

Running head: RESPONSE CARDS

Response Cards

By

Heidi L. Hubert

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RESPONSE CARDS

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CERTIFICATION OF PROJECT WORK

We, the undersigned, certify that this project entitled Response Cards by Heidi Hubert, Student, Candidate for the Degree of Master of Science in Education, Curriculum & Instruction, is acceptable in form and content and demonstrates a satisfactory knowledge of the field covered by this project.

[Redacted Signature]

Master's Project Advisor
Dr. Robert Dahlgren Course Instructor
Department of Social Studies Education

May 35, 2014
Date

[Redacted Signature]

Department Chair Mira Berkley
Department of Education

5.16.2014
Date

[Redacted Signature]

Dean Christine Givner
College of Education
At SUNY Fredonia

5-20-14
Date

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Abstract

On task behavior, assessment scores and students participation levels were examined in this project. 20, 2nd grade students, 16 Female, 4 male, 18 of which were Caucasians, and 2 were African Americans students were used for this study. Response cards were used during mathematic lessons on time for 10 days, using an A – B - A – B system. An observation checklist, frequent assessments and a student survey was used to collect data. Overall, the students on task behaviors, assessment scores and students participation levels increased because they enjoyed using response cards and found them helpful.

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Introduction

Off task students taking part in disruptive behaviors and having low assessment scores can be found at any public school, in any grade level, across the country today. Teachers struggle to manage their classrooms while educating their students (Conderman, Bresnahan, & Hedin, 2011). With changes in the state standards students are being assessed quarterly to track their progress throughout the year. Teachers are being ranked based off of how their students perform on these assessments. Teachers and students alike are feeling the pressure. Teachers need to make sure they are using their time more efficiently and effectively. Students need to remain on task to be able to learn the materials needed to do well on these assessments.

There is evidence that shows teachers who use opportunities to respond strategies in their classrooms decrease off task and disruptive behaviors in their classroom. The Opportunities to Respond (OTR) strategies have also shown to increase students' scores (Skibo, Mims & Spooner, 2011). OTR strategies used in many research studies include hand raising, choral responding, and response cards.

Response cards can be used in all subject areas because they can be set up in different formats. The beauty of response cards is that all students have the ability to participate the entire time they are being used, unlike having students raising their hands to answer a question (Armendariz & Umbreit, 1999). With budget cuts and lack of technology at schools, response cards are an inexpensive tool to purchase or create for a classroom (Heward & O, 1996).

In today's society the push for more assessments for students and collecting data on a regular basis seems to be the trend (Smith, Johnson, & Thompson, 2012). With teachers losing valuable teaching time having to prepare students for tests and losing teaching time trying to

manage the classroom, it is important to include strategies in instruction that make the most use of the teaching time available. Using response cards allow for a quick assessment on all students progress thus allowing an easy way to collect data on students. According to Horn (2010), “it is believed that substantial evidence exists to establish response cards as an evidenced-based practice for students who have been identified as having a disability.” Response cards also work well with students from kindergarten to college (Wood, Mabry, Kretlow, Ya-yu, & Galloway, 2009 and Malanga & Sweeney, 2008). They allow all students to respond to all questions posed, actively engaging all students increases their assessment scores and decrease disruptive and off task behaviors (Duchaine, Green, & Jolivette, 2011).

Classrooms are including students that all have different needs and learning styles. Horn, C. (2010) suggests that with:

The recent enactment of No Child Left Behind has inundated general education teacher with students with an array of disabilities. Response cards may be the instructional tool necessary to promote increased rate of academic responding among the diverse populations inhabiting our classrooms. The research provides substantial evidence that response cards are an effective instructional tool that does not require additional planning time or reduce the monetary resource that are currently in short supply. Response cards not only enhance on-task behavior and skill acquisition, but they also provide educators with immediate feedback on their instructional practices, which can be used to guide subsequent lesson formation (p.1).

Response cards are an optimal way for teachers to assess their students' progress. Response cards are a quick assessment. They can be used for a pre-test, during a lesson and/or a post-test. If many students answer questions incorrectly, more instructional time is needed on that topic. In a classroom that uses response cards, there is a non judgmental environment created for the students (Skibo, Mims, & Spooner, 2011). Students no longer have as much anxiety associated with answering a question. They no longer fear giving the incorrect response in front of their classmates. Using response cards encourage all students to participate and answer each question; therefore, it is more likely that more than one student may answer the question incorrectly.

The main purpose of my project is to investigate the effectiveness of using response cards in the classroom. I want to investigate if students using response cards are more likely to participate and stay on task, thus decreasing off task and disruptive behaviors which would allow more time for teaching. I will have the cooperating teacher use a checklist while I am teaching her students for her to track off task behavior. The students will be monitored before I introduce the response cards to them and again while they are using the response cards. I also would like to track students' progress on test scores to see if using response cards increases their score on the test at the end of a unit. I will administer a pre-test to see how students on their math test and before response cards are introduced. I will then administer a post-test after the students have completed the unit and after the response cards have been implemented. Lastly, I would like to survey the students to see if they enjoy using response cards or if they would prefer using a different way to respond to their teacher's questions.

The research questions that drive this project thus are:

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- Do response cards decrease off-task and disruptive behaviors in a 2nd grade mathematics class?
- Do response cards increase students' participation and assessment scores in a 2nd grade mathematics class?
- Are response cards an effective strategy to implement in the classroom?
- Do students enjoy using response cards?

Literature Review

Numerous research has been done investigating the best ways to keep all students engaged during class (Skibo, Mims, & Spooner, 2011, Horn, 2010, Godfrey et al., 2003). Response cards differ from other opportunity to responds strategies, such as hand raising, by allowing all students to participate in the classroom activities (Lambert, Cartledge, Heward, & Lo, 2006). Godfrey et al. stated that “Whole group instruction is a common practice implemented in school settings (Sainato et al., 1987; Vincent et al., 1980; Walter & Vincent, 1983). A functional relationship exists between active responding and the acquisition of academic information. Active responding increases student responding and accuracy. Active involvement increases student learning and on-task behavior in studies with elementary children (McKenzie & Henry, 1979; Miller et al., 1995; Sainato et al., 1987). Active responding involving the use of a response card compared to the responding technique of hand raising, has proven to be efficient in increasing on-task behavior with elementary students (Armendariz & Umbreit, 1999) and students with moderate and severe disabilities (Ketterer et al., 2000) and the acquisition of discrete academic skills with elementary students (Narayan et al., 1990).” (2003) Lambert et al. also noted an increase in correct responses and an increase in quiz scores.

Response cards are substitutes for hand-raising for students (Lambert et al., 2006). They encourage all students to be active and involved during class (Lambert et al.). In a classroom that uses this strategy, all students use their own response cards. According to Duchaine et al., “When all students respond during a lesson it provides a means of formative assessment. By seeing student responses during instruction, the teacher has the opportunity for immediate corrective feedback as errors occur (Cavanaugh et al., 1996; Lambert et al., 2006), clarifying confusion

before moving on to the next step (Christle & Schuster, 2003). For example, when using response cards to teach how to multiply a three-digit number by a two-digit number, a teacher notices several students misaligning numbers by placing digits in the ones and tens columns rather than in the tens and hundreds columns. She stops and corrects this step before the students are expected to complete an independent assignment. This early correction prevents students from practicing errors, possibly preventing errors in future independent work (Conroy et al., 2008).” (2011). The student may each have a card or a set of cards. Either way, the response cards, are giving everyone an opportunity to respond to questions asked (Lambert et al.). For example, Lambert et al. reported using response cards in a 4th grade mathematics class, students responded to questions on solving mathematical problems. Instead of asking students, to be recognized by raising their hand or calling out responses, they wrote their answer on a white board. When the teacher gave the prompt, students held up their response board with their answer on it. According to Lambert et al. “At this point, the teacher would scan through the students' answers. If all of the students provided the correct answer, the teacher would praise the class, instruct the students to wipe off their response card with the tissue, and move onto the next question. When more than one fourth of the class failed to provide the correct answer, the teacher explained the steps involved to solve the problems and then directed the students to correct their answer. After the correction, the teacher presented the same question again for the students to practice the question correctly. If only two or three of the students responded incorrectly, the teacher gave the students the correct response, instructed the students to check their answers, and then moved onto the next question without having the students present their response cards again for the same question.” (2006). The teacher used a student roster sheet and placed a check mark

by the student's name that got it correct. She placed a minus sign by the student's name that did not get it correct. Then she had all students erase their boards, and she discussed the correct solution. The teacher then proceeded with this technique for another 10 to 20 minutes per class.

Response cards are an optimal way for teachers to assess their students' progress (Duchaine et al., (2011). Response cards are a quick assessment. They can be used for a pre-test, during a lesson and/or a post-test. If many students answer questions incorrectly, more instructional time is needed on that topic. In a classroom that uses response cards, there is a non-judgmental environment created for the students (Skibo, Mims, & Spooner, 2011). Students no longer have as much anxiety associated with answering a question. They no longer fear giving the incorrect response in front of their classmates. According to Randolph, "Response cards increased scores. Test scores had an effect size (Cohen's d) of 0.26 in the response card direction. The proportion of students receiving 80% or better on tests rose from 41.8% to 52.1% in the response card condition. Quiz scores were 0.80 standard deviations higher in the response card condition than in the hand-raising condition. The proportion of students receiving 80% or better rose from 29.7% in the hand-raising condition to 62.2% in the response card condition." (2007). "An especially powerful benefit of using response cards is the anonymity of the responses. Challenging behaviors often occur when a struggling student, uncertain of academic ability or with a history of academic failure, is expected to perform in front of peers (Miles & Stipek, 2006; Scott et al., 2001). Although classmates may look around and view their peers' answers, there may be less pressure using a response card than providing a verbal answer that everyone in the class will hear or going to the board to solve a problem in front of the whole class (Lambert et al., 2006). Overall, response cards provide a safer environment for engaging all students." (

Duchaine, E. L., Green, K. B. & Jolivette, K. (2011). Using response cards encourage all students to participate and answer each question; therefore, it is more likely that more than one student may answer the question incorrectly.

Increased Student Engagement and Decreased Disruptive Behavior

Response cards have benefited students in preschool (Godfrey, Grisham-Brown, Schuster, & Hemmeter, 2003), to students in colleges and universities (Malanga, P. R., & Sweeney, W. J., 2008). For example, Godfrey et al. reported the use of response cards during a whole group preschool calendar time. During this time, there was an increase of on-task behavior. On-task behavior was defined as looking at the instructor, selecting a response card at the appropriate time, and holding it up. Also during this time, there was a decrease in disruptive behavior. “Disruptive behavior was defined as one or more of the following: engaging in a conversation with others during teacher-directed instruction, provoking others (i.e., making faces at others, laughing at or touching others, making noises or sounds with voice, tapping objects, pounding on desk, voicing disapproval with instruction, throwing or twirling objects), attending to other stimuli (e.g., looking at or playing with other objects in desk or misusing response cards or other instructional tools), writing notes to friends or drawing pictures, spitting, sucking on fingers, or leaving assigned seat without permission (including tipping back in chair on two legs).” (Lambert et al., 2006). Disruptive behavior included not paying attention to the teacher, mishandling the response cards, raising them at an inappropriate time, and not participating in the activity. There was also an increase in the number of students responding to each question.

Students preferred using response cards to hand raising and choral responding (Godfrey et al., 2003).

Lambert et al. (2006) reported that students who are engaged and active in class are not disruptive, which increases the amount of time spent learning. Lambert et. al (2006) noted that response cards decreased disruptive behavior in a fourth grade urban mathematics class. More time was spent on classroom management, and less time was spent on academic instruction. Using response cards, the whole class stayed involved. The students in this study responded enthusiastically, energetically and quickly. The disruptive behavior that decreased included talking to others while the teacher was giving instruction, making faces at others, laughing at classmates, touching others, making noises or sounds, tapping objects, pounding on desks, and throwing objects (Lambert et al., 2006).

Response cards have worked to keep all students engaged and on-task, including students with special needs (Skibo, Mims, & Spooner, 2011). Students in a 4th grade self-contained classroom were able to use response cards. The students used response cards to learn number identification. According to Skibo et al. the students who were unable to hold up their response cards tapped on the table to signal their response. During the study, the teacher prompted the students by saying show me the number 4, for example, the students would then hold up their response card with the number they thought was correct.” As in this study, students were given the opportunity to answer with prompting when needed until the student could independently answer the task direction (i.e., presentation of the numeral and command to “find the one that looks like mine”) and the prompts were systematically faded over teaching trials resulting in skill acquisition. Students also demonstrated improvement in answering with the response cards,

which is consistent with Berrong et al. (2007) when the authors suggest “response cards have positive effects not only in terms of increased students’ responding and accuracy of student’s responding, but also in an increased student academic learning” (p. 189).” (Skibo, Mims, & Spooner, 2011). After all students selected their number, she showed them the correct number. According to Skibo et al. students in this classroom also had a decrease in off-task/ disruptive behavior and an increase in participation.

Increased Academic Performance on Responses and Quiz Scores

Lambert et al. (2006) reported that response cards had increased not only appropriate behavior and student engagement, but also student’s academic performance. When response cards were used in a fourth grade mathematics classroom, the students had an increase in the accuracy of their responses (Lambert et al., 2006). Horn (2011) also reported on another fourth grade class that had success using response cards. According to Hunter & Haydon, “the data indicate that there was improvement in scores for both students during both intervention phases.” (2011). In this social studies class, there was an increase response rate for each student. When they did respond, there was a higher rate of accuracy in their responses. Also, daily quiz score grades increased. (Horn, 2010) With students with disabilities, the use of response cards, students were able to correctly identify numbers (Skibo, Mims, & Spooner, 2011).

The purpose of the present study, therefore, was to examine the effects both academically and behaviorally of response cards on students during math class. The primary research questions are: (a) what effects will the response cards have on the student’s ability to stay on-task

and not exhibit disruptive behaviors, (b) what effects will the response cards have on each student's academic performance, and (c) will the students enjoy using the response cards?

In the following section, I will detail the methods for my project. It will describe the subjects and setting. It will also include both quantitative and qualitative measurement tools.

Methods

Rationale

The government is keeping a close eye on education lately. They are trying to get the United States to be able to compete academically with other countries, like Japan. They are focusing on mathematics and science in the Race to the Top legislation. They are focusing on mathematics and language arts with the Common Core. The government has also introduced Annual Professional Performance Reviews (APPR). For APPR all teachers are rated, everyone strives to be highly effective. In order to be ranked highly effective one thing teachers need to do is to collect data, and lots of it. My research project investigates students' participation in math class and assessment scores. Using a mixed methods approach, I will be able to get both sides of the research spectrum. I will be investigating the issue of whether using response cards during math class, increases student participation and thus decreasing off task behaviors that can be disruptive to others and also if using response cards increase students assessment scores. The research will be collected using data collection tools such as surveys, assessment scores, and observations.

Subjects and Settings

The study was conducted in a small-sized (i.e., 300 students), rural elementary school in Western New York. It took place in a 2nd grade, general education classroom comprised of 20 students (16F, 4M). Nineteen students were Caucasian and one was African American. Students ranged in age from 7 to 8 years old. One had a 504 plan for additional help with mathematics and reading, she was not in the classroom during this study. Five students are pulled for additional help with mathematics as part of Response to Intervention; they are pulled after the classroom

has finished their mathematics lesson. The teacher, a Caucasian female with approximately 24 years of teaching experience, noted that a substantial proportion of students in her class failed to stay on task and their overall grades on assessments were below grade expectations. The use of Response Cards was explained to the teacher and she expressed her interest in participating in the project. Response cards can be made out of different materials and formatted differently, in the case the students used a laminated clock and dry erase marker. When response cards are used in a classroom, all students can answer the question/s. The teacher in this classroom used hand raising for students to respond to her questions. The questions that she asked had only one correct answer so the first student called on if they answered it correctly; no other students got a chance to answer it. Thus, one student participated for each question, assuming they answered it correctly, this left time for other students to get off-task. The students may have been introduced to response cards in previous grades but they have not used them on a regular basis which is why I selected this class. I felt it was important to track how students do behaviorally and grade wise when they started using response cards on a daily basis. Selecting a class that has not implemented response cards before allowed me to show if they were effective or not. Using this class also showed teachers what they may see in their own classrooms if they chose to implement response cards. Teacher, pupil, and parent consent was obtained according to the University Institutional Review Board policies and procedures. The project was conducted during regularly-scheduled math classes and all assessments were standardized for length, difficulty, and format.

Dependent Variables

The primary dependent variables in the study were (a) amount of off task behavior (b) assessment scores. I observed the students during mathematics time before implementing

response cards. I kept a tally of how many times a student was off task. Off task behaviors I was looking for included looking out the windows, talking to a neighbor, doing something else while the teacher was giving instruction, etc. I again tallied off task behaviors when the response cards were implemented. I graphed the results of the off task behavior using a simple line graph. The data was analyzed to see if response cards decreased the amount of off task behaviors during math class. I used the first observation to compare to the second observation to see if implementing the response cards decreased off task behavior and increased participation.

The assessment was given twice, once using hand raising and once using response cards. The assessment score was calculated by taking the individual's score and dividing it by the total number of possible points on the assessment. If a student was not present for the assessment their scores were left as a 0. The scores were graphed using a simple line graph to show the relationship between response cards and scores. The students' assessment scores were looked at to see if students' grades increased after response cards were implemented.

To ensure that data were being collected accurately and consistently, the investigator and classroom teacher *independently* scored pupils' math assessments during 25% of randomly selected days across all experimental phases. Inter-scorer agreement was calculated on an *item-by-item* basis. If both scorers marked an item in the same way (i.e., both correct) then that item was marked as an agreement (A). If independent scorers marked items differently (i.e., one correct and one incorrect) then that item was scored as a disagreement (D). Inter-scorer agreement was then calculated as the number of agreements divided by the number of agreements and disagreements times 100%.

Independent Variable

The independent variable was the use of response cards. All students were introduced to the response cards and their purpose before they were used. The students learned how they would be implemented in the classroom and what would be expected from them during this time.

The students were also asked to complete a survey at the end of the study. The students used a likert scale to rank if they liked using response cards. They also ranked if response cards were something they would like to continue using in class and if they found them helpful. The results from the survey will be discussed in the results of my thesis paper.

Experimental Design and Procedures

An A-B-A-B withdrawal of treatment design was used to assess the effects of the response cards on students' behavior and their assessment scores. This particular design is capable of establishing a functional relationship between the intervention and its outcomes by showing that student performances change, *when and only when*, the intervention is presented and/or withdrawn (Kennedy, 2005).

In order to complete my research, I spent 10 math classes in a 2nd grade classroom. The general education teacher taught her students about time during these sessions for 50 minute increments. The general education teacher also observed the class each day to track her students off task behavior during the lessons. She used a checklist to tally students off task behavior. The results will be discussed in my thesis, I will also construct a chart to show the off task behaviors observed before response cards were implemented and then after the response cards are implemented to see if there is a relationship. I also gave four assessments that included two matching, 6 multiple choice and two word problems. The assessments included questions on telling time and clock formats. Two of the assessments were given during the first week, when

only hand raising was used. The other two assessments were given during the second week, when response cards were used. Again, the results were graphed to determine if there was a relationship between response cards and assessment scores.

Baseline. In the present study, students' on-task behavior was first examined under typical or normal teaching conditions. Also the students were given an assessment to compile an assessment score before the response cards were introduced. During these initial baseline sessions, the general education teacher kept track of off-task behavior while she was teaching. Percentage scores from the assessments were recorded for all students and later forwarded to the investigator. During the baseline, there were no explicit consequences (neither positive nor negative) for assessment performance (good or bad). Scores were typically entered into the teacher's grade-book and pupils were given general feedback on their assessments.

Intervention. Prior to the intervention phase, the investigator instructed the general education teacher how to implement the intervention. After initial baseline sessions were completed, students participated in a brief (i.e. 20 minute) training session led by the general education teacher. The teacher announced that the class would be using response cards for the next few weeks. She described how the response cards would be used.

A typical intervention session worked as follows: First, the general education teacher reviewed what the students had learned yesterday. She would ask the students' questions and they all were expected to respond to each question using their response card. Next, she would introduce today's lesson and teach the lesson. She would walk the students through a few examples before asking the students to apply the knowledge they just learned to the problems. Lastly, she would ask the whole class time problems. All students were expected to participate

and respond. At the end of the session she would give the students an assessment to check their scores while using response cards. The teacher also tracked students off task behaviors during this time.

Withdrawal. After the intervention data stabilized, the intervention was removed for two days (return to baseline conditions). Students were informed that they would not be using response cards during that time. All response card materials were removed.

Intervention II (Reimplementation). Following the second baseline period, the intervention was reintroduced. For this phase, the students were informed that they would again be using response cards during their math lesson. All response cards related materials were displayed again and response card rules were reviewed regularly.

In the next section of my thesis, I will discuss the results from my project. Each student's data will be graphed and explained. You'll be able to see if I obtain the same results that response cards are beneficial to students to stay on task, students will receive higher grades on assessments and that students enjoy using them as the previous research has shown.

Results

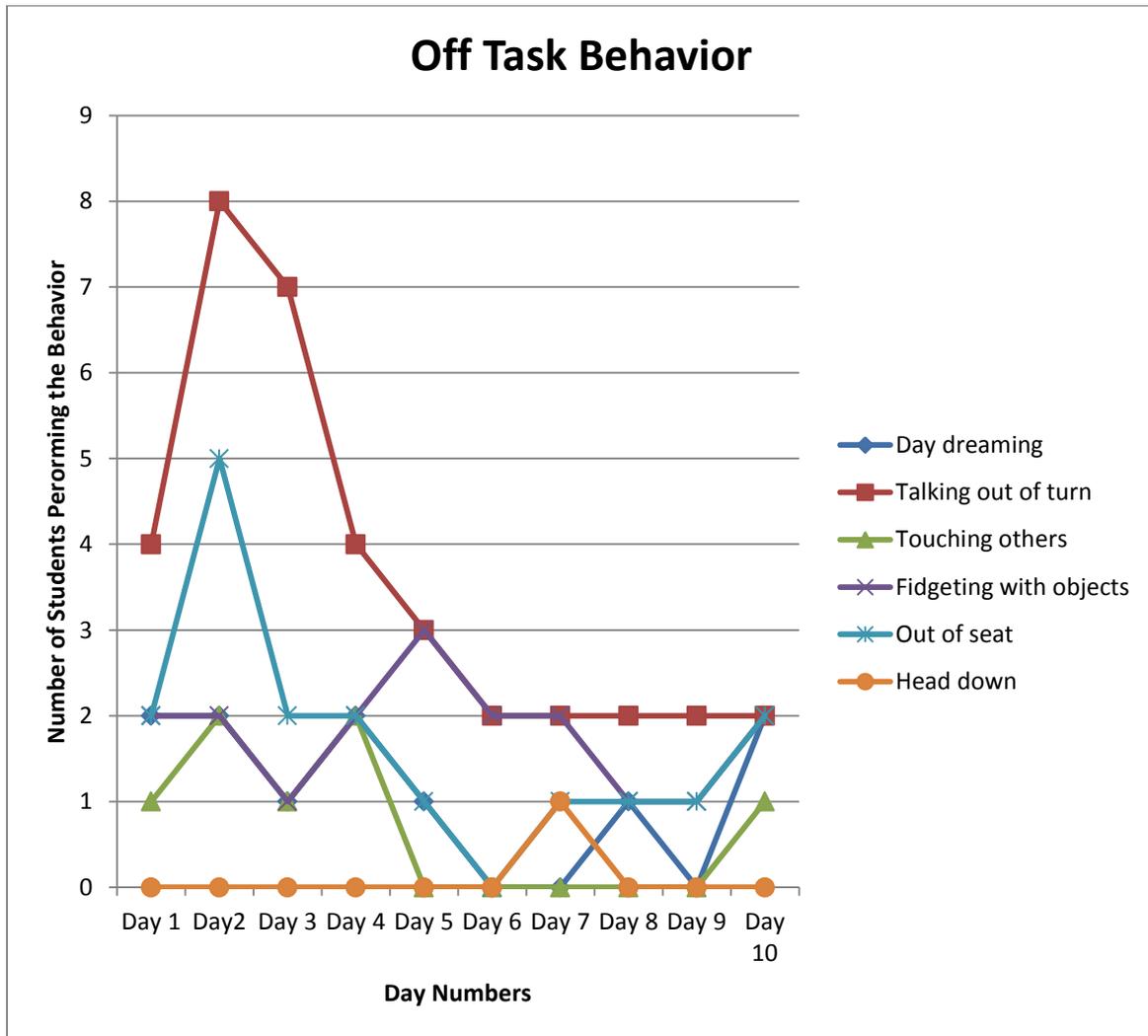
For my research, I spent 10 math classes in a 2nd grade classroom. The general education teacher taught her students about time during these sessions for 50 minute increments. The general education teacher also observed the class each day to track her students off task behavior during the lessons. She used a checklist to tally students off task behavior. The results will be discussed in this part of my thesis, I have constructed a chart to show the off task behaviors observed before response cards were implemented and then after the response cards are implemented to see if there is a relationship. I also gave four assessments that included two matching, 6 multiple choice and two word problems. The assessments included questions on telling time and clock formats. Two of the assessments were given during the first week, when only hand raising was used. The other two assessments were given during the second week, when response cards were used. Again, the results were graphed to determine if there was a relationship between response cards and assessment scores.

The effects of using response cards on the class's off-task behaviors during math lessons on time can be seen in Figure 1. During initial baseline observations, only about 1 student (5%) of the class was off task daydreaming during math lessons per day. About 8 students (40%) of the class were talking out of turn. About 2 students (10%) of the class were touching others. About 2 students (10%) of the class had busy hands and were fidgeting with objects. About 3 students (15%) were out of their seat. And no students (0%) had their head down. When response cards were implemented on days 5-9 students only 1 student (5%) were daydreaming. About 2 students (10%) of the students talked out of turn. About 0 students (0%) of students were

touching others. About 2 students (10%) were fidgeting with objects. About 1 student (5%) was out of their seat. And only about 1 student (5%) of students had their head down. On the last day the response cards were removed and the results are as follows. About 2 students (10%) were daydreaming. About 2 students (10%) of the class were talking out of turn. About 1 student (5%) of the class was touching others. About 2 students (10%) of the class had busy hands and were fidgeting with objects. About 2 students (10%) were out of their seat. And no students (0%) had their head down. The results from the off task behavior checklist show that students were more less likely to daydream, talk out of turn, touch others, and be out of their seats when response cards were implemented. Students were more likely to have busy hands/ fidget with objects and have their head down while using response cards.

Figure 1 shows the effect of response cards on the number of off task behaviors performed during math lessons on telling time. The off task behaviors include daydreaming, talking out of turn, touching others, busy hands/fidgeting with objects, out of seat and head down.

Figure 1



Note- Day 1-4 and Day 10 the students were not using response cards. Day 5-9 the students were using response cards.

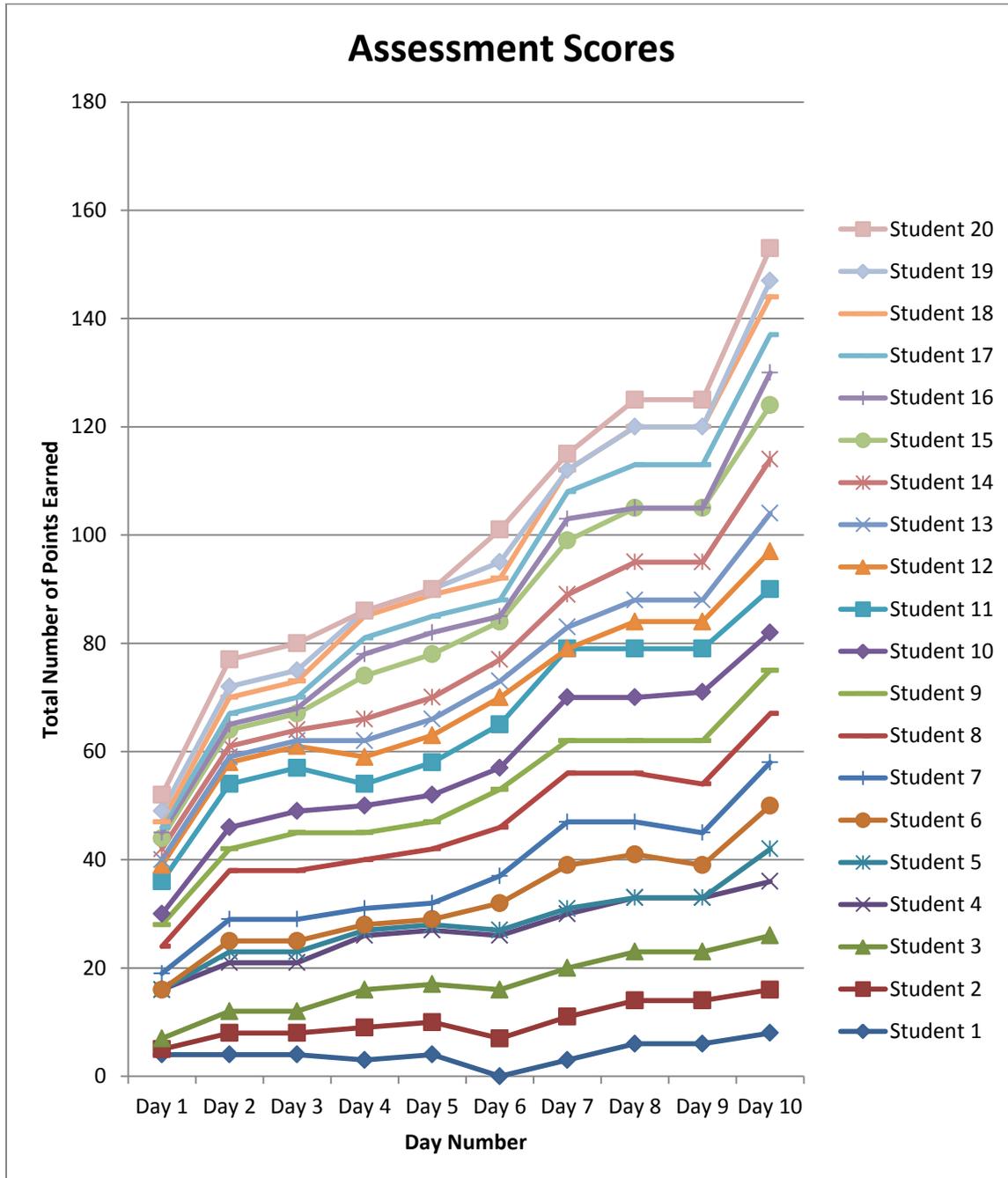
The effects of response cards on students' math assessment scores can be found in Figure 2. The students' assessments were scored out of a maximum of ten points and a minimum of zero points. During the initial baseline, days 1-4, 2 students (10%) scored an average score of a 1.5

students (25%) scored a mean score of 2. 2 students (10%) scored a mean score of a 3. 7 students (35%) scored a mean score of a 4. 1 student (5%) each had a mean score of a 6, 7, 8, and 9.

During the use of response cards, days 5-9, 1 student (5%) scored a mean score of a 1. 2 students (10%) scored a mean score of a 3. 2 students (10%) scored a mean score of a 4. 3 students (15%) scored a mean score of a 5. 4 students (20%) scored a mean score of a 6. 4 students (20%) scored a mean score of a 7. 3 students (15%) scored a mean score of a 9. and 1 student (5%) scored a mean score of a 10. On day 10, when the intervention was removed 1 student (5%) scored a 3. 3 students (15%) had a score of 6. 6 students (30%) had scored a 7. 5 students had scored an 8. 1 student (5%) scored a 9. Lastly, 4 students (20%) scored a 10. The results showed that overall students using response cards helped them increase their assessment scores.

Figure 2 shows the effects of response cards on students' assessment scores.

Figure 2

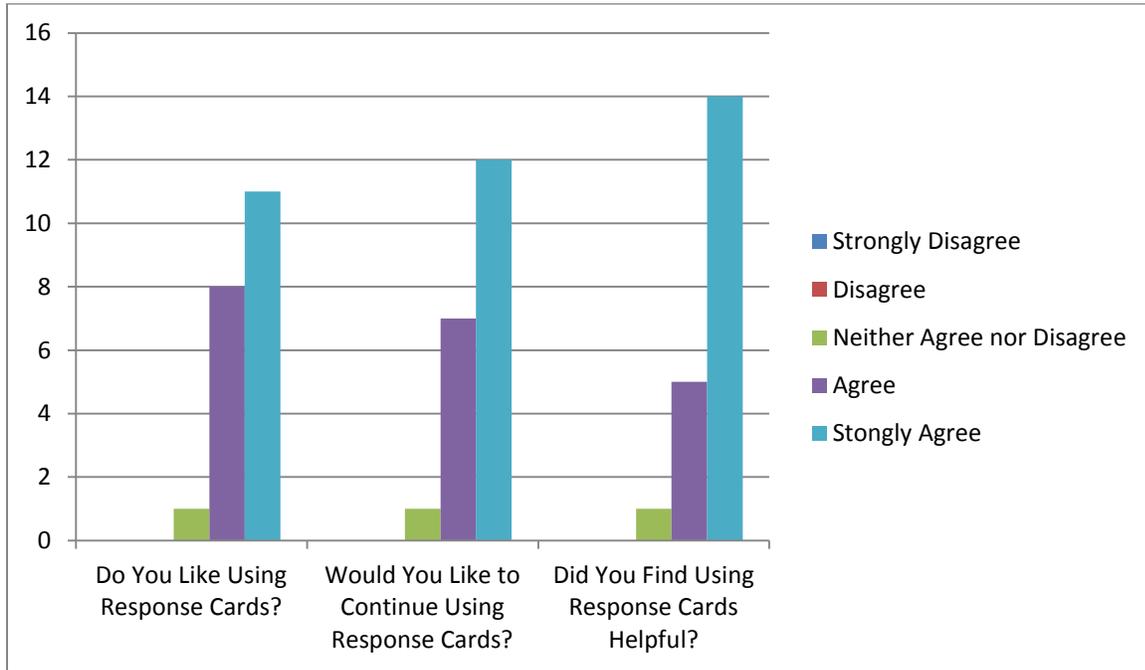


Note- Day 1-4 and Day 10 the students were not using response cards. Day 5-9 the students were using response cards. Also students that were absent received a zero for their assessment score.

When I surveyed the students at the end of my time with them, 8 of the students (40%) “agreed” they liked using response cards to learn time. 11 of the students (55%) “strongly agreed” they liked using response cards. One student (5%) “neither agreed nor disagreed” that they liked using response cards. When asked if they would like to continue using response cards, again one student (5%) “neither agreed nor disagreed.” 7 students (35%) “agreed” they would like to continue using response cards. 12 students (60%) “strongly agreed” they would like to continue using response cards. Lastly, when asked if they found using response cards helpful, 1 student (5%) “neither agreed nor disagreed.” 5 students (25%) “agreed” that response cards were helpful. 14 students (70%) “strongly agreed” that they found using response cards helpful. Overall, the students really enjoyed using response cards; they would like to continue using them and found them helpful.

Figure 3 shows the students feelings on response cards.

Figure 3



Implementing response cards decreased most of students off task behaviors during mathematics class. They also increased students' assessment scores. Additionally, the students really enjoyed using them and the teacher loved being able to collect more data on her students progress quickly. Keeping students active in their learning seems to be the way to go.

Discussion

My thesis project used response cards, laminated clocks and markers, during mathematics class when students were learning about time. The students off task behaviors were tracked on a chart before implementing the response cards and while the response cards were being used. The students' assessment scores were also tracked during this process. At the end of the unit on time, the students were asked to complete a survey using a likert scale, on how they felt while using the response cards.

The present findings showed that the use of response cards produced immediate and significant improvements in a 2nd grade math class' on task behaviors and assessment scores. When the response cards were implemented the percentage of students who were showing on task behaviors increased. Students talking out of turn went from a mean of 5 students down to 2 students. Students touching others decreased from a mean of 2 students to 1 student. Students fidgeting with objects/ having busy hands was unaffected with the use of response cards. The number of students out of their seats decreased by 1 student when response cards were implemented. Students having their head down and daydreaming went from 0 students to 1 student when the response cards were used. Over three-fourths of the class displayed on task behaviors when the response cards were used. More importantly, pupils' accuracy on their assessments improved dramatically. The class' assessment scores, for example, under normal teaching conditions was barely passing (M=70%) and only about four students had grades in the mastery level, 85%-100%. However, when the response cards were being used the mean assessment score percentage of correct responses rose from 40% to 65%. The mean score

although it is not at mastery level, is considered passing. These results are quite consistent with previous research that showed that response cards can: (a) decrease off task behaviors (Armendariz & Umbreit, 1999; Clarke, 2010; Conderman et al., 2011; Duchaine et al., 2011; George, 2010; Godfrey et al., 2003; Heward & and Others, 1996; Lambert et al., 2006; Malanga & Sweeney, 2008; Munro & Stephenson, 2009; Randolph, 2007; Wood et al., 2009), (b) increase students assessment scores, (Blackwell & McLaughlin, 2005; George, 2010; Malanga & Sweeney, 2008; Randolph, 2007), and (c) students enjoy using response cards and find them to be helpful (Armendariz & Umbreit, 1999; Blackwell & McLaughlin, 2005; George, 2010; Munro & Stephenson, 2009; Stowell & Nelson, 2007). Current findings extend the external validity of response cards to a new student population, geographic location, and content area (i.e., 2nd grade math).

Current findings also indicated that a functional relationship existed between the use of response cards and pupils' assessment scores. That is, the use of the cards produced predictable improvements in pupils' assessments performance. When the response cards were used all students answered all questions, each time a question was asked. The active involvement from each child showed a noticeable increase in assessment scores. When the response cards were removed, pupils' off task behaviors increased and assessment scores dropped for some students immediately and noticeably. Identifying class-wide interventions that are effective for all students and easy to implement are very important in an era of evidence-based practices (Conderman et al., 2011).

Significance

Response cards were pretty easy to use and both the teacher and children enjoyed using them. The teacher said the intervention was easy to set up for the students', easy to explain to the students' and easy for the students to use. Response cards allowed the teacher to easily track students understanding of the topics being covered in each lesson. The teacher enjoyed that the students were all encouraged to be active participants for all questions that were asked. The students seemed to enjoy using the response cards. The students were more likely to stay on task and not be disruptive during class when using them. The students enjoyed achieving better scores on their assessments when using response cards as well. Of course, they enjoyed being able to use dry erase markers and laminated clocks. These findings are consistent with previous research that showed positive teacher satisfaction evaluations for response cards (e.g. Armendariz & Umbreit, 1999; Blackwell & McLaughlin, 2005; George, 2010; Munro & Stephenson, 2009; Stowell & Nelson, 2007).

Perhaps one of the most important lessons from this study is that the use of simple class wide interventions can improve student's assessment scores. Once they were given an opportunity to respond to each question asked and knew the teacher would be checking each response given for accuracy, students fully participated and focused more on the lesson. The response cards, therefore, provided sufficient motivation to get all students to participate during mathematics class and stay on task, which increased assessment scores.

Limitations

Although the current findings were positive and encouraging, there are some important study limitations to consider when interpreting these results. First, the study was conducted with

only one group of students (N=20), in one geographical location, and in one subject area (i.e., mathematics lessons dealing with time, off task behavior and assessment scores). Generalizations to other grade levels, geographic settings, subject areas or outcome measures are not warranted at this time. Second, the study was conducted for a relatively short time (10 class sessions) and no generalizations and maintenance data was collected. It would not be appropriate to assume that the same results would be obtained over a longer time frame and/or that the benefits would spread to other areas of students' mathematics performance (e.g. homework grades) and/or be sustained in the absence of the intervention. Future research should include longer intervention durations, more subject areas and more students in various grades and geographical locations.

The present results are limited because the investigator served as the primary data collector and evaluator. Although precautions were implemented to monitor the fidelity of implementation, one cannot rule out potential experimenter bias effects. Future researchers should use independently trained data collectors as much as possible to prevent bias.

Conclusions

In summary, this study examined the effects of response cards on the off task behavior of students during math lessons, their assessment scores and if students enjoyed using the response cards. The study was conducted in a 2nd grade math class in a rural school district in Western New York. Current results indicated that response cards produced higher assessment scores. Additionally, pupils seemed to stay on task and fully participate in each class when response cards were used. These improvements were made with very little extra teacher time used and were loved by the majority of the students. Obviously, much more work needs to be done with

response cards. First, there needs to additional research done. Can the response cards be used effectively in other subject areas and at different grade levels? What other academic, behavioral, and interpersonal outcomes can be improved using response cards? Will teachers continue to use response cards after the research is completed? Will students get tired of using response cards? Will students become more off task when using response cards because they have more to play with during math class? These questions among with many more challenge future practitioners and researchers. In an evidence-based practice time period, teachers need classroom interventions that are able to increase all students' performance and not waste teaching time in the process.

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COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI) HUMAN RESEARCH CURRICULUM COMPLETION REPORT

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LEARNER Heidi Hubert (ID: 3440002)
DEPARTMENT Curriculum and Instruction
PHONE 716-581-0668
EMAIL hube9384@fredonia.edu
INSTITUTION SUNY - College at Fredonia
EXPIRATION DATE 03/23/2015

GROUP 1.

COURSE/STAGE: Basic Course/1
PASSED ON: 03/23/2013
REFERENCE ID: 10014506

REQUIRED MODULES	DATE COMPLETED
Introduction	03/23/13
History and Ethical Principles - SBE	03/23/13
Defining Research with Human Subjects - SBE	03/23/13
The Regulations - SBE	03/23/13
Assessing Risk - SBE	03/23/13
Informed Consent - SBE	03/23/13
Privacy and Confidentiality - SBE	03/23/13
Research with Prisoners - SBE	03/23/13
Research with Children - SBE	03/23/13
Research in Public Elementary and Secondary Schools - SBE	03/23/13
International Research - SBE	03/23/13
Internet Research - SBE	03/23/13
Avoiding Group Harms - U.S. Research Perspectives	03/23/13
Vulnerable Subjects - Research Involving Workers/Employees	03/23/13
Conflicts of Interest in Research Involving Human Subjects	03/23/13
SUNY Fredonia State College	03/23/13

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI Program participating institution or be a paid Independent Learner. Falsified information and unauthorized use of the CITI Program course site is unethical, and may be considered research misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Program Course Coordinator

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Project Title – Response cards

Requested Information

A. Purpose, Research Variables, and Population:

1. Principal Investigator – Heidi Hubert

- Graduate Student (Curriculum & Instruction)

 - B.S. Childhood Education (2012) Minor in Mathematics (State University of New York- Fredonia)

 - Associates Liberal Arts (2008) (Jamestown Community College)
- (See attached cv)

Faculty Sponsor: Dr. Robert L. Dahlgren

- Assistant Professor - Social Studies Education (Curriculum & Instruction)

- Ph.D. (2008) Social Studies Education (University of Florida)

- M.A.T. (1997) Social Studies Education (Simmons College)

- M.A. (1990) History (Boston University)

- B.S. Journalism (1986) Minor in History (Boston University)

(see attached cv)

2. Purpose of the study - The principal investigator in this study proposes to

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study the effects of using response cards in a 2nd grade math class. The students will be observed to see if they participate more using response cards and if they are also on task more. The students' assessment scores will also be used to see if response cards affect the students test grades. At the culmination of the study, the principal investigator hopes to use the results to encourage other teachers to implement response cards in their classrooms. The principal investigator in this study plans to recruit a sample group of 2nd grade students. The investigator plans to observe the sample group to determine their rate of participation and off task behaviors. The investigator will also look at students assessments scores to see how response cards effect assessment scores. At the end of the study, the investigator plans to survey the students using a likert scale to obtain their opinions on using response cards. This research project is thus built around the following research questions: Do response cards decrease off -task and disruptive behaviors in a 2nd grade mathematics class? Do response cards increase student's participation and assessment scores in a 2nd grade mathematics class?

3. Characteristics of the Study Participants -

- a. **Age Range** - Respondents will range in age from 7 to 8.
- b. **Sex** - The study will include both male and female respondents.
- c. **Number** - the study will include approximately 19 participants.

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d. **Inclusion Criteria** - All students participating in Mrs. Bates' 2nd grade math class will be included in the participant pool.

e. **Exclusion Criteria** - No student participants will be excluded from the study participant pool.

f. **Vulnerable Subjects** - Minor children under the age of 18 will be included among the sample of student respondents.

B. Methods and Procedures:

1. Methods of Subject Selection - The principal investigator, following the principles of purposive sampling, will invite all participants to take part in a focus group session at the outset of the data collection process for the study. the researcher will select a group of participants on the basis of the following criteria:

1. All participants will be between the ages of 7 and 8.
2. All participants will have participated in Mrs. Bates' 2nd Grade classroom during mathematics class.

2. Study Site – All focus group sessions will be conducted in the facilities of Brocton Elementary School.

3. Methods and Procedures Applied to Human Subjects -

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- a. The principal investigator will employ methods consistent with the mixed methods framework. A mixed method approach was chosen to see both sides of the story. The principal investigator wanted to be able to observe students and ask their opinions along with assess them. In order to obtain both quantitative and qualitative data mixed methods was used. At the outset of the research project, the principal investigators will observe students behaviors during mathematics instruction (see attached observation sheet). Then the principal investigator will ask approximately 19 student participants to respond voluntarily to an assessment (see attached assessment) The investigator will then ask these participants to use response cards during mathematics lessons. Lastly, the participants will be asked to complete a survey (see attached survey). All sessions will last approximately 50 minutes.

C. Risks/Benefits:

1. Potential Risks - I anticipate that participation in this investigation will greatly enhance the assessment scores and on task behavior students exhibit in math class.
2. Protection Against Risks - As a result of the investigators' understanding of these risks, a number of measures will be employed in order to protect

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against these risks. Students' confidentiality will be protected during this study. Pseudonyms will be used to differentiate the students, and all materials used in this study. All consent forms, observations, assessment scores and surveys will be stored in locked drawers in the researcher's home.

3. Potential Benefits - This investigation will add to the understanding of increasing students' opportunities to respond and their academic grades.
4. Compensation for Participation - There will be no material compensation for participants in the proposed study.
5. Alternatives to Participation - Participation in the proposed study is on a voluntary basis. Thus, there are no alternatives to participation in the study that would be valuable to those participating in the proposed study.
6. Information Withheld - There is no information within the proposed study that will be withheld from the study participants.
7. Debriefing - There is no plan within the proposed study for debriefing participants after the study period in January 2014.

D. Confidentiality:

The principal investigator is committed to the ethical requirements common to

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the field of social research, including the protection of study participants' confidentiality. Pseudonyms will be used to differentiate the interviewees in any subsequent presentations and publications based on the findings from the proposed study. All interview materials will be stored in locked drawers in the researchers' home. Data will be stored for the duration of the proposed research project and will then be destroyed.

E. Copy of Consent Form:

The attached informed consent form will be provided to participants prior to the study. Participation is entire voluntary and participants may withdraw from the study at any point. (See attached informed consent form.)

Principal Investigator's Signature

I approve this protocol for submission to the Research Foundation:

Faculty Advisor

Date