primarily and historically focused upon increasing achievement, positive behaviors, and a sense of belonging in students so they might remain in school. Because the focus was high school completion, research on student engagement targeted students in middle school and high school, where disengagement typically becomes a concern (Williams, Friesen, &

Milton, 2009), and student engagement was seen as a way to re-engage or reclaim a minority of predominantly socio-economically disadvantaged students at risk of dropping out of high school. Over time, student engagement strategies were further developed and more broadly implemented as a way to manage classroom behaviors. More recently, student engagement has been built around the hopeful goal of enhancing all students' abilities to *learn how to learn* or to become lifelong learners in a knowledge-based society (Gilbert, 2007, p. 1). (As cited in Taylor & Parsons, 2011, pg. 4).

The purpose of a mathematics lessons in the classroom is to prepare students to be able to adapt in the changing world, and use this logical basic thinking in their daily life and mindset. To reach these goals there are two visions that are necessary to fulfill the expectations for children today and in the future. According to Sumarno (2005), "the first vision leads to mathematics learning for conceptual understanding and mathematics idea which will be applied in order to solve routine and non-routine, logical, communicative and low and high mathematical thinking. The second vision in more wider definition and leading to the future, mathematics gives logical, systematical, critical ability; developing creativity, habit of working hard and independent, impartiality, discipline, and social attitude; rising self-confidence, sense of beauty to the regularity of mathematics; also developing objective and open-minded needed to face the future which is always changing." (As cited in Saragih & Napitupulu, 2015).

In order to achieve the objective of mathematics learning above, mathematical learning reformation needs to be put in place by means of replacing the learning approach from imitating (teacher centered) to learning with understanding (student centered). In the case of a student centered classroom or “doing math” students are presented with open problems, in which they are expected to collaborate, check, explore, communicate, make conjecture, submit justification and arrange and argument.

According to the student-centered learning approach, knowledge is built by students themselves through exploring situations and real world problems. Teachers are expected more to create learning material that is relatable to the students’ daily life. This would endorse and encourage students to be more engaged individually or in group during instruction. Student's creativity, skill and ability are empowered and developed and the mathematical concept is grasped with greater understanding and with more meaning. (Saragih & Napitupulu, 2005)

A developmental study by Sahat Saragih and Elvis Napitupulu was done with random 7th graders from state and private schools in Indonesia. The purpose of this research study was to develop a student-centered learning model aiming to improve high order mathematical thinking. The intervention that was put in place was that techniques were used to collect data such as giving a high level mathematics thinking ability test, questionnaire, and observation sheet. The test was used to analyze the students’ comprehension in high-level mathematics

thinking ability. The questionnaire was used to know the attitude of the students within the learning process and the observation sheet was used to know the degree of learning model implication applied in the classroom towards the teachers and students activities in the instructional process (2005).

The systematic research revealed that high-level mathematical thinking as a goal of the learning process remains a serious problem. The vision and goals of mathematics education that achieved did not fit what was expected. Teacher, students, method and approach to learning, the mathematics materials, and accommodations all influence the high level of mathematical thinking that is taking place in the classroom. (Saragih & Napitupulu, 2005)

Introduction

With each new school year that comes and goes students with different abilities, needs, and learning styles walk in and out of the classroom. One issue that many educators struggle with is to figure out some teaching methods and strategies that can be used to keep students motivated and engaged in the lesson and throughout the entire school day.

My research question is, “What are the observed and reported experiences of a second-grade teacher and seventeen students interacting through questioning techniques in a student-centered classroom during the math lesson to promote student engagement?”

Student Engagement

Every teacher's goal is to have his/her students engaged and wanting to participate in the lesson. Researchers, educators, and policymakers are increasingly focused on student engagement as the key to addressing problems of low achievement, student boredom, alienation and high dropout rates. The connections between engagement have become so apparent that research has concerned on the construct that academic engagement is a key factor in students' success in school (Fredericks, Blumenfeld & Paris, 2004).

Student engagement has primarily and historically focused upon increasing achievement, positive behaviors, and a sense of belonging in students so they remain in school. Because the focus was high school completion, research on student engagement targeted students in middle school and high school, where disengagement typically becomes a concern (Willms, Friesen, & Milton, 2009), and student engagement was seen as a way to re-engage or reclaim a minority of predominantly socio-economically disadvantaged students at risk of dropping out of high school.

Early studies have defined student engagement as observable behaviors, and often associated this with students' attentiveness and their time on task. However, researchers have more recently begun to include emotional or affective aspects into their definitions of student engagement. Researchers have observed a direct connection between student feelings of belonging, enjoyment, attachment,

sense of security and student investment in their learning (Fredericks et. al., 2011). However, by finding out what the student's interests are, their hobbies, and what gets them hooked in the lesson is just the first piece of student engagement. You want your students to feel welcomed and a part of the curriculum. Hopefully, by bringing in these interests into the lessons, math problems, and daily discussion a greater amount of collaboration and student engagement will be present because their interest levels are already increased.

Over time, student engagement strategies were further developed and more broadly implemented as a way to manage classroom behaviors. More recently, student engagement has been built around the hopeful goal of enhancing all students' abilities to learn how to become lifelong learners in a knowledge-based society (Gilbert, 2007). Student engagement has become both a strategic process for learning and an accountability outcome unto itself.

Williams, Friesen, and Milton's (2009) research found five effective teaching practices to increase student engagement in learning: (1) creating thoughtful, intentional designs for learning; (2) making learning meaningful; (3) building relationships; (4) improving teaching practice in the presence of peer teachers; and (5) using assessment to improve learning and guide teaching.

Students living in this generation need self-directed learning opportunities, interactive environments, multiple forms of feedback, and assignment choices that use different resources to create personally meaningful learning experiences.

Dunleavy & Milton (2009), discuss their findings and address their requirements for what they believe to be intellectual engagement: they agree that it is challenging to pinpoint which classroom practices will be the most effective in supporting student engagement, but they created a list of common instructional designs for learning that begin with the goal of intellectual engagement. These designs include: require high levels of student participations and provide enough time for in-depth and detailed work, connect students with opportunities to develop abilities in critical thinking, intellectual curiosity, reasoning, analyzing, problem solving, communicating, etc., foster collaborations and community building. Inquiry based lessons, and provide a high level of social support for learning and encourage students to take risks, ask questions, and reiterate that it is ok to make mistakes.

Phil Schlecty (1994) states that students who are engaged exhibit three characteristics: First, they are attracted to their work. Second, they persist in their work despite challenges and obstacles. Third, they take visible delight and pride in accomplishing their work. Our goal as educators is to drive student engagement by connecting creative projects to students' personal ideas and concerns, expanding the audience by getting other members of the school or community involved in the lesson, and giving the students more choice so they can express themselves in ways that fits their learning style and personality the best. The theory was expressed best by Strong, Silver, and Robinson (1995, p.

15) “By observing and understanding how classroom conditions can create or repress student engagement, we can gradually move toward a more successful, curious, creative, and reciprocal school system.”

Student Centered Learning in a Question Rich Classroom

In a traditional lecture setting, the classroom teacher is telling the facts, stating theories, lecturing, constantly has the stage; it's a boot like camp atmosphere and very little if any room for collaboration and peer-to-peer interaction is happening. The goal in education, in order to drive success and student engagement, is to move away from this practice and into a more student-centered classroom. This type of classroom is full of listening and questioning, conceptual understanding; the teacher is now the facilitator, inquiry is present, student investigation is ongoing as they are driving the lesson, and the students feel their classroom is a positive, risk free, and inviting setting, where they are comfortable knowing it's ok to make mistakes because we can all learn from them (Harris, 2000).

Student centered learning in a question rich classroom starts with the teacher! This practice means understanding what the participants value, and engaging them in those areas. Student-centered classrooms include students in planning, implementation, and assessments. Involving the learners in these decisions will place more work on them, which can be a good thing. Teachers

must become comfortable with changing their leadership style from directive to consultative -- from ‘Do as I say’ to ‘Based on your needs, let’s co-develop and implement a plan of action.’ (McCarthy, 2015)

Robin Lee Harris (2000, pg. 25) states, “questioning used artfully can transform a classroom from a traditional lecture setting into a lively student-centered community.” An educator’s focus on the craft of questioning will be to develop a classroom environment in which students actively listen, respond freely, and collaborate with each other toward their designated goals. Harris, focuses on questioning techniques in student-centered classrooms. He exclaims, “questions can be used for checking for understanding, starting a discussion, inviting curiosity, beginning an inquiry, determining students’ prior long run, and stimulating critical thinking.” (pg. 28) Within his means of study Harris describes that there are three different kinds of questioning in the student-centered classroom: those that (a) seek knowledge, (b) promote understanding, (c) invite reflection. Questioning takes practice to master, and as we all know practice makes perfect. There is a craft of questioning that involves the synchronization of several elements which include: planning, classroom environment, methods, and reflection.

Student Centered Learning in the Mathematics Classroom

The purpose of mathematics lessons in the classroom is to prepare students to be able to adapt in the changing world, and to use this logical, basic thinking in their daily lives. To reach this goal there are two visions that are necessary to fulfill the expectations for children today and in the future.

According to Sumarno (2005, p.104), “the first vision leads to mathematics learning for conceptual understanding and mathematics idea which will be applied in order to solve routine and non-routine, logical, communicative and low and high mathematical thinking. The second vision in more wider definition and leading to the future, mathematics gives logical, systematic, critical ability; developing creativity, habit of working hard and independent, impartiality, discipline, and social attitude; rising self-confidence, sense of beauty to the regularity of mathematics; also developing objective and open-minded needed to face the future which is always changing.”

In order to achieve this objective, mathematical learning reformation needs to be put in place by means of replacing the learning approach from imitating (teacher-centered) to learning with understanding (student-centered). In the case of a student centered classroom or “doing math” students are presented with open problems, in which they are expected to collaborate, check, explore, communicate, make conjecture, submit justification and arrange and argument.

According to the student-centered learning approach, knowledge is constructed by students themselves through exploring real life situations and real-world problems. Teachers are expected to create learning materials that are relatable to the students' daily lives. This would endorse and encourage students to be more engaged individually or in group during instruction. Student's creativity, skill and ability are empowered and developed and the mathematical concept is grasped with greater understanding and with more meaning.

Leader In Me

Leader in Me is a school wide initiative program that takes extensive training and practice to develop the language and habits to put your school on the path to greatness. There are seven habits that the students learn about that help shape their behavior, attitudes, and overall attentiveness during the school day. Habit 1 is Be Proactive – You are in Charge! Habit 2 is Begin with the End in Mind – Have a plan. Habit 3 is Put First Things First – work first, then play. Habit 4 is Think Win Win - Everyone can win. Habit 5 is Seek First to Understand and then to be Understood – Listen before you talk. Habit 6 is Synergize – Together is better and the last habit is Habit 7 Sharpen the Saw – Balance Feels Best.

Stephen R Covey states, "To put it simply, synergy means "two heads are better than one." Synergize is the habit of creative cooperation. It is teamwork, open-mindedness, and the adventure of finding new solutions to old problems.

But it doesn't just happen on its own. It's a process, and through that process, people bring all their personal experience and expertise to the table. Together, they can produce far better results than they could individually. Synergy lets us discover jointly things we are much less likely to discover by ourselves. It is the idea that the whole is greater than the sum of the parts. One plus one equals three, or six, or sixty--you name it.

When people begin to interact together genuinely, and they're open to each other's influence, they begin to gain new insight. The capability of inventing new approaches is increased exponentially because of differences. Valuing differences is what really drives synergy! Differences should be seen as strengths, not weaknesses. They add zest to life (Lemov, D. 2015).

Convergent vs. Divergent Questions

Students strive to be creative and this is strived to be ever present in the elementary classroom. Although, to understand how creativity works in the brain, we must first understand the difference between convergent and divergent thinking. Ebert, Ebert II, and Bentley (2011) explain that convergent questions are those that typically have one correct answer, while divergent questions, also called open-ended questions, are used to encourage many answers and generate greater participation by students. Besides engaging students' memories through recall, convergent questions can be used to guide students' observations, perhaps

during a demonstration. Divergent questions, on the other hand, stimulate student creative or critical thinking, encouraging students to be better observers. These open-ended questions can guide students as they discover information for themselves, analyze data, make inferences, and identify relationships. As educators, moving towards a student-centered classroom our goal is to incorporate divergent questions and drive our students to think more strategically before answering.

Questioning Techniques

In Teach Like a Champion 2.0 Doug Lemov emphasizes three questioning techniques: call and response, cold call and wait time. When these techniques are used effectively in the classroom; the ratio of class participating is triggered while increasing the level of rigor of student engagement.

Questioning in the classroom has been a critical assessment tool for centuries, and dates back to when Socrates asked questions to his students. Flitz states (2009), “Teaching with questions began with Socrates and has maintained its importance and validity until today. Using this method, Socrates had asked questions to his students, and responded to each question with other questions instead of giving direct information or responses” (as cited in Dos et al., p. 2065). As restated by Sternheimer (2014), the famous Albert Einstein also believed in

the power of questioning when he exclaimed, “ the most important thing is to not stop asking questions” (as cited in Dos et al., 2016, p. 2065).

There is a strong correlation between asking good questions and effective teaching strategies. According to Janet MacDonald (2009), “research indicates that questioning is second only to lecturing in popularity as a teaching method and that classroom teachers spend anywhere from 35% to 50% of their instructional time conducting questioning sessions” (p. 1).

In most educational settings there is a lack of skilled questioning coming from the teacher because we have developed an educational culture which expects students to know the ‘right answer.’ That focus on students getting the one and only right answer to the question refers back to Bloom’s Taxonomy wheel. This is a great resource when writing lesson plans, and now thinking of effective questions to ask, because you want the students to engage in higher level thinking.

MacDonald (2009) emphasizes, “effective use of questioning can enhance learning and create a positive educational climate which will enable the student to explore different elements of a learning situation and engage fully with the learning process. The crucial component is to ensure that questions are selected which provide an opportunity for the learner to carefully consider issues and explore them at a deeper level, to facilitate reflection and aid learning” (p. 2). The greatest task that I have when implementing these questioning techniques, is having my students gain an understanding of being in a student-centered

classroom. I want to allow them to grasp that as learners they are allowed to feel uncomfortable with the feeling that they may not know the correct answer and that they are being challenged to succeed!

MacDonald (2009, p.1) states, “questions should play a central role in the learning process. Because of this, we as teachers need to plan our questions carefully. This doesn’t mean script writing; that would negate creative teaching. However, it does mean we need to carefully plan our questions by thinking through possible questions, which would guide the students toward further investigation and a deeper understanding of the concepts being stressed”

Questioning Technique: Cold Call

The questioning technique Cold Call is a systematic approach. The questions should be everyone, not for signaling out students not paying attention. Random button on Class Dojo is used to call on students. It is 100% valid and reliable because students’ names can be randomly selected again during that same time period. Cold Call is a questioning technique in which you call on students regardless of whether they’ve raise their hands or not. There is ongoing debate within this technique of whether or not this is an effective strategy to use during classroom instruction. Doug Lemov believes that there are four reasons why this simple technique has such a transformative effect on a classroom. These purposes include; checking for understanding, creating a culture of engaged accountability,

pacing, and backstopping your ratio. Lemov (2015) addresses that, “If I was working with a group of teachers and had to help them make the greatest possible improvements in the rigor, ratio, and level of expectations in their classroom with one technique, the technique I would choose might as well be Cold Call” (p. 249).

Classroom Dojo is a great tool to help with Cold Call because it is completely randomized with the press of a button. If students see you frequently and reliably calling on classmates who don’t have their hand raised, they will come to expect it and prepare for it. Cold call allows you to check for understanding effectively and systematically; it increases speed in both the terms of your pacing and the rate at which you can cover material; and allows you to distribute work more broadly around the room and signal to students that you want to know what they have to say. It holds the student accountable. Lemov (2015, p. 170) states, “cold call is the single most powerful technique to improve rigor, ratio, and expectations which instructed and carried out correctly. First, it lets you check for understanding because you choose the student you want to check for master. Second, you don’t waste time waiting and enticing students to answer questions. Third, it allows you to include more students, not just through raising their hands.” Cold Call is predictable, systematic, positive and can be scaffolded. It is a questioning techniques in which you call on students regardless of whether they’ve raise their hands or not. It is predictable because it is an engagement strategy, not a discipline or “caught you” strategy. It is positive

because the purpose of Cold Call is to foster positive engagement in the work of your entire class.

Questioning Technique: Wait Time

Research shows that a typical teacher waits about a second before taking an answer from a student, and the challenges and limitations that are posed by such a habit are significant. Lemov states, (2015, pg. 244) “Wait time can often save you time in the end, as it ensures that you start with higher-quality initial answers. Under ideal circumstances, what happens during Wait Time is thinking. And, of course, affording students significant periods to think after each question you ask increases think ratio.” Some of the benefits of waiting a few seconds between question and answer include: allowing more hands to go up, enabling a wider range of scholars to raise their hands, supporting better and more rigorous answers, prompting more cognitive work during the “wait”, decreasing the number of failures to respond and increasing use of evidence in answers. Crowe and Stanford (2010, pg. 37) exclaimed, “efforts to improve questioning techniques must include an increased emphasis on providing the students with enough time to think about and then formulate adequate responses, and enough time to share these responses with their peers.”

The technique Wait Time is when the educator delays a few strategic seconds after you finish asking a question and before you ask a student to begin

answering it. There are multiple challenges of not giving wait time after a question. These include: answers are unlikely to be the rich, reflective, or developed, encourages students to raise their hand with the first answer rather than the best one. Students are more likely to waste time processing a poor answer before you get to discuss a good one. Waiting and ensuring that you spend your time on higher-quality initial answers may actually save you time. On the other hand the benefits of giving students just 3 to 5 more seconds of wait time include: length and correctness of student responses are likely to increase number of failures to respond (I don't know) is likely to decrease number of students who volunteer to answer is likely to increase use of evidence in answers is likely to increase. The best way to enhance wait time and make sure students are using it effectively is to scaffold and give narrative prompts and reminders. (Lemov, 2015)

In regards to classroom discourse, Cazden (2001, p. 40) exclaims “when teachers ask questions of students, they typically wait one second or less for the students to start a reply; after the student stops speaking, they begin their reaction or proffer the next question in less than one second.” By contrast, she confirmed that when teachers wait for three seconds or more, especially after a student’s response, “there are pronounced changes in student use of language and logic as well as in student and teacher attitudes and expectations.”

Bryan Goodwin (2014), believes that the most important thing teachers can do to rebalance classroom interactions is something we have known for decades. In Rowe (1969), she recorded hours of student-teacher interactions in the classroom and began to observe a peculiar phenomenon. In most classrooms, student-teacher dialogue occurred in rapid fire fashion; teachers peppered students with questions, and students responded quickly with short, clipped answers. She found that in three classrooms she observed though teachers' questions were followed by long pauses before students responded. Rowe (p. 82) exclaims, "the pauses, which I call wait time, extended for three seconds or more, both after teachers' questions and after students' responses, students responses are then more likely to be three to seven times longer, because the students are providing evidence and explaining their reasoning."

Harris (2000, p. 25) portrays the strategy as, "methods to be used using the presentation of a lesson include wait time, listening, responding, and redirection of questions and responses. Wait time is the time a teacher waits after asking a question before talking again. Research into this pause has found that the longer the pause (three to five seconds), the more thoughtful the response. Wait time is especially useful when asking higher-level questions."

Questioning Technique : Call and Response

Call and Response is enhanced when the students are surveyed and a universal sign is then determined. This universal sign would be used by the educator as an indicator to when students could yell and answer in unison. Excitement and lively response is given and this is students' favorite questioning technique that was implemented. Call and response is used when you want to have your class ask questions in unison from time to time and build energetic, positive engagement. Using this technique you can accomplish a lot. When carried out correctly it can be full of high energy fun which immediately drives the levels of student engagement. Hill and Flynn (2008) portrayed that, "using quick answer strategies such as marker boards, post-it notes, and whole class response techniques allows everyone to answer at once and allows the teacher to survey the knowledge level of an entire group and efficiently go on with the lesson" (as cited in Crowe and Stanford, 2010, p. 38).

Lemov portrays that the technique Call and Response is when all students respond. This technique is to build a culture of energetic, positive engagement. There are three primary goals: academic review and reinforcement; high-energy fun; behavioral reinforcement. Along with the goals there are three different ways that call and response can be implemented. First, count-based style is a Ready, set,....; or One, two, ready, you. This method may start with a longer count-based cue and then educators can gradually truncate it as students become

familiar with it to save time. Second, is a Group prompt (Everybody! or Class!) Champion teachers are often strategic about whether they put the prompt before the question or after. The third and final version, is a Nonverbal gesture (a point, a hand dropped from shoulder height, a looping motion with the finger (2015).

Cazden (2001, p.19) states, “teachers know that it’s not always true that all students are eagerly waiting for the chance to speak, and that they have to decide what to do, if anything, about students who choose to be silent. If a silent student is otherwise doing well academically, as shown by written work, should relative silence be ignored? Or is speaking and explaining ideas, and listening and collaborating verbally with peers, a valued outcome of school in its own right—especially now when ‘communicative skills’ appear on lists of abilities needed for high-paying jobs.”

The whole class response is an immediate implementation that drives student engagement because the students can finally call out the answer that they have been wanting to shout out. They synergized to come up with the hand motion that would be used after a question to then respond in this matter, and it allows even the quietest students to get a chance to share their knowledge of the answer!

Questioning Techniques in Mathematical Classroom Discourse

According to Wasserman, (1999, p. 257) “Recent focus on the use of questioning in mathematical discourse supports the advancement of teacher’s questioning strategies as a pivotal instructional process and toll in the student learning process.” The need to develop appropriate questioning techniques is an important part of teaching and assessment for the mathematics student.

The National Council of Teachers of Mathematics states, (NCTM, 1991, pp 35 -36) “The teacher of mathematics should orchestrate discourse by posing questions and tasks that elicit, engage, and challenge each student thinking; listening carefully to students’ ideas; asking students to clarify their ideas orally and in writing. A teacher’s role is to be active in a different way from that in traditional classroom discourse. Instead of doing virtually all the talking, modeling, and explaining alone, teachers must encourage and expect students to do so. Teachers must do more listening and students more reasoning. For discourse to promote students learning, teachers must orchestrate carefully.”

McCarthy (2016), states that teacher questioning in mathematics is an important diagnostic tool for teaching as well as measuring the academic progression and comprehension of the learner. Teacher questioning enhances student learning and self-assessment of the teacher’s lesson delivery effectiveness. If questioning is not presented properly, it can have negative impacts on the student learning process. Identifying “good” and or “effective” questioning strategies is a major challenge to mathematics teachers. To increase teacher

effectiveness and student success in mathematics, a self-assessment of teacher questioning techniques is essential.

According to Mueller, Yankeletwitz and Maher (2014) , research in regards to teachers promoting students' mathematical reasoning has shown that certain conditions promote meaningful, mathematical learning. These include a combination of the following: (a) challenged and active students; (b) observant teachers who attend to the developing ideas of students; (c) appropriate, open-ended tasks that invite students to extend their learning as they build and justify solutions; (d) student collaborations that make possible the exchange of ideas; and (e) a setting that respects and welcome student ideas, conjectures, and alternative ways of working. Under these conditions even young children develop confidence in their ability to solve problems and offer justifications for solutions that take the form of proof.

Skillful questioning of student thinking and monitoring of student problem-solving can provide teachers with a deeper understanding of the development of student's mathematical ideas and help advance student mathematical growth and success. Sahin and Kulm (2008) developed a model for looking at teacher questions and the types of questions being asked. There are three main types of questioning that can be used successfully within the mathematical discourse: probing, guiding and factual.

Probing questions consist of those that ask students to justify and explain their thinking, show proof of how they reached their answer, and use prior knowledge to help aid in the discussion. These questions, help encourage students and build their confidence to engage in mathematical discourse. Secondly, guiding questions help scaffold students by asking for solutions, strategies or procedures, and helping them get to the answer and or understand the taught concept. These types of questions help guide and support students in creating their own steps to problem solving. Finally, factual questions are intended to tell the exact fact or answer to the problem. Sahin and Kulm (2008) found that the majority of teaching questions are factual, even when using reform-based curriculum that including probing and guiding questions in the teaching guide. They suggest that by asking probing and guiding questions, teachers invite students to share their ideas, justifications, and discuss their steps on how they solved the mathematical problem with others. This then creates a classroom community full of collaboration, inquiry, and mathematical discourse.

“Teachers effective use of questions has the potential to generate students’ responses about their mathematical thinking, problem solving, and strategies” (Hufferd-Ackles et. al., 2004, p. 87). Teachers and educators play a crucial role in establishing a successful mathematical community. Communities of mathematical inquiry are classrooms where students learn to talk and work by participating in mathematical discussions, proposing and defending arguments,

asking questions, and responding to the ideas from one another. Mathematical discourse improves in quality when teachers and students share responsibility of communicating about mathematical concepts (McCrone, 2005).

RESEARCH DESIGN AND METHODOLOGY

Research Goals

The goal of my research was to observe how questioning and discussion techniques are effective instructional methods. I wanted to increase student engagement through levels of participation, and exert effort in all my students, so that they will not give up. I used my words and tones to communicate with my students in a positive way. With the future in mind, and not engaging in a once and done practice, I wanted to successfully develop routines with implementing these techniques so they can be carried over to all subjects and lessons throughout the school day.

Setting/Participants

I am a second-grade teacher at Freemansburg Elementary School in the Bethlehem Area School District. We are the sixth largest school district in the state of Pennsylvania, and Freemansburg is one of 16 elementary schools in the district. We have approximately 400 students with over 60% of our population being Hispanic. Over 80% of our students receive free and reduced lunch and come from the borough of Freemansburg and South Side Bethlehem.

In Room 110, I have 17 eager students who enter my classroom ready to learn each and every day. There are 10 boys and 7 girls in my room. Each and every morning we state our pledge, “today I will do my best to be the best. I will

be honest. I will respect myself and the rights of others. I can learn. I will learn. You see I know it's all up to me!" We are Second Grade Superheroes in Room 110!

Rationale

My practice in the classroom was enhanced, as I implemented a total of three techniques to my students to help aim for success. My end goal with these techniques was to drive student engagement, increase participation, exert effort in all my students that they will not give up, and use my words and tone to communicate with my students in a positive way.

This is an experimental research design. My action research is highly fixed as each week a new technique will be introduced and students are aware of the questioning technique that was implemented and focused on. Surveys, checklists, rubric, a field log, and observations will be used as data collection.

Data Collection

One of the most important parts of research is the data collection piece. I took multiple types of data throughout my action research. The most beneficial data piece was my field log and double entry journal. Also, the rest of my data pieces included the pre and post student engagement survey, favorite questioning

technique checklist, colleague observation through a specifically designed rubric, and formative assessments through observations.

From the different surveys and observations through the use of a self-designed rubric I hoped to see a rise in student engagement in my classroom and an overall sense of attentiveness and excitement to answer the questions. I wanted to see which technique the students liked the best and why they responded so well with that particular technique.

Student Engagement Survey

I created a student engagement survey in which I designed myself to help fit the needs of my students the best. (Appendix A). My survey included 21 questions pertaining exactly to our second grade classroom. I also created my own answer key because the students struggled with the number responses. I knew I wasn't going to get a real understanding if I had them answer the question by using a number scale. So I designed the smiley face scale . This scale has five smiley faces, and under each one has a description of what that face means. The beginning survey was given and analyzed at the end of September before any of the three techniques were introduced and implemented. The data collected from this survey provided me with initial feedback about how much the students felt like they are engaged in discussion and how much they enjoy participating in

class on a daily basis. After two months of implementing the techniques, I gave the exact same survey again to see how student engagement has increased.

Rubric

Next, I created a rubric in which I had my colleague positively critique me on. (Appendix D) This rubric allows myself to see how well I am implementing the techniques and how successful the response is from the students. I was observed a total of three times using the rubric. My classroom aide was the one filling out the rubrics. Having her in my classroom from the very beginning has been even more beneficial because she observed our math lessons before there were any questions techniques implemented and then now she was able to observe the math lessons with all the questioning techniques. We met at the end of each week to discuss each formal observation, and the responses she saw from the children.

Formative Assessments through Observations

Student response and levels of participation were all observational for me. I was able to get a grasp on how well students were using their strategies by the level of hands that went up, who yelled out during call and response, and whether students were focused on the task when their name was randomly called on. With

the great benefits of all the observational pieces I did not have any student work to collect on a daily basis.

From the students' feedback and responses to the techniques I found I had an incredible amount of resourceful information. Whether it was that the students don't like a technique, how much they love the call and response, to no way that technique hurts my ears etc. The daily feedback was key to my research because the student response was my most valuable piece of data. Based on their responses I was able to change and implement the techniques differently, so they were the most beneficial for my students.

Open Response Survey : Favorite and Least Favorite Thing

I decided to include an open response survey to allow the students to express themselves a little more. Students had the chance to write how they felt after each week that the new questioning technique was implemented. They were able to write down their favorite thing and their least favorite thing regarding the questioning technique. (Appendix B) This feedback provided the structure for the lessons in which I was going to use this technique again.

Favorite Questioning Technique

At the end of the six week action research the students were given a quarter slip of paper in which they were to check off what their favorite

questioning technique was. (Appendix C). This was an anonymous survey and the students had to do no open response writing. It was a simple check list, which was used as an exit ticket from the math lesson that day.

Field Log

During each math lesson I documented students words and interactions when a questioning technique was used. As quickly as possible, I transferred my notes involving my observations, student statements and notes from each day. During this reflection time I added my thoughts, and reactions to help provide meaningful feedback concerning my research. I was very thorough each and every day because my field log and notes became a valuable way to record my interpretations of how the class perceived the new technique. These entries and the addition of students quotes on a daily basis lead to some powerful messages and statements that I was able to portray in my narrative.

Trustworthiness Statement

In order to ensure that the results of this study were trustworthy and valid, I followed a series of ethical guidelines. First, I obtained written consent and permission from Moravian College's Human Subjects Internal Review Board (HSIRB), which indicated that there were a few modifications that needed to be made to my study proposal. As per the request of the HSIRB board, I made the

necessary modifications and submitted the changes to be filed. I also obtained written permission to conduct the study from the principal of my school, as well as parental consent from the parents/guardians of students who participated in the study. As per my consent letter to parents and students, I only utilized data from those students who had parental permission and agreed to be part of the study, and students were made aware that they could withdraw from the study at any time without penalty. Since my students are so young, I read them their consent form and then asked them to check off the whether they would like to participate or not and then sign their first and last name. Pseudonyms will be used to provide anonymity for all students who are part of the study, and all data will be kept in a secure location and destroyed at the study's conclusion.

Throughout the study, I plan to be careful to remain attentive to the criteria of validity and credibility. The methods that I plan to utilize to establish validity include checking in with students, triangulation of data sources, and ongoing reflective planning. (Hendricks, 2009) I will engage in frequent checks with my students in the form of interviews, pre-and post student engagement survey, checklist of their favorite questioning technique, and validation through observations from my colleagues. Continuous ongoing reflective planning will be a vital part of my study. I am encouraging extensive student input in the form of reflection during the planning processes. In order to maintain validity throughout

the study, I will pay close attention to gathering data through all of these variety of sources.

In order to remain ethical throughout my study, I will be cautious to maintain anonymity. I plan on encouraging my students to participate in the call and response, be active in the cold call approach, and use beneficial techniques during the wait time to help them generate the correct answers.

MY STORY

Student Remarks

School is boring! I hate school! I have so much that I want to say but I am always getting in trouble for calling out and all my friends get mad at me because I shout out the answer when I am not supposed to. I wish I knew how to control myself but I don't. I want to be able to share what I am thinking when I want to. I don't have patience and it makes me sad when I see my teacher and friends upset at me for not following our number one classroom rule of No Calling Out! I know I am smart and I think I am one of the best readers in our room but why can't I just talk when I want? Why can't I call out the answer to show my friends and teacher so they know I know it? I want them to be proud of me and congratulate me that I know the answer and not yell at me and tell me to shhhh and be quiet. It hurts my feelings. Tommy the Turtle our classroom stuffed animal helps me calm myself down when I get so frustrated but I just wish I knew how to control myself more. I like when Miss K challenges me and pushes me to the next level because she knows how smart I am and how capable I am. Although, when she pushes me to succeed I get even more frustrated because I don't want to put in the effort when I know I am going to get in trouble because I can't help control myself. I just wish Miss K would do something about our classroom rules so I can shine in my own way and the way that I know because I want to be that leader and role model student that I am striving to be!

Time to Take Action

Wow! After hearing all of these remarks and comments from students I knew that I needed to take action! I went to my principal and discussed with him that I wanted to implement a strategy in my classroom that is researched based that I could carry out to help drive my instruction.. He immediately handed me the book Teach Like a Champion 2.0 and told me to sit down and read it and come back to him when I had one of these practices zoned in. So I went home did some reading and identified with many of the different practices that Doug Lemov's states are successful in the field of education. This book was greatly relatable to my everyday life as an educator because his initiative is to share what we know about all students, particularly those not born in privilege, to achieve at dramatically higher levels. Doug Lemov documented the concrete actions of effective teachers and his transformative work established a set of techniques for educators around the globe. This is exactly what I was looking for. My goal was to develop new understandings to “teach like a champion” and propel powerful student learning in my classroom!

After reading and strategizing these different concepts Chapter 7 Building Ratio Through Questioning just jumped out at me and I decided to take on this chapter with full force. My new instruction was now going to emphasize using three questioning techniques: Cold Call, Call and Response, and Wait Time.

Planning Time

With the questioning techniques narrowed down to the three that I was going to focus on it was time to develop a plan with my principal and colleagues. I decided to break my action research into weekly chunks so I was able to focus on each task thoroughly (See Figure 4.1).

October/November 2017	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1: Student Engagement Survey	2 1.1	3 1.2	4 1.3	5 1.4	6 1.5
Week 2: Questioning Technique #1 Wait Time	9 2.1	10 2.2	11 2.3	12 2.4	13 2.5 Colleague Observation
Week 3: Questioning Technique #2 Call and Response	16 2.6	17 2.7	18 2.8	19 2.9	20 3.1 Colleague Observation
Week 4: Questioning Technique #3 Cold Call	23 3.2	24 3.3	25 3.4	26 3.5	27 3.6 Colleague Observation
Week 5: All 3 techniques	30 3.7	31 3.8	Nov. 1 4.1	2 4.2	3 4.3
Week 6: Student Engagement Survey/ Favorite Questioning Technique Survey	6 4.4	7 4.5	8 4.6	9 4.7	10 4.8

Figure 4.1: Calendar - Time for a Plan (Unit Outline of Research)

Week 1 – Student Engagement Survey

I developed a student engagement survey (Appendix A) that had a total of 21 questions on the survey. When looking online for pre-made student engagement surveys they seemed to all be on a number scale and I knew that I would not get an accurate consensus with this because the students wouldn't be able to rate themselves efficiently. So I decided to develop my own survey with a key that has a smiley face code and then a description of what each face meant. These relatable codes then really helped my young students grasp the feeling for each of the questions. Along with changing the scale to make it appropriate for my students, I also decided to adapt the questions to my specific classroom for an even greater understanding. Each day I orally read the students four questions and they colored in how they felt with each question that was asked of them.

I explained to my students the key that I developed and what each of the faces stood for. Matt shot up his hand and exclaimed, “Thanks Miss K for the smileys. That really helps me understand all this stuff.” I then exclaimed to the students that it is so important to be honest. This is not a grade, but rather I want to know how you are feeling so I can plan my instruction to help meet your needs in a more successful manner. I stated, “It’s ok to have sad and straight faces and it’s also great to have smiley faces, I just want you telling me the truth, so I have a true understanding of how you feel in second grade.” Scott then exclaimed, “guys

remember, honesty is important. So make sure you aren't lying because I know it will help us if we all tell the truth.”

Week 2 – Questioning Technique #1 Wait Time

The first technique that I introduced to the students was Wait Time. This allows students time to think before answering. As their teacher, I will now wait a few seconds more before calling on students to answer. Usually, I would only wait about a second after I asked the question, which in my learning, of this technique, it is unlikely to lead to the most thoughtful answers from my students. By waiting longer and providing that wait time for students I am more likely to improve the quality of the answers and the number of students who volunteer and become engaged in the discussion.

Calling out was occurring way too much today in class because the students were so excited about the new math lesson. I had to reel the students back in and refer back to the survey that the students took in which they all answered that they did not like when others called out. Calling out made them very frustrated and upset. I did not present the first technique to them orally by specifically saying that I am going to teach you today what wait time is, but rather during the math journal time I asked the students, “What coins do I need to make \$1.19. Remember to use the least amount of coins as possible. Please raise your hand when you know the answer.” I then began to narrate the wait time a little

more and said, “ I love how I see some friends looking at the back bulletin board to see our coins that we used this morning, I like how some friends are counting in their heads which would be the least amount. It’s great to see my friends using their strategies.” I began to then see a lot more hands beginning to be raised and confidence growing because I was using these positive encouraging thoughts and I saw that my students were able to use the time I was giving them to produce a more solid of an answer. Serenity screams out, “Miss K would you just pick on someone already I am tired of waiting.” (I was hoping for this response because I do have some kids that have no patience and they are the ones that are calling out.) Although, with this new method there was a consequence for calling out and it really affected some of my students greatly. I found it very interesting when I didn’t use the positive prompts and narrate during the wait time that the students got antsy and were not using the time wisely. They became easily distracted and began to discuss with their neighbor and not focusing on different ways to solve the problem. I began to tell myself that this is really going to take some time to grasp for the students. As we continued to work on this technique on a daily basis, I hope to see some more engagement, and allow the students to not get impatient and use the wait time quietly and efficiently and began to develop their strategies.

On the third day of implementing wait time I set the timer for students so they had a better idea of how to grasp how long they were going to have so the impatience didn’t set in and the anticipation wasn’t a mystery. This was

productive for some but then others became stressed. Michel called out “would you just turn that timer off and let me think. I feel rushed and don’t like the idea of that because I watch the timer instead of using my strategies.” The first time students raised their hands there was about 6 students that shot their hands up. I chose to state, “students put your hands down and check your answer by using the 100’s chart or number line in the front of your journal. I will tell you when you are allowed to raise your hands.” This time after some narrative prompting and students’ hands not staying raised, 10 seconds later all but three of my students had their hands raised!!

By using small narrative prompts the amount of hands then began to skyrocket because they were gaining other ideas on how to solve the problem, through all my positive cues. It wasn’t a silent wait time but it was a successful and meaningful wait time.

Week 3 – Questioning Technique #2 Call and Response

The first two weeks of school are crucial for implementing routines, practicing them, and instilling the behaviors and language that is expected in my classroom for the year to come. I am very hard and expect a lot out of my students in the beginning of the school year because these two weeks are vital in setting the tone for the rest of the year. The number one class rule that we have in Room 110 is DO NOT CALL OUT! This is very hard for second graders because if they

know the answer, they want to share it right away. When I gave my students the engagement survey in the beginning of week 1 every single one of my 17 students colored in the sad face for how they felt when a friend called out. Even though this rule is distinguished in the beginning of the year it is not always the easiest one for them to follow.

So I had to problem solve and come up with universal language and symbols that can be used to avoid and or alleviate this behavior from occurring. One way to avoid the calling out and or interrupting phase during read a louds, carpet time, and seatwork, is by specific hand signals. This is a form of silent classroom discourse but the other students are aware of what the signals mean, and I can signal right back without having to stop and call on them. This strategy has been incredibly successful and allows the students to meet their needs while the lesson is still flowing. The hand motions are 1 for drink, 2 for sharpen pencil, 3 for bathroom, 4 for tissue and 5 for asking a question or answering. The other way to help alleviate the calling out problem was by introducing my second questioning technique which is call and response. This one is great because the students get to “call out” but it has to be done in unison based on a hand motion that I use to show when this response is appropriate.

I began by having the students collaborate different signals and movements that I could use. Some of the student suggestions were two fists together, eye eye captain and salute, pound a fist in the air, ready to rumble, spirit

fingers, pointer finger wiggle, and an air high five. I decided to really gain the students interest and attention by combining the rumble and the spirit fingers together. The sign that I was going to use from this day going forward when I would allow the kids to call out the answer is a rolling of my arms and then I step out and open up my hands and that's when the kids can scream! My class went wild!!! They were so excited! Michael yells "Yay, that was part of mine! Look Miss K we synergized to come up with our signal. So when can we use it?"

When this hand signal was used they were able to all scream out the answer. One of my students who is always calling out stats, "Miss K please use the fist motion so we can all say the answer...it's exciting!" or he exclaims "when are you going to let us all call out because that is just awesome!" Seeing the excitement of letting them shout the answer has been great! I have put some twists and turns on it and say ok now we're going to whisper the answer, or scream it, or hold our nose and say the answer. This twist adds to the excitement and all the kids want to be involved, so engagement levels are high!

I love building anticipation because I let the roll go on to keep them on their toes and wanting more. They aren't allowed to scream the answer out until I shoot my hands up. So when I have the roll going on for a longer time period, student engagement then rises because all the students are waiting patiently for me to shoot my hands up so they can shout out the answer! The first time I built

this anticipation I had multiple kids that even jumped right out of their seat when they shouted the answer! That's how excited they were!!

On day four, I made the mistake of not using the signs and just saying the students and the answer is? Well they have been anxious and excited using our sign that completely threw them off. Henry slammed his desk and goes “Hey! Miss K your supposed to use the sign so we can all call out. Why didn’t you use the sign that we created?” I loved that the students were able to relate that because when I did not use the technique they were thrown off. They have been doing such an awesome job with it that the amount of calling out occurring completely eliminated during the class time because they look forward to me using the signal.

The call and response technique was so effective for my 17 students that after the fifth day, Kayden came over to me and said, “ You are always so excited Miss K when you use our sign. I love it. Can we please use it other times during the day than just in math class?” Her suggestion allowed me to start thinking how I could transfer my technique to other times during the day and this was one of my goals for the future with the implementation of each of these three techniques.

Week 4 – Questioning Technique #3 Cold Call

Cold call was my last and final questioning technique that I introduced to my students. I decided to incorporate the Class Dojo App that we use on a daily basis to help me with this method. I told the students that I would be using the

random button on Dojo to select a student. If that student is paying attention and answers the question her or she gets a point on Dojo. I stressed to the students that is ok that they make mistakes. I'm not looking for a correct answer every time. I just want you to be trying your hardest and focused on the lesson so when your name is called you can try your best to answer the question.

Every time the students saw me get my phone out to press the Dojo button they fixed themselves on the carpet, their backs got taller, they sat up and they were ready to hear whose name was called. Just that simple task of getting my phone to use the app increased their attention. They wanted to make sure they got those points when their name was called. I stressed to the students that anytime that I was using Dojo to call on friends that they didn't need to raise their hands because this would be determining who was going to get picked. I made sure that students were still problem solving in their heads but waiting patiently and attentively to see or hear their name get picked instead of sitting there waving their hand to get called on.

On day three, of implementing Cold Call we had an activity that required a lot of student participation. I used the random Dojo button for each and every one of the 32 problems. Although, on this day I decided to use Dojo from my computer and have it projected on the screen. This allowed for the students to see the random shuffling of names and the name that was chosen get very large across the entire screen. They would all scream that child's name and it honestly

kept them on their toes because they wanted nothing more than to see their name drawn up on that screen.

My favorite part about the implementation of Cold Call is because of the random selection button. One day when I was using the random button so much to call on my friends, multiple students names were being called on again and again. When I called on Michael for the answer he was so excited but then just three spins later his name was called on again. “Hey! I just got called on that computer messed it up.” This of course made me laugh with his response but this is exactly what I wanted to happen because I proved to the students that the computer didn’t mess anything up. I stated to Michael and the rest of the class, with a huge smile on my face, that “the random button can pick your name at any time because it is random. That means you need to be constantly paying attention and on you’re A game during instruction, so when you are picked you can get your points for participating and trying your best to answer the question! Just because you were called on once doesn’t mean we can now go to La La land for the rest of the lesson.” This made all the students laugh and it was just great to see their levels of anticipation now. One of my little girls who doesn’t say too much raised her hand and said, “ Miss K this gets me a little bit nervous because I never know when I’ll be called, but it also keeps me wondering and hoping my name gets picked from Dojo.”

Even though this technique had a lot of positive effects, excitement and built up anticipation from the class there was one student that took this strategy a very challenging way. One of my little boys has Autism and when I chose to use Dojo again on Day 4 of Cold Call there were only about six friends who I could have answer the questions. I called on all six of those students and there was immediate yelling from the back. “But what about me? I didn’t get picked! That’s not fair! I knew the answer Miss K. My hand was even raised!” I then had to explain to all my friends that we aren’t always going to get picked and that is ok. More importantly you should always be answering the problem in your head.

Week 5 – Wait Time, Call and Response, and Cold Call

This week was my favorite week of research because I was able to incorporate all three of the questioning techniques throughout the math lessons each and every day. The students didn’t know which was coming and loved that even more that I was using all of them during math.

Implementing these techniques one by one over the last three weeks allowed me to practice them, focus on the strengths and weaknesses that each one provided, and helped me establish a concrete foundation in which I can now build my lessons on. I loved how many praises I was able to give out, points on Dojo were rewarded for trying and sitting nicely on the carpet, and the confidence

levels were increased, as I saw so many more hands being raised during the math instruction.

This culmination week gave me such a sense of delight, knowing that my practice of implementing these three techniques provided for stronger lessons and a practice of classroom discourse, engagement, and discussion that produces excellence!

Week 6 – POST Student Engagement Survey and Favorite Technique

On my final week of action research, I gave the students the engagement survey again. This time I did the same format of orally reading four statements to the students a day. We took the survey over the course of the week. The questions were exactly the same as the student engagement survey that was given at the beginning in Week 1 of research. This time though they were allowed to answer how they felt about Call and Response, Wait Time, and Cold Call.

Along with completing the student engagement survey again as a post assessment I handed the students a check list. This was their exit ticket for math that day. They had to check off their favorite questioning technique that I used throughout the last six weeks. They didn't have to explain their reasoning, write any words, or even put their name on it. All that was asked was for them to simply put a check mark in the box next to their favorite questioning technique. I

just wanted to see if there was going to be an overall favorite technique within the class and or which ones the students chose as their favorite.

DATA ANALYSIS

Introduction

Observation is the key in education. As an elementary teacher, I am constantly engaged, observing, reflecting and planning. It is second nature to me because these habits allow me to see which of my students are succeeding and who may be struggling. At such a young age, some of my students don't have that voice yet to truly share their feelings and academic concerns. That is why observation and informal assessment is key to the success of my instruction.

This teacher led action research occurred during my math block on a daily basis during the first semester of the school year. Every questioning technique that was introduced to my students led to my ultimate goal of driving student engagement and have a greater sense of attentiveness and excitement in the classroom.

Throughout my action research, I kept a field log that contained detailed observations, notes about the results of specific questioning techniques, actual statements made by my students and my reflections regarding lessons and behavioral observations. This log helped me identify specific themes in my research. I also had students complete a pre and post student engagement survey (Appendix A) that I designed. I conducted individual informal surveys at the end of each week to establish how the students felt when that questioning technique was implemented in the math lesson. On a daily basis I was constantly assessing

class participation and behaviors and addressing them on my field log. Lastly, I was formally observed and assessed at the end of each week by a colleague to help get a different perspective about my questioning techniques being implemented.

Pre and Post Student Engagement Survey

My most powerful piece of data collection was my pre and post student engagement survey. I gave my students a 15 question survey that enhanced all aspects of the school day and how they felt in school. The initial survey was given my first week of research. We did four questions a day in which I read the students the question so they could make a reliable response. The smiley face scale was also successful because the students were able to relate to the meanings hence portraying their true feelings on that question or statement that was made.

I chose to focus on five of the questions that were the most remarkable to the overall effectiveness of my action research. 17 students were surveyed and data were collected as a result of their answers.

The overall feeling of school has always been an up and down response because of all the factors that are related with school. My students greatly struggle with home lives, battling emotions, their constant needs, and the challenging expectations that is brought onto them on a daily basis. When I gave the survey in the beginning of the year I had at least one student fill out a smiley from each of

the five categories. Representing, that close to half of my class, did not like school at all. They rated it awful, not good, or ok. I knew that I needed to change. So with the implementation of the questioning techniques I was hoping that I would see more of my students fill out that they feel good or awesome about school.

The post survey results showed exactly what I was hoping for! As shown below in Figure 5.1 94% of my students now feel great and awesome about school! They enjoy coming to school and they truly like being there each and every day.

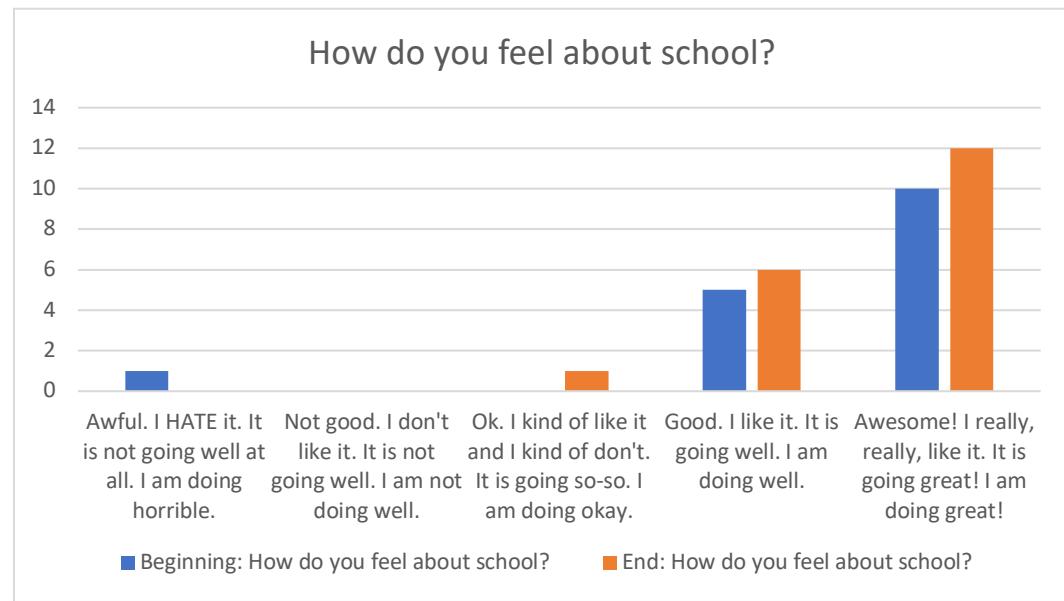


Figure 5.1: Survey – How do you feel about school?

Even though similar, I felt like it would be even more beneficial to specialize more specifically by asking my next question. Not only did I want to find out how students felt about school but in particular, I wanted to find out how

did they feel about being in second grade in Room 110. Since my action research was based primarily in my classroom specifically I felt like it was extremely important to see their level of comfortableness and how they felt about being in our classroom.

I was pleased to see that overall my students enjoyed coming to school. Below in Figure 5.2, portrays the fact that my students do feel comfortable and are excited to be in Room 110 every day. At the end of my six weeks, it was exciting to see that every single one of my 17 students felt that being in second grade was either good or awesome! This positive feedback was so overwhelming because knowing that they love school and are eager to learn every day is so rewarding.

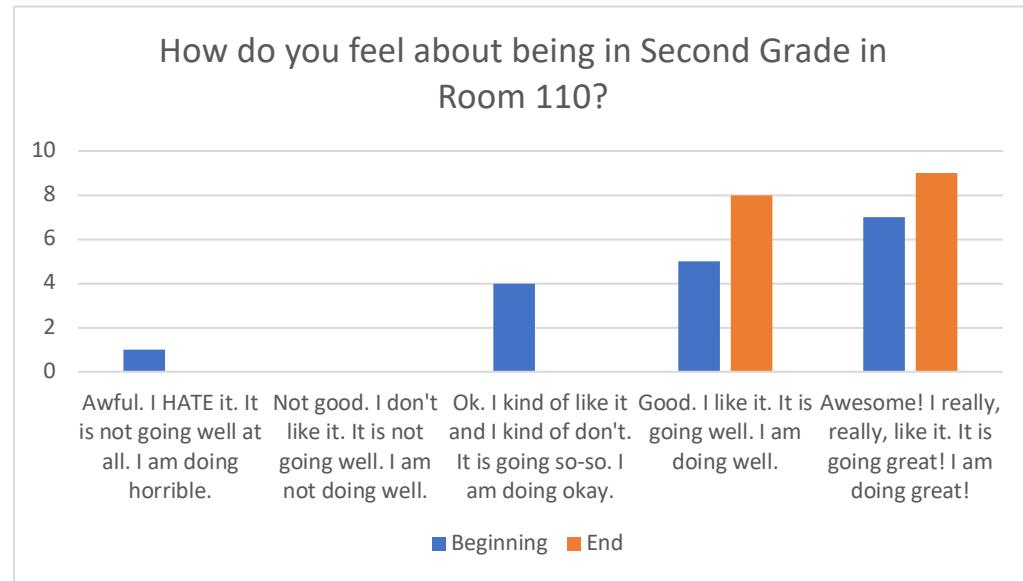


Figure 5.2: Survey – How do you feel about being in Second Grade in Room 110?

Not only did I want to get an overall understanding about the students sense of how they felt in second grade but I was anxious to find out more about their specific behaviors and actions that occur in the classroom. One question on my survey was about being called on. No one likes to be called on when their hand isn't raised especially if they are day dreaming or not quite paying attention at that moment in time.

The student engagement survey that was given before my action research showed exactly what everyone feels when they are called on when their hand isn't raised. In Figure 5.3 below, every one of my 17 students colored in the sad faces that they felt awful and or not good about getting called on. Excitingly enough though, at the end of my action research and with the implementation of Cold Call and the use of Class Dojo I had not one student feel awful about being called on. Since the questioning technique was introduced to the students, and carried out in an effective manner the students hence gained their confidence, wanted to be called out, and levels of engagement were significantly increased because students were now paying even more attention hoping for their name to be randomly drawn!

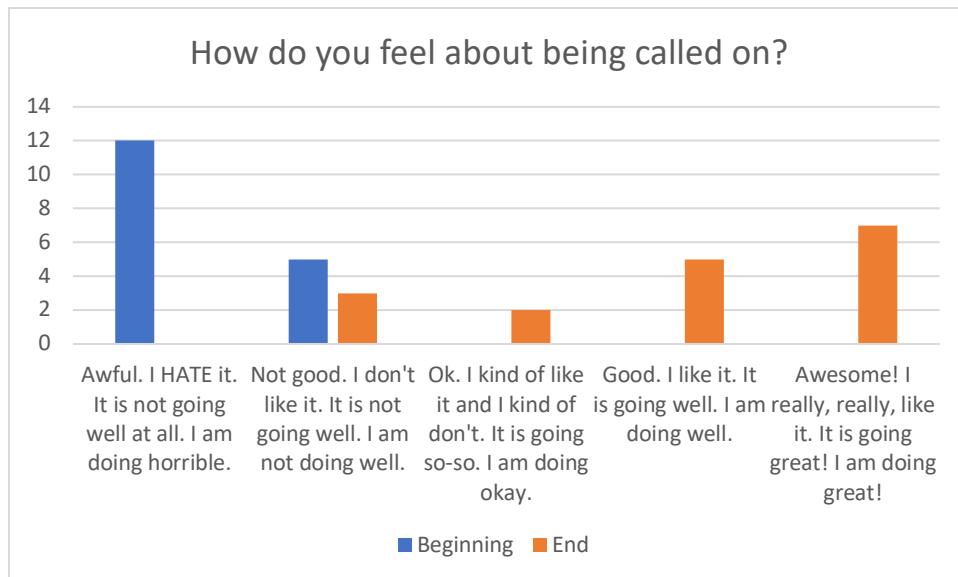


Figure 5.3: Survey – How do you feel about being called on?

Along with being called on, other remarks from students, that I was hearing, was they hated when other students called out. Even though this was one of our classroom rules on the first day of school, “NO CALLING OUT!” It is just out of some of my students control to raise their hand. They call out the answer instead because they are so excited to share that they know it! Not only is this action frustrating to the rest of the students but is frustrating to myself as the teacher because they ruined the opportunity to participate from the rest of the students, they broke one of the classroom rules, and now I had to stop my lesson for them to apologize for calling out.

Knowing that I had to do something I implemented the Call and Response Technique and as a result the feelings of anger towards other students now

become excitement, collaboration, and synergizing among my students and their peers. Figure 5.4 below portrays that in the beginning not one student liked when another student called out. But as a result of the Call and Response technique and when using the universal sign that the students created they could finally scream and call out the answer! Now more students enjoyed the fact that they could call out. Keep in mind though they needed to do it at the correct time and when the signal was used. That is why students were so scattered when filling in their feelings on the survey.

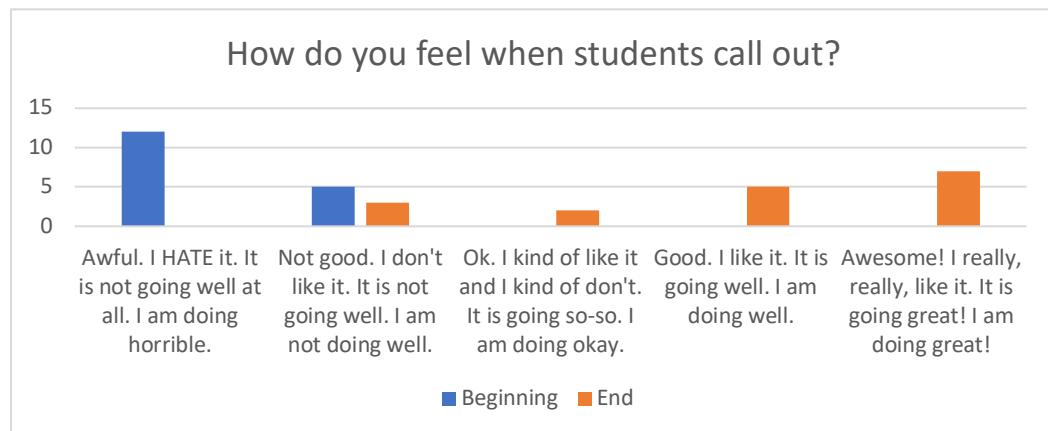


Figure 5.4 Survey – How do you feel when students call out?

The last and final piece of my student engagement survey that I wanted to focus on was how students felt raising their hand to participate and if they were even comfortable doing this. Many students are scared to be wrong hence they won't even bother raising their hand to attempt and answer. Also, you know who

the students are that feel comfortable because they are the ones constantly raising their hand. Yet, you know other students know the answer but you don't want to call them out because that gets them uncomfortable then as well. So by implementing the Wait Time technique I was able to help compensate for the large gap that was present.

Wait Time allowed for all students to have the time and scaffolding measures to feel comfortable raising their hand. This strategy allowed for greater think time and provided the opportunity for more developed answers. As shown below in Figure 5.5, most students hated to raise their hand in the beginning for multiple reasons.



Figure 5.5: Survey – I feel comfortable raising my hand and I enjoy participating

At the end of the study, students now felt like it was Awesome to raise their hand! They now have that sense of ownership. My students are now doing a great job of raising their hand and having an answer to give when they are called on.

Weekly Formal Observations

Three formal observations were completed by my classroom aide to help see how my teaching is incorporating the questioning techniques and how well they are implemented. At the end of each week my aide completed the teacher designed rubric (Appendix D) to help evaluate me. This weekly formal observation allowed me to sit down with her to identify my strengths and weaknesses and it gave me the opportunity to see things from her perspective. This feedback helped drive my instruction for week 5 when I used a combination of all the techniques during each math lesson. Along, with the formal observations, daily observations were ongoing to get an understanding of student responses and levels of engagement.

Wait Time

As a result of implementing this technique I learned that by waiting a few extra seconds and providing meaningful scaffolding suggestions to the students

the amount of participation and hand raising significantly increases. To prove that research is a correct, that wait time is successful, when carried out correctly, I focused in one of my divergent questions each day during the math lesson. First, I asked the question and provided no wait time or scaffolding strategies and the amount of hands that were raised was minimal. I then reasked the same question, a few moments later, but this time I provided wait time and scaffolding strategies to help the students get them towards the answer. The results of students hands that were raised from allotted wait time were significant and are shown below in Figure 5.6. Data shows that by Day 5 there was 100% student participation from each of my 17 students when wait time and scaffolding strategies were implemented!

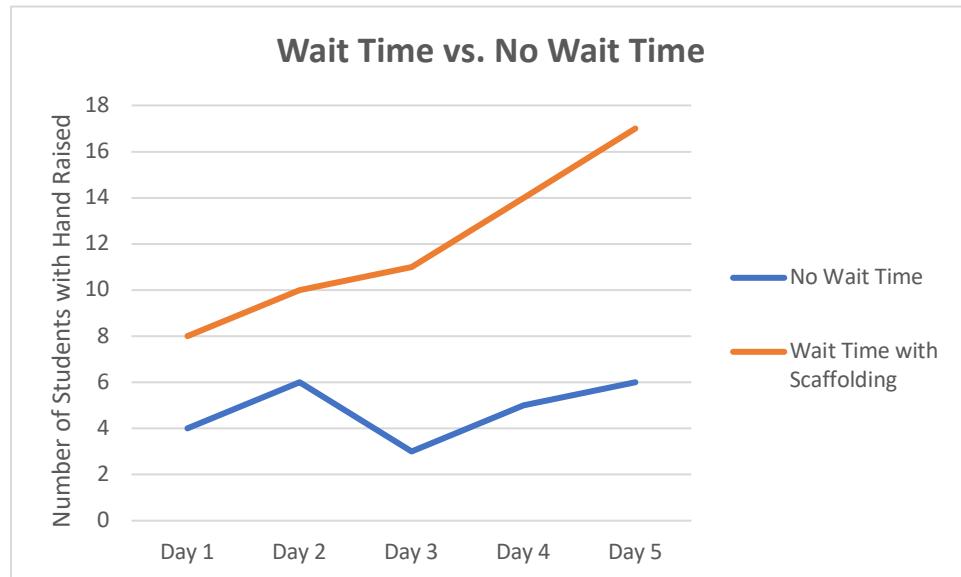


Figure 5.6: Survey – Wait Time vs. No Wait Time

Open Response: Favorite and Least Favorite Surveys

After each week of introducing the questioning technique I gave the students an open response survey. Each week it stated the same question. What is your favorite thing? What is your least favorite thing? These responses helped me to change my instruction by either implementing the techniques more significantly or changing my lessons in ways that would help change the students' opinions on why they didn't like it. Below in Figure 5.7 are some responses from the students about what their favorite things were and their least favorite things were for each of the questioning techniques.

<u>Cold Call Survey</u>	<u>Student Responses</u>
What is your favorite thing about Cold Call? What is your least favorite thing when Miss K uses Cold Call?	<p><u>Favorite:</u></p> <ul style="list-style-type: none">• It's a surprise who is going to get called on.• I earn Dojo points because I am paying attention.• I don't like raising my hand so this allows me to answer the problem and get participation points. I hope I get called on.• Don't have to raise my hand for no reason.• I always have a chance to be called on.• I like it because sometimes I get picked and that makes me happy.• I like it because everyone gets a fair chance to answer the question and it's not always the same person answering. <p><u>Least Favorite Part:</u></p> <ul style="list-style-type: none">• I don't like when I don't get picked and I know the answer.• Sometimes I get nervous to get called on because I may not know the answer.• I may never get called on.• Sometimes I don't get picked when I really want to get picked.• Its random when Miss K uses it so I always have to pay attention.• I don't get a lot of turns to answer.
What is your favorite thing about Wait Time?	<p><u>Favorite:</u></p> <ul style="list-style-type: none">• You don't get rushed• I like having extra time to think• I like to look at stuff in the classroom to help me with answers.• It's quiet when everyone is thinking. I like that.• We get more time to think. I don't feel rushed.• I like that extra time

What is your least favorite thing about Wait Time?	<ul style="list-style-type: none"> Everybody is quiet <p>Least Favorite:</p> <ul style="list-style-type: none"> I don't like waiting for more hands when I am ready to answer the question. I don't want to wait that long to answer Sometimes I know the answer already and I don't want to wait.
<p>Call and Response Survey</p> <p>What is your favorite thing about Call and Response?</p> <p>What is your least favorite thing about Call and Response?</p>	<p>Favorite:</p> <ul style="list-style-type: none"> We get to scream We all get to shout out the same answer I get to talk out loud I like to yell We all get a turn I love the build up. I don't know when Miss K will explode for us to call out. It is exciting. <p>Least Favorite:</p> <ul style="list-style-type: none"> The yelling hurts my ears Sometimes I scream so loud that it hurts my ears when I scream I don't like when friends yell out even when we are allowed To loud

Figure 5.7: Student Responses : Favorite and Least Favorite Things

Favorite Questioning Technique Survey

At the end of my action research and after each questioning technique was implemented, for weeks at a time, I gave my students a final checklist survey (Appendix C). Students had to check off a box to identify what their favorite questioning technique was. I was very surprised with the findings because I was expecting Call and Response to be the favorite questioning technique by a landslide vote.

Based on the data collected and as represented below in Figure 5.8, students' favorite technique was Call and Response, then Cold Call and not far behind was Wait Time. As a result, the implementation showed that each

questioning technique had a higher successful value for every student based on what kind of learner they are.

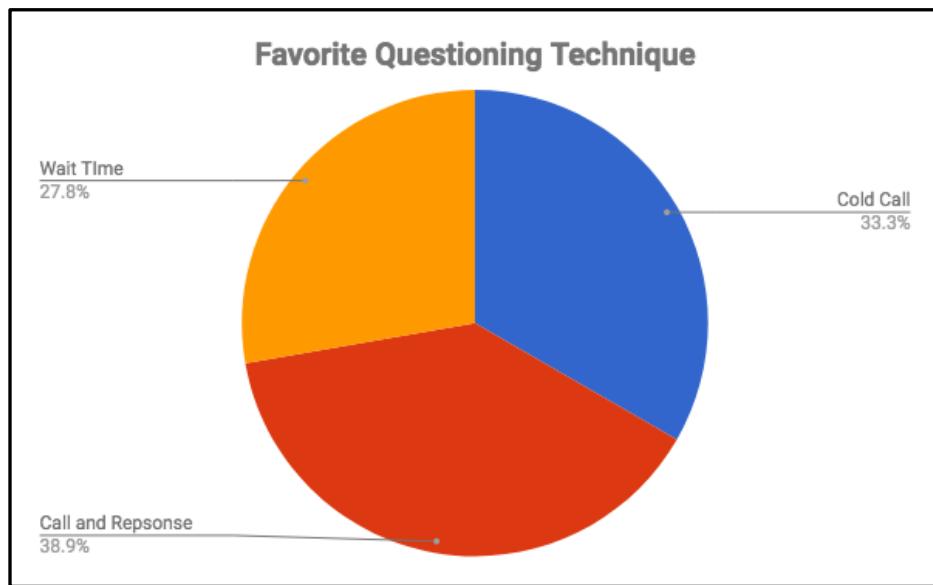


Figure 5.8: Survey – Favorite Questioning Technique

Codes

The qualitative data collected from my field log, surveys, interviews, colleague observation and student feedback were reviewed and analyzed for patterns and ideas. As patterns or ideas became evident, I developed a system of codes to record their occurrence. Below in Figure 5.9 is just one section of my double entry field log. This feedback was my most vital piece of data!

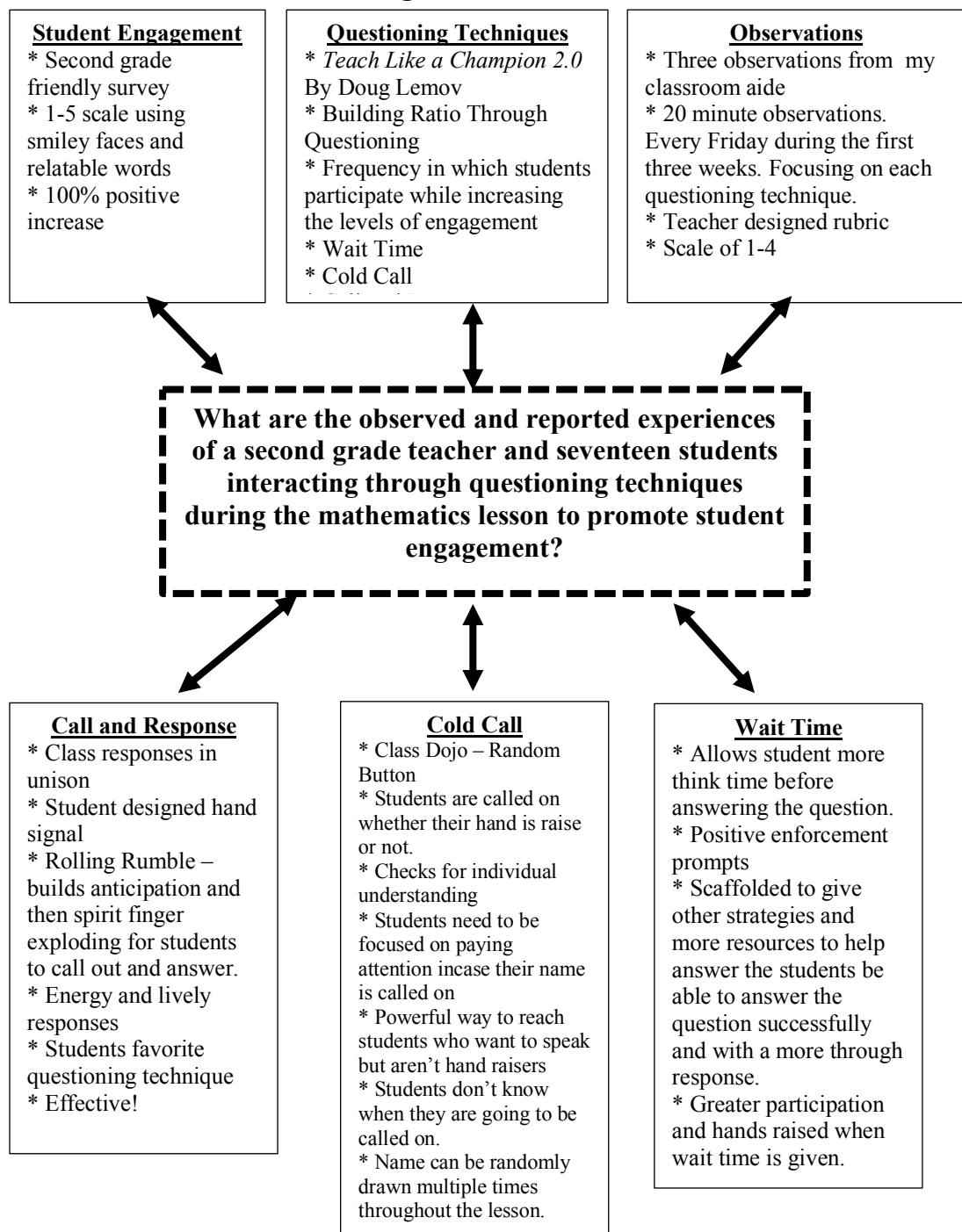
<i>Codes</i>	<i>Observations</i>	<i>Related Codes</i>
Calling Out	Students hated when friends called out. Determined a signal so we could use the call and response technique to scream out our answers so everyone had the chance to shout!	Participating, Call and Response
Call and Response	Student suggestions for our hand signal: * Two fists together * Eye eye captain * Pound in the air * Air high five * Ready to Rumble * Spirit Fingers * Pointer Finger Jiggle	Question, Technique, Engagement
Class Dojo	Random Button Participating Points On Task Points	Engagement, Participate, Cold Call
Cold Call	Introduced my third and final technique: Cold Call Use the Class Dojo App that has a random button so it randomly selects a friend to be called on.	Effective, Class Dojo, Engagement
Confidence	Continued to see hands shoot up as I gave them more time and showed them strategies and resources they could use to answer the question.	Wait Time

Figure 5.9: Codes

Bins

I then took all my codes and organized them into bins. These six bins were the biggest pieces of my research and they all surrounded my action research question. Below in Figure 5:10 is my Bins graphic organizer.

Figure 5.10 Bins



THEME STATEMENTS

Upon completion of the study, when taking the findings into account, first it must be noted that the purpose of this study was to answer the question: What are the observed and reported experiences of a second grade teacher and seventeen students interacting through questioning techniques during the mathematics lesson to promote student engagement? I wanted to discover if the implementation of three questioning techniques would drive student engagement in the classroom. To help organize my findings, I created several theme statements to express the findings of the study.

The Effects of Questioning Techniques on Student Engagement

My drive for this action research was to increase student engagement during the math lesson by incorporating effective questioning techniques. I introduced three different questioning methods: Cold Call, Call and Response and Wait Time to my students. Asking questions is natural and initiative. Questions are asked from the beginning of the lesson all the way to the end. Asking questions forms part of any lessons because it invites the students to think. Questions are used to engage students and sustain an active style to the learning.

By developing these three questioning techniques into the math lesson it has allowed my students to think individually, collaboratively and deeply to enable them to produce stronger answers to be shared out with their peers. Not

only were techniques implemented, but the type of questions that were being asked played a huge impact on my research. By designing open ended questions, students were challenged to think at higher levels. The guidance of scaffolding during these open ended questioning promoted classroom talk, hence increasing immediate engagement because all students were involved! Questioning was no longer used to call students out who weren't paying attention or to identify which students were always raising their hand. Now with these techniques questioning , when used effectively, promote student learning and drive student engagement!

How Surveys Drive Lessons and Instructional Routines

The Pre and Post Student Engagement Survey that I gave to my students at the beginning of my research was the foundation on what drove my instruction and the next steps I took. These survey questions provided me with the feedback that I needed so I could change my instruction, incorporate questioning techniques, and provide opportunities for all of my students to be successful in the classroom. Having this awareness and providing for your students based on their needs is something that John Dewey believed very much in. Dewey exclaims, "It is (the teacher's) business to be on the alert to see what attitudes and habitual tendencies are being created. In this direction he must, if he is an educator, be able to judge what attitudes are actually conducive to continued growth and what are detrimental. He must, in addition, have that sympathetic understanding of

individuals as individuals which gives him an idea of what is actually going on in the minds of those who are learning” (1938, p.71).

The Effects of Inquiry through Exploration and Questioning

Inquiry involves involvement that leads to understanding. Inquiry based learning is the new drive in the educational practice. Inquiry is seeking knowledge, information, and understanding through exploration and questioning. Hands on investigating is key! We need to get away from scripted text, teaching to the test, and constantly testing the child all the time. This practice is not effective and has been turning many children off from school.

“For apart from inquiry, apart from the praxis, individuals cannot be truly human. Knowledge emerges only through invention and re-invention, through the restless, impatient, continuing, hopeful inquiry human beings pursue in the world, with the world, and with each other” (Friere, 1972, p.72).

I have really tried to enhance my math curriculum during my action research to build inquiry into my curriculum. This is when the students’ learning abilities come to life as they can build off each other and gain knowledge from one another. During my research, math was the perfect time for this implementation. Lessons were hands on with the use of manipulatives, and answers were sought out through collaboration. I saw such a difference in learning when my students are engaged through inquiry and not when I am

reading from a scripted textbook. Behavior is also improved because students are constantly moving and involved in each piece of the lesson. Teaching through inquiry with the use of questioning has allowed students to bring out their strengths and provide them with the opportunity to explore new ideas.

The Effects of the Zone of Proximal Development and Wait Time have on Student Achievement

Wait time allows for more in depth answers from students and a greater level of participation and engagement occurs when more time is allowed to process the question. The Zone of Proximal Development is taking your students from what they know as the learner to moving them into the skills that are too difficult for the child to master on his/her own, but that can be done with guidance and encouragement. That is where as the educator, I provided my students with scaffolding strategies to help them develop that solid answer during the math lesson. Whereas before very few hands were raised, but after this enhanced boost and longer wait time there was a significant increase in participation.

L.S. Vygotsky (1978) states “The Zone of Proximal Development can be a powerful concept in developmental research, one that can markedly enhance the effectiveness and utility of the application of diagnostics of mental development to educational problems” (87). After reading and exploring Vygotsky’s work I

have taken a lot of time focusing on the Zone of Proximal development and how this understanding will help me as an educator.

As an educator there are multiple ways that I can scaffold and help my students during this developmental stage. During the math lesson, I now use cooperative learning and partner students that have those higher level skills to work with students who may need an extra boost. This allows the students to work amongst their peers and learn from each other rather than always from me as the teacher. So not only are they being supported during the task at hand, but they are also collaborating and working on their speech and communication skills.

LOOKING INTO THE FUTURE

Now that my research study has ended, I have a list of ideas and ways that I plan on continuing my practice throughout the years to come. My inspiring goal for this study was to find a way to meet the needs of all of my students, on a year to year basis, without having to go back to beginning all the time. I believe that this is just the foundation that I can implement into my classroom to reach that goal. Since these three techniques were so successful during the mathematics lesson, I would like to integrate them throughout the entire school day for an even greater level of success and increase student engagement.

I believe that through proper instruction and support, every child's educational needs can be met, and these steps will then lead to closing that achievement gap that everyone of us educators battles with. Not only will I be just using the three questioning techniques that I focused on in my action research, but I would like to use some of the other tools, techniques, and shared vocabulary from Doug Lemov's Teach Like a Champion 2.0 to achieve these dramatic results in my classroom from the first day of the school year!

I strive for each and every one of my students to be creative, think outside of the box and use their imagination to flourish on a daily basis. By breaking that greatness down into concrete, replicable actions, that the students help design, it will enable all students to achieve at dramatically higher levels. These techniques are practical solutions that work! I'm excited for the future, the implementation of

these highly successful and researched strategies into my entire school day, and knowing that through practice and design, myself and even more importantly my students can be great!

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APPENDICES

A. Pre and Post Student Engagement Survey

Miss Kalamar's Second Grade Class Student Engagement Survey

1. How do you feel about school?

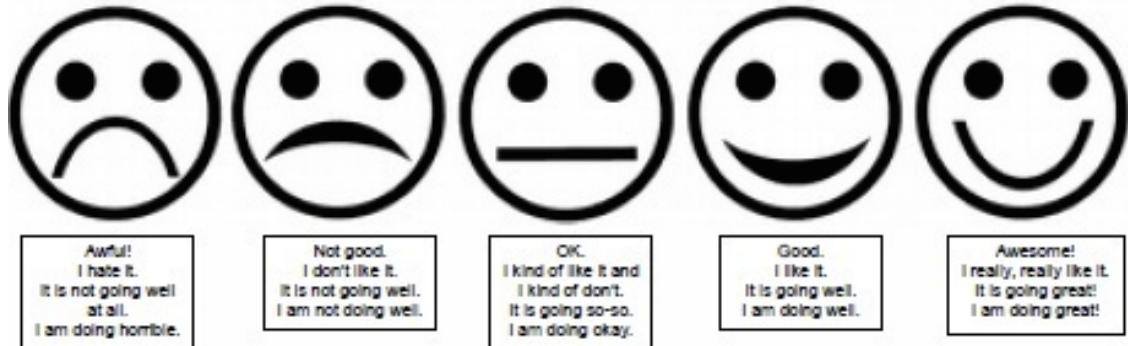


2. How are you doing in second grade?

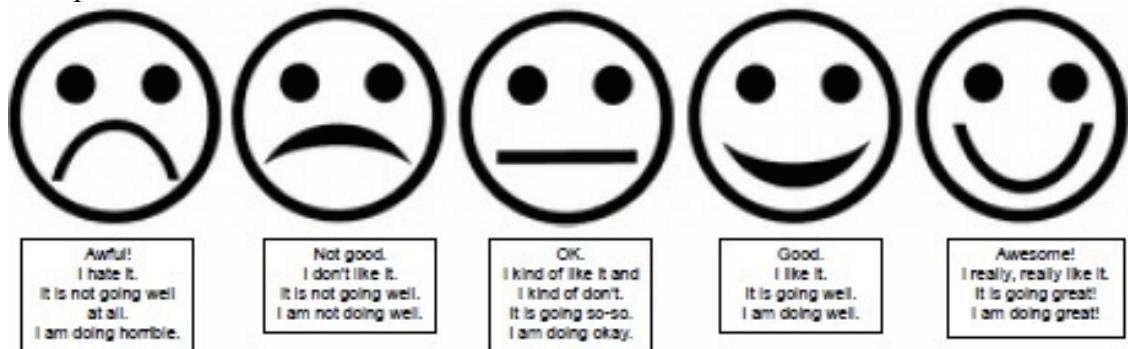


3. How do you feel about:

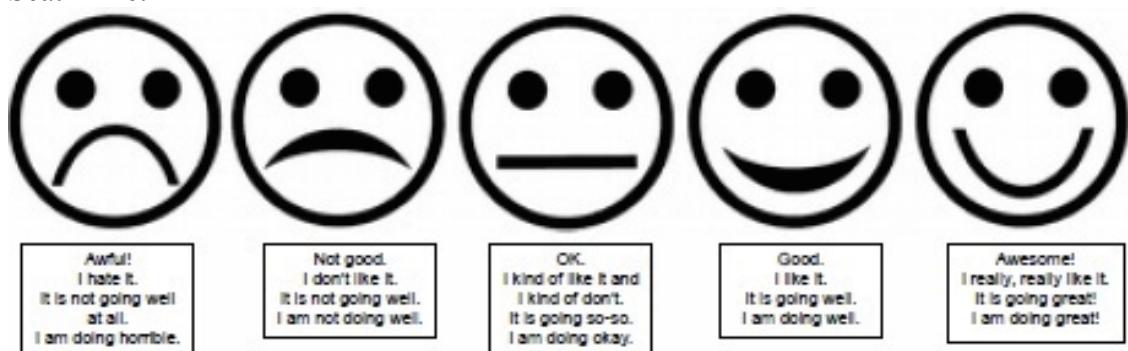
Carpet Time:



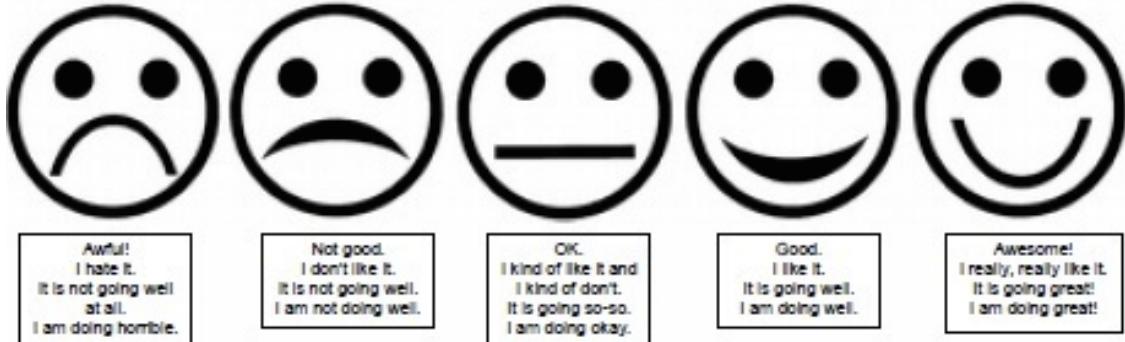
Group Work:



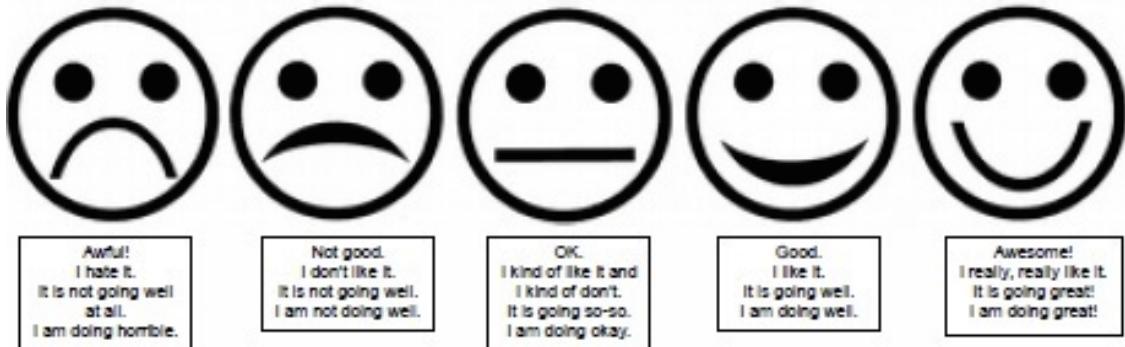
Seat Time:



Class Timer:



Being Called On:



Students Calling Out:



4. I like to work by myself



5. I feel comfortable raising my hand and I enjoy participating

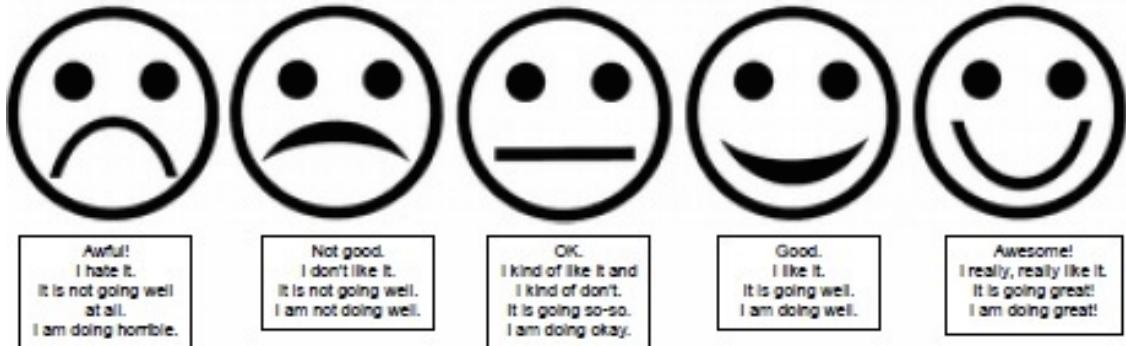


6. Do you work better when the room is

Silent –



Students talking and conversing –



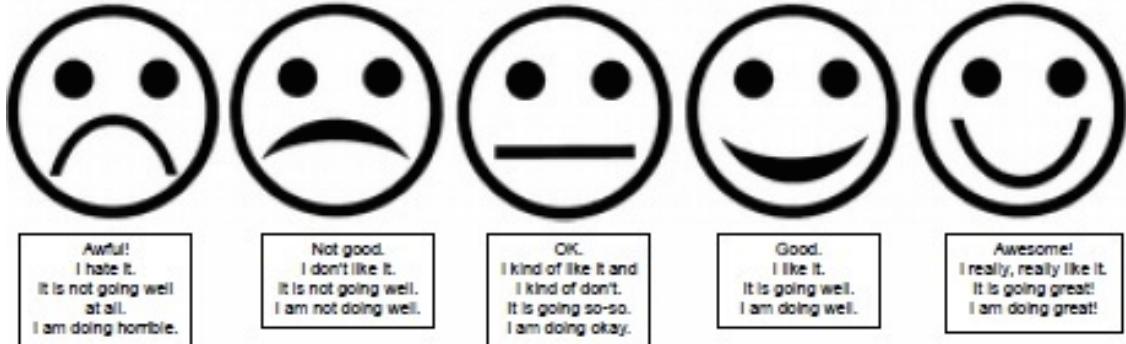
7. I have good friends in school



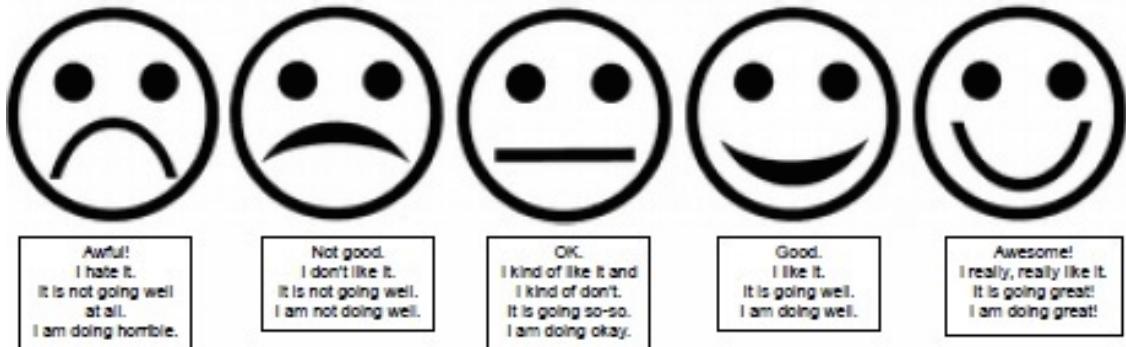
8. I try to do my best in school every day.



9. Miss K believes that I can do well in school.



10. I feel that my schoolwork is important.



11. I am proud and excited to go to Freemansburg.



12. I feel safe at school.



13. I am interested in what I am learning in school



14. I am praised for doing good work at school.



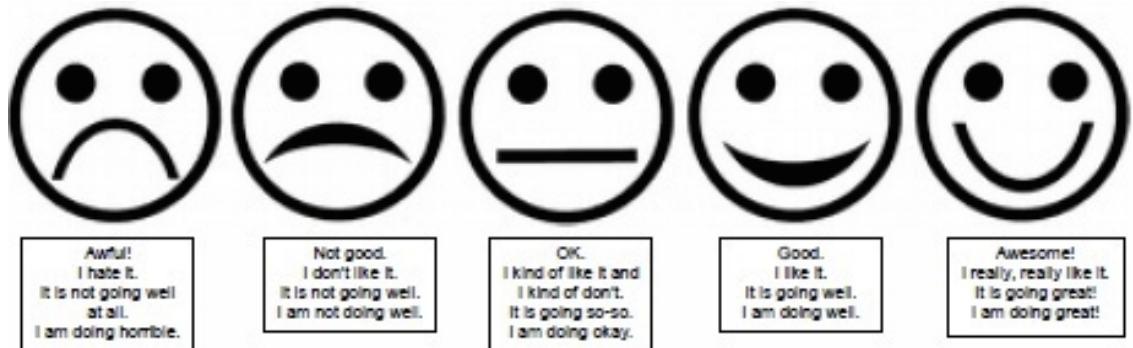
15. I like when Miss K uses:
Cold Call



Call and Response



Wait Time



NAME: _____

DATE: _____

B. Open Response Survey : Favorite and Least Favorite Thing

What is your favorite thing about Cold Call?

What is your least favorite thing about Cold Call?

What is your favorite thing about Wait Time?

What is your least favorite thing about Wait Time?

What is your favorite thing about Call and Response?

What is your least favorite thing about Call and Response?

C. Favorite Questioning Technique – Checklist

What is your favorite questioning technique?

Please check your favorite

Cold Call

Wait Time

Call and Response



D.Teacher Designed Rubric

	Wait Time	Cold Call	Call and Response
4	Teacher uses four prompts to encourage student think time.	Teacher used cold calling and students responded appropriately most of the time.	Teacher asked a question, using hand signal prompt and the class answers in unison to build energetic, positive engagement.
3	Teacher uses three prompts to encourage student think time.	Teacher used cold calling and students responded appropriately some of the time.	Teacher asked a question using hand signal prompt and the class answered in unison.
2	Teacher uses two prompts to encourage student think time.	Teacher used cold calling and students did not appropriately respond.	Teacher asked a question, hand signal was used and the class answered at different times.
1	Teacher uses one prompt to encourage student think time.	Teacher demonstrated limited cold calling.	Teacher asked a question, no hand signal was used and only a handful of students answered.

Wait Time:

1. Narrating how many hands are raised.
2. Encouraging students who are seeking out answers during wait time.
3. Allowing for wait time with silence.
4. Explaining purpose of wait time.

Cold Call:

1. Used in beginning of class.
2. Used multiple times, systemically to ensure 100% probability of any child being called on at any time.
3. No emotion – even tone, calm, positive

Call and Response:

1. Academic review and reinforcement
2. High energy and fun
3. Universal signal for everyone to respond.

E. Consent Forms

a.HSIRB

Account, HSIRB <hsirb@moravian.edu
9/8/17

to me

Dear Kelsey,

Thank you for submitting your revisions. You have addressed all of the concerns listed in your conditional approval. The HSIRB has completed its final review of your proposal and is granting approval of this proposal.

Please note that if you intend on venturing into topics other than the ones indicated in your proposal, you must inform the HSIRB about what those topics will be. Should any other aspect of your research change or extend past one year of the date of this email notification, you will need to file those changes or extensions with the HSIRB and receive approval of the changes before implementation. If you need a hard copy letter indicating your approval status for record keeping purposes, please let me know.

One last step. We need to collect your electronic signature(s). If (each of) you could respond to this email with your own name and the project title in the subject line, that will serve as your electronic signatures. Please do not hesitate to contact me if you have any questions.

Good luck with your research!

Take care,
Dr. DesJardin

Dr. Jean L DesJardin
Chair, Human Subjects Institutional Review Board
Moravian College
hsirb@moravian.edu
desjardinj@moravian.edu
[610-861-1317](tel:610-861-1317)

b. Principal Consent Form

Authorization for a School to Serve in Action -Research Study – Principal Informed Consent

Dear Mr. Alogna,

In addition to being a Second Grade Teacher here at Freemansburg, I am also currently a graduate student working towards my Master's degree in Curriculum and Instruction at Moravian College. A critical component of my coursework this year requires me to study my own teaching practices, and reflect upon how I can better serve my students. In doing so, I will be conducting a systematic research study on what are the observed and reported experiences of a second grade teacher and twenty five students interacting through questioning techniques to promote student engagement and improve academic success. Through this research I hope to observe how questioning and discussion techniques are effective instructional methods that develop critical thinking and problem solving skills in my students daily interactions.

How will this change my classroom instruction? My practice in the classroom will be enhanced, as I will be implementing a total of three questioning techniques from the book Teach Like a Champion 2.0 by Doug Lemov. These techniques will guide my instruction to help my students aim for success. My end goal with these techniques is to drive student engagement, increase participation, exert effort in all my students so that they will not give up, and use my words and tone to communicate with my students in a positive way.

This action-research will begin August 28, 2017 and will end December 4, 2017.

Is this research confidential? The results of my research will be published in my graduate course; however, any and all material that relates to the children's identity will be kept in the strictest confidence. Students will be given a pseudonym, and all paperwork and observations will be kept in a secured file cabinet. I understand that participation in this project is voluntary, and I understand that a parent or guardian may withdraw his/her child from this study at any time by notifying the researcher.

What if a parent doesn't want their child to participate? Please be aware that parents are under no obligation to agree to have their student participate in this research. Furthermore, parents and guardians may choose to withdraw their child from the study at any time with no penalty. However, due to the fact that our classroom discussion and participation is assigned curriculum, all students will complete the same work whether or not they serve as research participants. Only data collected from participants will be included in the research study. If you have any questions or concerns regarding my research study, please feel free to contact me. You may also contact my Moravian College advisor, Dr. Tristin Gleason, at 610-861-1452 or by e-mail at gleasont@moravian.edu.

Consent to Participate in Classroom Research Study Please check the appropriate box below and sign the form:

- I give permission for you to carry out the action-research study. I understand that I will receive a signed copy of this consent form. I have read this form and understand it.
- I DO NOT give permission for you to carry out the action-research study.

Please Sign: _____

Date: _____

I would like to sincerely thank you for your cooperation and efforts in allowing both your students and myself to continue in this journey of learning.

Sincerely,
Miss Kelsey Kalamar

c. Parent Consent Form

Informed consent form Authorization for a Minor to Serve as an Action Research Participant

Dear Parents and Guardians,

In addition to being your child's second grade teacher, I am also currently a graduate student at Moravian College working towards my Master's degree in Curriculum and Instruction. A critical component of my coursework this year requires me to study my own teaching techniques and reflect upon how I can better serve my students. In doing so, I will be conducting a systematic research study on what are the observed and reported experiences of a second grade teacher and eighteen students interacting through questioning techniques to promote student engagement and improve academic success. Through this research I hope to observe how questioning and discussion techniques are effective instructional methods that develop critical thinking and problem solving skills in my students daily interactions.

I am writing to ask permission to use the data I collect from your child during this process. Participation in this study involves only regular classroom activities.

How will this change my classroom instruction? My practice in the classroom will be enhanced, as I will be implementing a total of three techniques from the book Teach Like a Champion 2.0 by Doug Lemov. These techniques will guide my instruction to help my students aim for success. My end goal with these techniques is to drive student engagement, increase participation, exert effort in all my students that they will not give up, and use my words and tone to communicate with my students in a positive way.

This action-research will begin September 11, 2017 and will end December 4, 2017.

Is this research confidential? The results of my research will be published in my graduate course; however, any and all material that relates to the children's identity will be kept in the strictest confidence. Students will be given a pseudonym, and all paperwork and observations will be kept in a secured file cabinet. I understand that participation in this project is voluntary, and I understand that a parent or guardian may withdraw his/her child from this study at any time by notifying the researcher.

What if I don't want my child to participate? Please be aware that you are under no obligation to agree to have your student participate in this research. Furthermore, parents and guardians may choose to withdraw their child from the study at any time with no penalty. However, due to the fact that math is a part of the assigned curriculum, all students will complete the same work whether or not they serve as research participants. Only data collected from participants will be included in the research study. If you have any questions or concerns regarding my research study, please feel free to contact me at 610-866-6681. You may also contact my Moravian College advisor, Dr. Tristin Gleason, at 610-861-1452 or by e-mail at gleasont@moravian.edu. You may also contact the principal, Mr. Mike Alogna at 610-866-6681

Use of data (interviews, checklists, and surveys) from your child is voluntary. You may contact me at anytime if you do not wish to have your child data included in the study. Your child may opt out at any time without penalty. In all consent forms the students can "skip a question that they may not feel comfortable with. Also, parents you can withdraw your child from the study at any point. Please just email me with this request. Thank you for your support in helping me with this study.

Consent to Participate in Classroom Research Study Please check the appropriate box below and sign the form:

- I give permission for my child stated to be used in the study. I understand that I will receive a signed copy of this consent form. I have read this form and understand it.
- I DO NOT give permission for my child's data to be used in this project.

Please sign: _____ Date: _____

Students Name (please print) Signature of Parent/Guardian _____

I would like to sincerely thank you for your cooperation and efforts in allowing both your child and myself to continue myself to continue in this journey of learning.

This is completely voluntary. It will not affect your grade. This will help me become a stronger teacher and educator

d. Student Consent Form

Informed consent form Authorization for a Minor to Serve as an Action Research Participant

Dear Student,

I will be conducting a research study on what are the observed and reported experiences of a second grade teacher and eighteen students interacting through questioning techniques to promote student engagement and improve academic success. Through this research I hope to observe how questioning and discussion techniques are effective instructional methods that develop critical thinking and problem solving skills in my students daily interactions.

I am asking permission to use the data I collect from you during this process. Participation in this study involves only regular classroom activities. You may ask me questions at any time about the study. The principal of the school, Mr. Alogna, has approved this study.

Through this research I hope to observe how questioning and discussion techniques are effective instructional methods that develop critical thinking and problem solving skills in my students daily interactions.

My practice in the classroom will be enhanced, as I will be implementing a total of three techniques to my students to help aim for success. Cold Call, Wait Time, and Call and Response. This study will begin August 28, 2017 and will end October 20, 2017. During this study, I will collect various forms of data. Possible forms of data will include surveys, baseline assessment, and interviews. At the conclusion of the study, all data will be destroyed.

Benefits of participating in this study include increased student achievement and participation. I will not include your name in any report about the study. You have the right to ask me not to include your data in the study or to tell me later if you no longer want your data included.

Thank you for your time,

Miss Kalamar

Please check the appropriate box below and sign the form:

- I give permission for my data to be used in the study. I understand that I will receive a signed copy of this consent form. I have read this form and understand it.
- I do not give permission for my data to be included in this project.

Student Signature _____

This is completely voluntary. It will not affect your grade. This will help me become a stronger teacher and educator.