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The Correlation Between Classroom Engagement Strategies and Student Behavior

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Abstract

Shoulders and Krei (2015) conducted a study which revealed that for teachers to be effective in their role, students must be engaged in their learning. The purpose of this study is to examine the effects classroom engagement strategies have on student behavior. There will be three engagement strategies implemented throughout this study, these include turn and talks, cold calling, and *Whole Brain Teaching* strategies. Behaviors that will be analyzed include on-task versus off-task behavior and overall student participation. The participants in this research project include middle school students, 6th through 8th grade. The sample group will consist of 24 students. The academic content area being addressed is mathematics, specifically math intervention. The study will take place during the student's scheduled class time. Direct observations and video recordings will be conducted and analyzed; the video recordings will be stored in a locked filing cabinet in the co- investigator's office.

Chapter One

General Problem/Issue

Teaching can be a tasking job, especially if students are not actively engaged in their learning. [Through my experience as a teacher, it is easy to grow frustrated with the lack of initiative students take in their learning.] This can lead to students becoming bored, even causing them to act out. Teachers then question their effectiveness in the classroom. According to Shoulders and Krei, "The ability to confidently manage a classroom is often mentioned as an important component of effective teaching" (2015).

Not only is it pertinent for all students to be engaged in the classroom, it is critical for struggling learners to be engaged in their education. An article published in *Learning Disabilities & Practice* emphasizes, "If social participation is constitutive of learning, it then becomes evident that teachers must attend to the various interactional routines that shape academic tasks, taking into account the wide range of abilities present in most classrooms, particularly if students with disabilities are included" (Berry, 2006). When struggling learners are unengaged while working through difficult content, these students resort to distractive behaviors throughout the classroom.

Purpose of the Study

The purpose of this study was to determine if the implementation of classroom engagement strategies further improves student involvement, resulting in less opportunity to engage in off-task or inappropriate behavior. As an educator, I have found that when a student's behavior compromises their learning, their success in the classroom rapidly decreases. For teachers to be effective, students must be engaged in their learning. Student achievement is directly linked to student engagement (Shoulders & Krei, 2015).

Rationale of the Study

This research study was to determine if the implementation of classroom engagement strategies played a role in decreasing off-task or inappropriate behavior. The strategies I incorporated were *turn and talks, cold calling*, and *Whole Brain Teaching* strategies. These engagement strategies will be fully implemented through encouragement and positive practices.

Subjects and Setting

Description of subjects. Participants in this study included a total of twenty-three, students. The students included a mix of both sixth and seventh grade students; specifically, ten seventh graders and thirteen sixth graders. The academic content area addressed was mathematics, specifically math intervention. The intervention math curriculum implemented is made up of three levels; this study was solely focused on level one. Level one consisted of a mix of sixth and seventh grades students who tested into intervention math, based upon their spring district assessment results, in addition to their spring screening results. The math intervention setting included a mix of both general education students and students with disabilities. The study included two level one math intervention class periods. The first class included thirteen students and the second class included ten students. The students who participated in the study consisted of both males and females.

Selection criteria. The students in this study included the students who were placed into the two sections of the level one math intervention classes that I am working with during the 2019-2020 school year. The students who participated in this study were selected as a result of their May screening results. The screening was administered by an intervention representative. The screening consists of a baseline assessment which is aligned with our intervention curriculum titled, *TransMath.* The baseline results are evaluated and then compared to the

student's historical district-wide assessment results. If a student earns a score of 50% or lower

on the *TransMath* baseline and the district-wide assessment results reveal a trending data that

place a student below grade level, the student is placed into intervention math.

Description of the setting. The setting took place at a middle school level building. The

school district is that of West Fargo, a vastly growing district in North Dakota. The middle

school includes sixth, seventh, and eighth grade. The school totals 1,182 students. 3% of the

student population are Asian, 14% are African American, 77% are Caucasian, 3% are Hispanic,

and 3% are Native American. The district is currently building another middle school/high

school, as student population continues to rise and exceed the building capacity. 12% of the total

student population receives special education services and a total of 137 students receive math

intervention services. With a large student population, the ability to address challenging

behaviors or conflicts becomes difficult. The number of students who face challenges that

require administrative assistance, outnumber the administrators. Challenging behaviors include:

Aggression, inappropriate language, limited work completion, misuse of classroom materials,

and failure to follow classroom expectations. Administration continues to modify their supports

in order to best accommodate both their student body and staff.

The classroom setting for intervention math is considered a small group setting. The

maximum capacity is fifteen allotted students. Of the twenty-three students who participated in

the study, fifteen of the students are placed on and Individualized Education Plan [IEP]. The two

sections included a total of eight students who identify as Black, two students who identify as

Native American, eight students who identify as Caucasian, and five students who identify as

Hispanic. The participants included a total of nine females and fourteen males.

Research Ethics

  Permissions. Permission to complete this study was obtained from the Institutional Review Board at Minnesota State University, Moorhead and from a district representative for West Fargo Public Schools. The required IRB forms were completed in their entirety. Permission was also obtained from the building level head principal.

  Informed consent. Participants and their parents were informed of the purpose of the research and were made known of any requirements expected of the participants. A consent form was sent home to the parents/guardians for them to read and sign. The consent form stated the risks and benefits of participating in the study and a confidentiality agreement. There was no identifying information disclosed verbally or in writing about the participants to anyone. The participants were informed of their voluntary status in the study. It was communicated to the participants that at any point they were free to withdraw from the study, without repercussions.

Chapter Two

Review of Literature

Research reveals that engaging students in their learning is an effective teaching strategy. Teachers can use a variety of strategies during whole-group instruction to maintain student engagement, gather information to inform future instruction, and monitor student progress (Nagro, Hooks, Fraser, & Cornelius, 2016, p. 243). The three specific classroom engagement strategies, or models, that are the focus of this research study include: *cold- calling, turn and talks, and Whole Brain Teaching*. Engagement strategies that are proactive include all learners, with or without disabilities (Nagro et al., 2016).

Cold calling. Classroom discussion is used as an active learning strategy, the concern being with students not involved in the discussion. The belief is that they are receiving a lower quality learning experience (Dallimore, Hertenstein, & Platt, 2013). *Cold calling* is a strategy utilized to ensure student participation, especially when engaging in class discussion. The term *cold-call* refers to instances in which students are called upon by the teacher, without their hand being raised (Dallimore et al., 2013). Teachers have shared their discomfort with the idea of using *cold calling* as an engagement strategy because they fear that a student who is *cold called* will feel humiliated (Dallimore et al., 2013). It becomes apparent that the students who are confident in their knowledge of the content will continually volunteer to answer questions, while those less confident will remain unengaged.

Dallimore, Hertenstein, and Platt (2013), went on to compare high *cold calling* environments to low cold-calling environments and found that significantly more students answers questions voluntarily in high *cold calling* environments. *Cold calling* can be done extensively without making students feel uncomfortable and high *cold calling* environments

reveal that overtime students find comfort in participating in classroom discussion (Dallimore et al., 2013). The researchers went on to state that "*cold calling* is a way to engage more students actively in class discussions and that it can be done without necessarily making them less comfortable participating" (Dallimore et al., 2013). Overall, *cold calling* is proven to be an effective classroom engagement strategy, which does not affect the ego of the student.

Turn and talks. *Turn and talks*, also known as "Think, Pair, Share," are a cooperative discussion strategy implemented to increase cooperative learning among peers (Kaddoura, 2013). The "Think" portion of this engagement strategy consists of the teacher providing the students with a question, while allowing them time to think of their response. The "Pair" portion of this strategy requires students to find a partner and discuss the answer each came up with. "Share" is to have students share out their conversations with the rest of their classmates (Kaddoura, 2013). This engagement strategy helps students' practice teamwork, in addition to exercising their problem-solving skills (Kaddoura, 2013). Teachers play an important role in creating learning opportunities through discussion, while helping students learn how to participate as sharers and listeners (Hintz & Kazemi, 2014). This overall process does not take much preparation by the teacher, motivates students, and allows an opportunity for quiet students to respond to questions, without having to stand out amongst their classmates (Kaddoura, 2013). "The way teachers and students talk with one another is crucial to what students learn about mathematics and about themselves" (Hintz & Kazemi, 2014, p. 40). Overall, it is important for students to be given time to display their thinking in all content areas and the practice of *turn and talks* is proven to be an effective engagement strategy in all its forms.

Open strategy sharing. "Different discussions serve different purposes, and the discussion goal acts as a compass as teachers navigate classroom talk" (Hintz & Kazemi, 2014).

Open strategy sharing is a more specific form of *turn and talks*. The concept of strategy sharing is explained in detail by Hintz and Kazemi (2014), both researchers for the Journal of Educational Leadership. This engagement strategy allows students to have "think time" and when it seems each student has arrived at a possible solution to the given question, each student shares their answer. When all answers have been shared, students then engage in a turn and talk session, where they discuss one another's solutions. Once the students have shared, the whole class engages in a "strategy share," where different students are called upon to explain how they came to their solution; as the students explain their strategy the teacher writes out the strategies and the expectation is that the students are to make sense of each strategy (Hintz & Kazemi, 2014).

Targeted sharing. Targeted sharing is an extension of strategy sharing. The expectation is that students focus on two of the discussed strategies during open strategy turn and talks (Hintz & Kazemi, 2014). The goal is for students to find similarities between the strategies. The teacher's role is to spark the discussion by asking questions about the similarities and differences, while highlighting certain ideas (Hintz & Kazemi, 2014).

Whole brain teaching. "*Whole Brain Teaching* is a method that integrates an effective classroom management system with learning approaches that tap the way your brain learns best" (Palasigue, 2009). *Whole Brain Teaching* incorporates teaching methods such as, direction interactive instruction and collaborative learning (Biffle, 2015). There are five rules, plus a diamond rule that is practiced for *Whole Brain Teaching*. The rules include: Follow directions quickly, raise your hand for permission to speak, raise your hand for permission to leave your seat, make smart choices, keep your dear teacher happy, and finally the diamond rule, being that you must keep your eyes on the target (Biffle, 2015). When teaching, it's important not to

provide too much help to students, rather it is important to implement *Whole Brain Teaching* strategies that encourage students to pose questions, reason, justify, and be skeptical in their learning (Boaler & Dweck, 2016).

There are a variety of engagement tools incorporated into *Whole Brain Teaching*. A simple attention getter that is encouraged for *Whole Brain Teaching* includes the "Class-Yes" strategy, which includes the teaching saying "class" in a variety of tones and the class responding with "yes" in the same tone that the teacher used (Biffle, 2015). Another engaging strategy utilized in *Whole Brain Teaching* is named "Teach-Okay" strategy, which is closely related to turn and talks. Teach-Okay involves dividing students up into pairs of two, the teacher will provide students with a short bit of information and then clap three times, the students respond by clapping three times and reiterating in their partner pair what the teacher said (Palasigue, 2009). "With *Whole Brain Teaching*, we don't distinguish between classroom management and instructional delivery, rather we manage our classroom by improving instruction" (Biffle, 2015). A graduate student of Marygrove College, who implemented *Whole Brain Teaching* in her classroom, found that there was a 50% decrease in student negative behaviors from the pre-observation to the post-observation, because of *Whole Brain Teaching* (Palasigue, 2009).

Definitions.

For the purpose of this study, the following terms are defined:

Cold calling: The term cold-call refers to instances in which students are called upon by the teacher, without their hand being raised (Dallimore et al., 2013).

Turn and talks: Turn and talks, also known as "Think, Pair, Share," are a cooperative discussion strategy implemented to increase cooperative learning among peers (Kaddoura, 2013).

Whole Brain Teaching: Whole Brain Teaching is a method that integrates an effective classroom management system with learning approaches that tap the way your brain learns best (Palasigue, 2009). Whole Brain Teaching incorporates teaching methods such as, direct interactive instruction and collaborative learning (Biffle, 2015).

Hypothesis

Math intervention teachers who frequently implement *turn and talks, cold calling*, and *Whole Brain Teaching* engagement strategies through a middle school math intervention setting, will experience less student behavior in the classroom than if little or no engagement strategies were implemented. If intervention math teachers incorporate *turn and talks,* then middle school students, sixth through eighth grade, will increase in their display of on-task behavior, thus improving classroom participation. If math intervention teachers incorporate *cold calling* during whole group instruction to middle school math intervention students, then student engagement will increase through asking and answering questions. If math intervention teachers incorporate *Whole Brain Teaching* during whole group instruction, students will actively participate in the learning task.

Chapter Three

Research Question(s)

The question that I posed was: What effect does an increase of classroom engagement strategies have on decreasing student behavior at the middle school level in a math intervention setting? The behaviors included talking during instruction, limited engagement during whole group instruction, limited engagement during partner work, limited engagement during independent work, and off-task behavior. The purpose of this study was to answer three questions specifically related to three classroom engagement strategies and the affects each has on student behavior in the intervention math setting at the middle school level. The three questions are as follows:

1. How does the implementation of *turn and talks* affect student participation or on task behavior during whole group work and partner work?

2. How does *cold calling* affect student engagement, as well as on task behavior through asking and answering questions during whole group instruction?

3. How does the implementation of *Whole Brain Teaching* affect student engagement during whole group instruction?

Participants

The participants included both sixth and seventh grade students at the middle school level. The total number of participants included twenty-three students. The classroom setting was a small group math intervention setting. The students consisted of both general education low level learners and students on an IEP for disabilities in the area(s) of learning disabilities, other health impairments, and emotional disturbance. The participants contained of a mix of both race and gender. The study was conducted by me, the math intervention teacher. Fellow

interventionists assisted in collecting data through observing my teaching, more specifically

observing on-task versus off-task behavior.

Methods of Research

      Research design. The data collected displayed both quantitative and qualitative

characteristics of measurement. Qualitative data includes the observation of student behavior

and teaching behavior. Quantitative characteristics were displayed through the measurement of

on-task verses off-task behavior with the use of a frequency model. Quantitative data was also

displayed through student rating scales, which reflected the connection between student learning

behavior and assessment results.

      Instrumentation. A teacher- made rating scale was administered at the end of each

formative assessment. The rating scale allowed students to self -assess their understanding of the

math standard based off a 3, 2, 1 scale, three being the highest form of understanding. The

second means of data collection was through observation. One focus of the observations was on

student engagement, specifically on-task behavior. On-task data was recorded using a thirty-

second interval recording sheet, with the total observation time being fifteen minutes. General

observations were also be made through observation notes and were focused on positive and

negative student behavior; the observation lasted the duration of the class period. I also collected

data on my teaching through video recordings, while measuring the frequency of my

implementation *of cold calling, turn and talks, and Whole Brain Teaching*, while comparing that

to student behavior.

      Rating scales. The rating scale acted as a student self- assessment tool based off the

student's understanding of the concept. The students ranked themselves using a 3, 2, 1 scale. If a

student ranked themselves with a three, it depicted that the student had a strong understanding, is

confident in their skill of the content, and was meeting the state standard in its' entirety. On the

contrary, if a student ranked themselves with a one, this showed that the student was far less

confident in their skill of the content and had not yet mastered the state standard being assessed.

The student rankings were analyzed to determine if higher rankings occurred when students were

actively engaged in their learning, through the support of engagement strategies. The rating scale

was administered when students were assessed on their understanding of standard based math

concepts that were presently being taught in the classroom.

     Observations. As stated previously, an interval recording sheet was conducted as an

observation tool and was used to measure the participants on-task verses off-task behavior. The

criteria for on-task behavior includes eyes on the speaker, engaging in turn and talks, following

directions the first time they were given, asking or answering questions, and appropriately

completing all required tasks. On-task interval recording took place during the eighth week of

school. At this point, I was modeling and implementing *turn and talks, cold calling*, and *Whole*

Brain Teaching strategies. Time on-task interval recordings were done two times throughout the

research process.

     General observations were made to observe the behaviors that are occurring, both

positive and negative. Examples of behaviors observed include talking during instruction, limited

participation throughout the class period, and other off-task behaviors that occur when students

aren't engaged. The observation consisted of objective notes, which state the specific

observations being made, directly related to student behavior. Observations were made two times

from mid- October to November, when the study was due.

     Video recordings. The video recordings were used as a personal self-assessment tool.

The observations focused on what engagement strategies were being implemented and how

frequently they occurred. I compared the frequency of the implementation of engagement strategies to the number of behaviors that occurred in the classroom. I recorded my teaching in October and again in November. The recordings were used for overall observations of both engagement and student behavior, while tracking the frequency of which I implement the three engagement strategies.

Data Analysis Procedures

The data collection strategy of using an interval recording sheet was meant to measure time on-task, which is relevant when comparing engagement to behavior, both positive and negative. Objectively observing the classroom allowed for me to see what occurred during instruction, with both engagement strategies and student behavior. Using a frequency data collection model was relevant, as it provided a visual for how often I implemented engagement strategies. The use of recording myself, while taking notes of what I observed, allowed for me to see what engagement strategies were most effective for decreasing student behavior and increasing student engagement.

Limitations

One limitation was when students were placed into my classroom halfway through the schoolyear. New students were unaware of classroom norms, routine, and were not yet exposed to the implementation of the classroom engagement strategies incorporated into this study, thus temporarily affecting the classroom environment. Students were also removed from the classroom as a result of high district and state assessment results, class sizes, or behavior. Participants on an IEP also swayed the results, as their disability area contributed to their behavior in the classroom and at times would prohibit them from positively responding to classroom engagement strategies.

Ethical Considerations

One ethical issue took when a student became over stimulated by the pace of the engagement strategies, as well as the volume of the classroom, as a result of their disability area. The video recordings also served as a distraction during the first observations, which took place in October. Students were not negatively impacted by outside observers coming into the classroom to observe.

Protection of human subjects. In terms of protecting the study participants, the use of video recordings can serve as an instant risk, which is why it was pertinent to store this information in an area where only I had access to. I was also sure to delete the recordings, when done with the research. Outside observers can pose a risk, as well. I chose an observer that worked in the building and was familiar with the content being taught, while not posing a risk to the students.

Researcher bias. Research bias has the potential to occur and sway results during outside observations and during interval recording. The outside observer was chosen because they had not yet worked with any of the students in the classes that they observed. As the student's math intervention teacher, I did feel that my experiences or my relationship with specific students would influence my interval recording results; this is why I chose to also have an outside observer come into the classroom and make observations of on-task/off-task behavior.

Chapter Four

Data Collection

For this study data was collected through video recordings, interval task recording sheets, general observation notes, and student rating scales. The purpose of collecting data was to determine the correlation between classroom engagement and student behavior. Video recording was done in both October and again in November. Interval recording also took place once in October and again in November, by an outside math intervention teacher and an ID self - contained teacher. Student rating scales took place a total of four times throughout the study.

Video recording. When observing the two video recordings, I made both general notes on student behavior, as well as tallied the frequency in which I administered *cold calling, turn and talks*, and *Whole Brain Teaching* strategies. The observational notes focused on behaviors such as: eye on the speaker, engaging in turn and talks, following directions the first time they're given, asking or answering questions, and appropriately completing required tasks. During general observations I also took note of off-task behaviors that occurred.

Interval recording. The outside observer was asked to observe two students, both selected by myself, the classroom teacher. Interval recording was done twice throughout the study. The total observation time was fifteen minutes, with on-task versus off-task behavior observations occurring every thirty seconds. The first recording took place during my first period intervention math class and the second recording took place during my third period intervention math class. The students selected were two different sexes and were chosen based off on-task/off-task comparison made previously by my own observations. The first period interval recording compared one sixth-grade female student's behavior and one seventh grade male student 's behavior. The third period interval recording compared a sixth-grade male student's

behavior to a seventh- grade female student's behavior. An "O" was marked to represent on-task behavior and an "X" was marked to represent off-task behavior. See Appendix A.

   Student rating scale. Students filled out student rating scales after each assessment given in both their addition and subtraction units for their math intervention class. The students were asked to rank themselves, based off their results for the given mathematic standard, see Appendix C. Upon circling their ranking, one being the lowest and three being the highest, students were to take a survey that further reflected on the learning behaviors that positively or negatively affected their score. The survey included a total of six questions/prompts; each survey is relevant to the mathematic standards covered in the assessment. The unit one assessment survey results can be found in Figure 4 below. Each question response option is coordinated to match the visual that represents the data found in the survey. A total of twenty-three students were surveyed. Question's two, three, five, and six allowed for students to respond to more than one option. The six questions existing in the survey for each unit are displayed in Appendix B.

Figure 4
Unit One Survey Results

A total of twenty-three students participated in the survey.

1. Did I score a 3 on the number concepts standard that was covered?

   Mathematics 2- Addition

   YES- 19

   NO- 4

2. If I did score a 3, I earned my score because I...

Show on-task behavior in class- 9

Answer questions- 5

Ask questions- 4

Practiced the skill outside of the classroom- 8

I did not score a 3- 4

3. If I did not score a 3, I need to...

Ask questions when I don't understand- 5

Use my class time wisely- 2

Stay on- task- 4

Practice the skill more outside of class- 6

I did score a 3- 19

4. Did I score a 3 on the problem-solving standard that was covered?

YES- 18

NO- 5

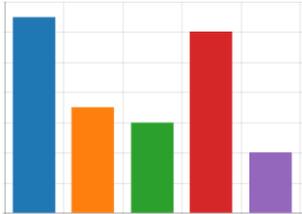5. If I did score a 3, I earned my score because I...
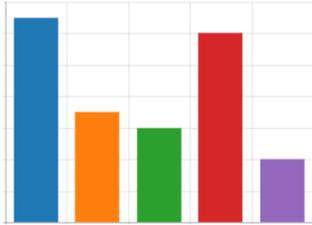
   Show on-task behavior in class- 11

   Answer questions- 8

   Ask questions- 7

   Practiced the skill outside of the classroom- 10

   I did not score a 3- 5

6. If I did not score a 3, I need to...
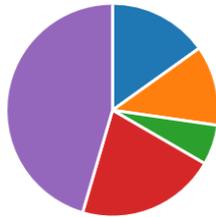
   Ask questions when I don't understand- 4

   Use my class time wisely- 3

   Stay on- task- 1

   Practice the skill more outside of class- 6

   I did score a 3- 18

Results

  Video recordings. I recorded my classroom in both October and November and at two different times in the day, with separate class periods. During the video recordings, I observed the number of times that I implemented the *Whole Brain Teaching* strategy of *teacher versus student*. During the October observation, points toward *teacher versus student* were presented twelve times, with the students earning ten of the twelve obtainable points. During the November observation, students earned fifteen of the eighteen obtainable points. Students earned points for *teacher versus student* by having accurate responses for their whiteboard work, by attending to the task, by appropriate choral reading, and their implementation of *turn and talks*. During the October observation, the implementation of *turn and talks* took place eight times. *Cold calling* took place a total of six times. During the November observation *turn and talks* took place five times. *Cold calling* took place a total of five times, as well. Another engagement strategy that was utilized was *choral reading* and *choral response.*

  Interval recordings. After analyzing the information retrieved through video recordings, interval recordings, and student rating scales, I found there to be a definite correlation between classroom engagement strategies and student behavior. When the expectation became that students were to actively engage in the lesson, there was less opportunity for behavior to occur.

  When reviewing the results of the two, fifteen- minute interval recording sheets, there were limited boxes marked with an "X", which represented time off-task, see Figure's 1 and 2. Also, the students who displayed greater periods of off-task behavior during the two separate observations, are known to exhibit higher energy levels in comparison to grade level peers, across each of their classroom settings.

The first observation done by an outside observer was done during a whole group lesson on estimation. Engagement strategies utilized throughout this observation included *cold calling, turn and talks*, and the *teacher versus student* classroom point system. The teaching model implemented reflected the "I do, we do, you, do" model. Students would first observe the objective being taught. They would then work through practice problems on their individual whiteboards with the teacher. Finally, they would independently work through the math objective independently either on their whiteboards; when students completed their independent work, I would use the *cold call* strategy to review answers, which resulted in points towards the *teacher versus student.*

The second observation was also done by an outside observer. This lesson was focused on fact families. This lesson too followed the "I do, we do, you do" teaching model. The same engagement strategies were exercised, in addition to the implementation of *choral reading* and *choral response.*

Student rating scale. Student rating scales served as both an area of reflection and or accountability for the students, as well as a form of assessment for me, the teacher. Through the student rating scales and the aligned the survey, I was able to determine which students were proficient in meeting the state math standard and those who were not. The most pertinent piece of the rating scale and survey was the learning behaviors. Students who were not proficient in meeting the state math standard were to reflect on what learning behaviors they were currently utilizing, and how that factored into their performance. The results found on the survey revealed that 75% or more of total students assessed, were scoring at a level of proficiency on their unit quizzes and assessments. The survey results based off the student rating scales showed that the students who were performing proficiently were also displaying on-task behavior during

instruction. The students who were not performing at the proficient level most often responded on the student survey that they needed to improve in the areas of asking questions and working on the skill outside of the classroom.

Data Analysis

Research question 1. *How does the implementation of turn and talks affect student participation or on task behavior during whole group work and partner work?*

When analyzing the outcome for the implementation of *turn and talks*, it proved itself to be an effective engagement strategy. *Turn and talks* did not provide immediate results, as the process first had to be modeled and then practiced, before students were independently executing turn and talks. As students began engaging in *turn and talks* with conformity, students started taking ownership in their thinking, thus increasing their math confidence, which in turn kept them engaged in the content. This engagement strategy allowed my higher-level thinkers to re-explain the strategy in their own words, while my lower- level learners could then hear the information again and in a format, they may comprehend more clearly. Current research reveals that *turn and talks* are an effective engagement strategy because the overall process does not take much preparation by the teacher, it motivates the learner, and allows for all students to respond to questions and explain their thinking, without having to stand out amongst their peers (Kaddoura, 2013).

Research questions 2. *How does cold calling affect student engagement, as well as on task behavior through asking and answering questions during whole group instruction?*

Cold calling had both a positive and negative effect on student engagement. This strategy ensured that the same students weren't continuously answering questions, rather it held each student accountable for answering questions. The use of drawing playing cards at random, which

aligned with the students assigned playing cards, kept students accountable for completing each

required task, as they were never sure if their card would be the next one drawn. This

engagement strategy also aligned with *teacher versus student*, as the completion and accuracy of

the *cold call* response positively or negatively affected the score for *teacher versus student*. Each

student felt the pressure coming from their peers, as each student's role was to be actively

engaged in their learning. If a student was not engaged and their card was the card drawn, this

would then result in the teacher earning a point, instead of the student, consequently affecting the

whole class.

I felt that when I incorporated the strategy of *cold calling* with *teacher versus student*, the

strategy became somewhat negative in the eyes of some of my learners. The students that were

not engaged were often the students that were slower processors. When I increased the pressure

placed on student response, the students that have a difficult time processing information became

increasingly anxious about their card being drawn, thus causing them to completely forget the

question or strategy, as their mind is being consumed elsewhere Research says that "*cold calling*

is a way to engage more students actively in class discussion and it can be done without

necessarily making them less comfortable participating" (Dallimore et al.,2013). I would agree

with the research in that *cold calling* holds students accountable, while increasing engagement.

But on the other side of the coin, I felt that this strategy was the least effective for my slow

processors, and for my students who have difficulty sustaining their attention. I also felt that it

tended to make students uncomfortable in their classroom environment.

Research question 3: *How does the implementation of Whole Brain Teaching affect*

student engagement during whole group instruction?

The *Whole Brain Teaching* strategy of *teacher versus student* solidified the other engagement strategies of *cold calling*, *choral response*, and *turn and talks*. This engagement strategy not only held individual students accountable for their engagement in the learning task, but the whole class was affected by the outcome of each person's participation. According to known *Whole Brain Teaching* expert Chris Biffle, "With Whole Brain Teaching, we don't distinguish between classroom management and instructional delivery, rather we manage our classroom by improving instruction" (2015). After conducting this research study, I've found this bit of information to be true, as classroom engagement starts first with the delivery of instruction by the classroom teacher. *Whole Brain Teaching* strategies, such as *teacher versus student* and *choral response* not only improve classroom engagement by holding each student accountable, but also by holding the teacher accountable for their execution of instruction.

Conclusion

Throughout this study, I observed the students in my classroom taking accountability for their learning, while demonstrating an increase in classroom engagement. Prior to this study, nearly all students would complete the required tasks, but with little effort or enthusiasm. It appeared that the same students were attentive and eager to answer questions, while the others were content sitting back and letting their peers take control of the learning environment. Preceding the increase in student engagement, students were more likely to engage in off task behavior, thus disrupting the learning environment. This in turn negatively affected student performance.

With the use of *turn and talks, cold calling* and *Whole Brain Teaching*, more students began performing at a level of proficiency. *Turn and talks, teacher versus student*, and *choral response* seemed to be the most appropriate and effective for most learners in the math

intervention setting, where I teach. Overall, each student was required to put in the work during the duration of the class period, which limited the opportunity that students had to engage in off-task or disruptive behavior.

CHAPTER FIVE

Action Plan

After evaluating the positive results that came from the engagement strategies of turn *and talks, cold calling, and Whole Brain Teaching,* I plan to continue implementing these strategies for the duration of the 2019-2020 school year. I've observed students taking greater accountability for their learning as a result of an increase in student engagement. In addition to the increase in engagement, I've found that the engagement strategies allowed greater opportunity for me to formally assess my student's multiple times throughout the class period.

As I move forward this school year, I would like to increase the number of times that I implement *turn and talks*. The goal that I have set for myself is to implement an opportunity for *turn and talks* every one to three minutes. I hope to facilitate the student's learning, while continuing to stray away from the "sit and get" teaching mentality. I'm finding that the direct instruction curriculum that my district has adopted for intervention math to be rather mundane, providing limited opportunity for students to fully express their thinking; rather they listen to my instruction and "repeat after me". I also would like to frequently switch up the seating arrangement in my classroom to better accommodate *turn and talks*, while being mindful of the relationship and content knowledge of the students who are placed together. Overall, by increasing *turn and talks*, students can learn from one another, while developing relationships.

Although *cold calling* proved to keep students engaged, I found that it also had a way of making students feel insecure about their thinking, as they were afraid of being wrong and looking incompetent in the eyes of their peers. I plan to rarely implement this engagement strategy and rely further on *turn and talks*, *choral response*, and teacher versus student for maintaining student engagement and limiting student behavior.

Plan for Sharing

Throughout my study, I've encouraged my colleagues to observe my classroom. I encourage them to take note of what they see and what questions they may have. My colleagues and I have then found time to meet and discuss the observation. Through this process I've adjusted my teaching as a result of the feedback I've received. I've also pushed into classroom and observed my colleague's teaching; most often this includes fellow interventionists. I've worked with my peers on implementing similar strategies, while adjusting the strategies to be more suitable for their specific classroom and teaching style.

Moving forward, I plan to encourage educators to research various engagement strategies they would be interested in implementing in their classroom. I will also continue to keep my classroom open to my fellow teachers to observe. I also plan to observe my colleagues for further inspiration on how I can continue to increase student engagement, while decreasing student behavior.

LIST OF FIGURES

APPENDIX A

O – on
x – off

On-task Observation Form: Student and Peer Comparison

Student:	School: LMS	Observer: Baylie Peterson
Date: 10/25	Grade:	Teacher: Abby Neppl
Begin time: 8:50	End time:	Activity: Fall Task cards
Total observation time:		On-task definition:

M
f

3-minutes	:30	1:00	1:30	2:00	2:30	3:00
Student	O	O	O	O	O	O
Peer	O	O	X	X	O	X

6-minutes	3:30	4:00	4:30	5:00	5:30	6:00
Student	O	O	X	O	O	X
Peer	O	O	O	O	O	O

9-minutes	6:30	7:00	7:30	8:00	8:30	9:00
Student	X	⊠	X	X	X	X
Peer	O	O	O	O	O	O

12-minutes	9:30	10:00	10:30	11:00	11:30	12:00
Student	X	O	O	O	O	X
Peer	O	O	O	O	O	O

15-minutes	12:30	13:00	13:30	14:00	14:30	15:00
Student	O	O	O	O	O	O
Peer	O	O	O	O	O	O

on
M: 21
F: 27

off
m: 9
F: 3

APPENDIX A, continued

On-task Observation Form: Student and Peer Comparison

Student:	School: LMS	Observer: Shelby Bachmeier
Date: 11 / 6 /2019	Grade:	Teacher: Abby Neppl
Begin time:	End time:	Activity: Fact Families.
Total observation time:		On-task definition:

3-minutes	:30	1:00	1:30	2:00	2:30	3:00
Student	O	X	O	O	O	X
Peer	O	O	O	O	O	X

6-minutes	3:30	4:00	4:30	5:00	5:30	6:00
Student	X	O	X	O	O	O
Peer	O	O	O	O	O	O

9-minutes	6:30	7:00	7:30	8:00	8:30	9:00
Student	O	X	X	X	O	O
Peer	O	O	O	X	O	O

12-minutes	9:30	10:00	10:30	11:00	11:30	12:00
Student	O	X	X	O	O	O
Peer	O	O	X	O	O	O

15-minutes	12:30	13:00	13:30	14:00	14:30	15:00
Student	O	X	X	X	X	O
Peer	O	X	X	X	X	X

APPENDIX B

1. Did I score a 3 on the number concepts standard that was covered?

  2. If I did score a 3, I earned my score because I...

  3. If I did not score a 3, I need to...

  4. Did I score a 3 on the problem-solving standard that was covered?

  5. If I did score a 3, I earned my score because I...

  6. If I did not score a 3, I need to...

APPENDIX C

TransMath Level 1, Unit 1

Standard	1	2	3
Mathematics 2 **Addition** **Quiz 1 – Part 4** **Quiz 2 – Part 2** **UA – Part 6**	Adds in basic and expanded forms consistently with errors and does not recognize errors.	Adds in basic and expanded forms consistently with or without errors AND recognizes errors BUT is not able to correct.	Adds in basic and expanded forms consistently with no errors OR recognizes errors AND is able to correct.
Mathematics 5 **Working with Data** **Quiz 1 – Part 5** **Quiz 2 – Part 4** **UA – Part 7**	Cannot identify the word problem.	Can identify the word problem with supports.	Is able to identify what the word problem is asking without supports.

APPENDIX C, continued

TransMath Level 1, Unit Two

Standard	1	2	3
Mathematics 2 **The Number System** **Subtraction** **Quiz 1 Part 1** **Quiz 2 Part 2** **UA Parts 2 & 4**	Subtracts in basic and expanded forms consistently with errors and does not recognize errors.	Subtracts in basic and expanded forms consistently with or without errors AND recognizes errors BUT is not able to correct without adult assistance.	Subtracts in basic and expanded forms consistently with no errors OR recognizes errors AND can correct without adult assistance.
Mathematics 5 **Working with Data** **Quiz 1 Part 4** **Quiz 2 Part 3** **UA Part 6**	Cannot analyze data in a bar graph or table AND cannot determine when to use estimation.	Can analyze data in a bar graph or table with supports AND is able to determine when to use estimation with supports.	Can analyze data in a bar graph or table without supports AND is able to determine when to use estimation.

APPENDIX C, continued

TransMath Level 1, Unit 3

Standard	1	2	3
Mathematics 2 The Number System Multiplication Q1 – Part 2 Q2 – Part 2 UA – Part 5	Student does not multiply accurately with consistency.	Student consistently makes errors BUT is able to correct after the teacher has showed the errors. OR Student may recognize when they make an error but are not able to correct even with reteaching.	Student consistently multiplies with accuracy. OR Student recognize when they make errors and are able to correct them without reteaching.
Mathematics 2 Applying Multiplication to a Model Q1 – Part 4 Q2 – Part 5 UA – Part 7	The student does not accurately multiply the area of a given model. OR Does not apply multiplication to data analysis.	The student shows one or more of the following errors: -Calculation errors -Multiplies the wrong number from a data table -Uses the wrong measurements	The student accurately multiplies the area of a given model without error. OR Students applies multiplication to data analysis.

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