USING APPRECIATIVE INQUIRY AS A MODEL TO ENCOURAGE STUDENTS TO BECOME ACTIVE LEARNERS IN MATHEMATICS

by

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July 2012
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Jennifer Rachel Narimatsu

July 2012
DEDICATION

I would like to dedicate this paper to the eight students that participated in this research project. They were very helpful, willing and understanding with participating in this project. I would also like to thank my colleagues, Debbie and Janet for helping edit and discuss my project throughout the school year. I also want to thank my family for allowing me to have the time to work on this research paper and ultimately allowing me to become a better teacher.
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ABSTRACT

This research project was based on the concepts of positive psychology and Appreciative Inquiry as a model to encourage students to become self-motivated lifelong learners. Students were given the opportunity to explore and reflect on their personal strengths and learn ways to excel in their educational careers by using their strengths in their daily lives. Classroom activities focused on positive results and remarks instead of focusing on the negative and poor choices that were made.
INTRODUCTION AND BACKGROUND

For the past three years, I have been teaching seventh grade mathematics at Fairview Junior High, located in Bremerton, Washington. Prior to moving home to Bremerton, I taught seventh grade science for two years at Wapato Middle School located in Wapato, Washington. Fairview is one of three public junior highs in the Central Kitsap School District and is comprised of seventh, eighth and ninth graders. As of October 2011, there are 671 students enrolled, with a majority of the students identified as White or Two or More Races (Washington State Report Card). In 2010, Fairview became a Title I school because 42% of the student population qualifies for free or reduced-price meals (Washington State Report Card).

In 2010, the Central Kitsap School District adopted a new mathematics curriculum. The district went from the Connected Mathematics Program (CMP), which is based in an inquiry-style learning of mathematics to Holt (Course 2), which is a more traditional skills-based curriculum. Teachers wanted a curriculum that had a stronger emphasis in the acquisition and strengthening of basic math skills as the main curriculum. Having a curriculum that was based on the math skills; teachers were able to implement the inquiry lessons instead of having an inquiry-based curriculum and needing to implement the basic math practice.

Fairview completed the second year of the textbook implementation in June 2012. Learning to teach a traditional curriculum from an inquiry-based curriculum has brought much frustration to the math department. Teachers enjoyed facilitating the learning that was evident during the CMP lessons; and having to teach a very dry traditional lesson led
teachers to become unenthusiastic about the daily lessons. Students throughout the school became apathetic towards their assignments because they were based on repetition of the basic skills and did not require students to use higher-order thinking skills that were central to CMP.

Many departmental meetings were centered on the lack of effort put forth by the students; minimal work ethics translated to poor grades in math. We frequently discussed the association between the rate of homework completion and the grade a student earns on his/her chapter tests. During the second year of the Holt curriculum, teachers noticed throughout the school that students came to the classroom with a stronger understanding of the foundational math skills required to build upon for students to be ready for the three high school credits of math that are now a graduation requirement in Washington State. Part of my study focused on motivating students to take responsibility of their learning by completing their nightly assignments for math class.

When I got a job as a math teacher I was disappointed because I whole-heartedly enjoyed teaching science. Since I was no longer teaching science, I wanted to study a method of teaching that required me to learn and change as an individual. Discussing this project with my principal led me to researching Appreciative Inquiry as a model for my project. My principal told me that I am a ‘natural cheerleader’ at Fairview and that radiate a positive outlook on life that is contagious to those around me. Through researching Appreciative Inquiry I have discovered different applications of positive psychology.
Positive psychology is a focus on the best of each person, task, or event and building on the strengths that are already in existence instead of trying to fix what is wrong. By researching Appreciative Inquiry I was inspired to attempt to find the best of my seventh grade students that are identified as mathematically challenged and motivate them to always try their best and to attempt their assignments, no matter how difficult they were.

**Focus Question**

The purpose of this study was to help students identify their unique strengths through an Appreciative Inquiry process, and to see if emphasizing their strengths would increase student success and motivation. My research questions are:

1. Will students be more successful on mathematics tests if their unique strengths are emphasized in class?
2. Does a positive atmosphere and constant encouragement in a classroom increase student motivation in mathematics class?
CONCEPTUAL FRAMEWORK

Appreciative Inquiry is an organizational tool to facilitate positive change by focusing on what works rather than trying to fix what does not work (Doveston & Keenaghan, 2006). Appreciative Inquiry is the ideology that there is beauty or good to be found in every living creature, and like a living creature, every organization. Walker and Carr-Stewart (2004) describe appreciation as “affirming strengths, potentials and possibilities;” (p.72) as well as adding value to all circumstances and appreciating the best in people. Inquiry is a strategy of using personal reflection and discovery to create learning that each member of the program can bring a sense of openness and belonging to the group environment (Walker & Carr-Stewart, 2004).

To use Appreciative Inquiry as a model for change, one must have an understanding of the assumptions of Appreciative Inquiry (Hammond, 1998):

- In all organizations or groups there is something that works.
- Whatever the group focuses on becomes reality and there can be multiple realities.
- “People have more confidence and comfort to journey to the future (the unknown) when they carry forward parts of the past (the known)” (1998, p.21). What should be carried forward are the best parts of the past.

From these generic assumptions a multitude of techniques have been established. One of most used methods follows the 4D cycle; discovery, dream, design and destiny (Bright, 2009; Chapman & Giles, 2009; Elleven, 2007; Moore, 2008; Willoughby &
Tosey, 2007). Some groups add the fifth dimension of define to this four-dimensional analysis (Bright, 2009).

In the discovery phase participants are asked to recall the best moments from their past experiences in that organization (Chapman & Giles, 2009). This involves identifying provocative questions to get participants to think about what has worked well for them in their past experiences. This is the step where the “best” of the organization is discovered and participants will begin to see similarities in what works well for the group (Elleven, 2007).

The dream phase is where participants strive to envision ‘what might be’ (Hammond, 1998). Participants are asked to consider what the organization could look like if focus was placed in the organization’s strengths instead of their weaknesses (Chapman & Giles, 2009). Participants are then invited to share their personal hopes and stories to create a common goal towards the future of the organization. Part of the power of Appreciative Inquiry is the value placed on personal stories and the “process of describing and speculating upon actual stories” (Giles & Alderson, 2008, p. 469).

After a vision is created by the group, a plan is designed to implement the discoveries that were made by the group in the dream phase. In this step, it is possible groups will need to discuss a change in the group environment or culture in order to successfully facilitate the changes that were agreed upon by the group (Elleven, 2007).

The last, and most crucial, phase of the cycle is the destiny phase. In this step the group is tasked with implementing and sustaining what was accomplished in the prior
phases. This step requires frequent feedback from members with the assumption of returning through the cycle as new changes are needed.

Appreciative Inquiry was originally developed for use in the business world, but it is easily adapted for use in a wide range of facilities, such as medical facilities, community-centered organizations and in the educational system (Onyett, 2009). “Appreciative Inquiry is more than a focus on the positive; it is the creation of conditions that tap the generative potential of people and organizations” (Bright, 2009, p. 2). The goal of educators in our society is to provide the skills and tools necessary for the future generations to be successful in our world. Students should be given the opportunity to build and recognize their strengths in order to excel in our society and throughout the world. By using the theories of Appreciative Inquiry, educators can have a renewed sense of purpose and understanding of the nature and purpose of being an educator (Giles & Alderson, 2008).

In order to provide the very best for students the educators must facilitate an understanding in the students that they are responsible for their own learning; in essence to create lifelong learners. “Appreciative Inquiry is for those persons involved in student affairs who want to explore and discern the best possible outcomes for their organization and thus for their students” (Elleven, 2007, p. 453). A key aspect to helping students make an investment in their own personal learning is to allow the students to connect to one another and to the teacher. Allowing the time and opportunity for having personal relationships with a student can have a positive impact on their educational experience, both academically and socially (De La Ossa, 2005). By having that sense of community, the students create a classroom that is supportive and where questions can be asked
without a fear of judgment from their peers and/or from the teacher (Giles & Alderson, 2008).

Application of Appreciative Inquiry as a model for change and success in a classroom, can be described as a way of constantly phrasing questions in a positive manner that increases the potential for positive outcomes in the organization, or in this case, the success of students (Calabrese, 2006). Students may feel unsuccessful on a personal level because it is difficult to reach the ideal of being perfect. “We are conditioned to be rather ordinary,” states Bright (2009, p.4), it is difficult to remain at either end of the continuum as an ‘utter failure’ or as a ‘perfectionist’. Through using the reflective dialogue and the personal stories, students become invested in their own personal learning. By doing this students that internally feel they have never achieved anything before to find moments in their learning where they have been successful (Giles & Alderson, 2008).

Allowing students the opportunity to realize that they are successful on one level or another can cause a chain reaction in the atmosphere of a school. When students take ownership of their learning, they in turn will show more pride in themselves, in their school, and in their community. “By using this type of research approach (Appreciative Inquiry), students today can be the designers of effective alternative and traditional high schools of the future” (De La Ossa, 2005, p. 37).

In using Appreciative Inquiry as part of the classroom structure, students play an important role in deciding the dynamics of the classroom atmosphere. It creates an inviting space where students are not only comfortable in talking and sharing their
dreams and beliefs, but hey want to share them on a daily basis. “Using Appreciative Inquiry in social systems such as classrooms creates opportunities for students and teachers to voice their thoughts, ideas, hopes and aspirations in the creation of the ideal learning experience” (Conklin, 2009). Students are given examples and opportunities for metacognition and acquiring internal dialogue that is encouraging and positive instead of negative and pessimistic. In developing an optimistic internal dialogue, students are engaged in building intrinsic motivation, thus inspiring students to take bigger risks in the classroom and tackling challenging problems instead of shying away from them.

In a classroom that applies the philosophies of Appreciative Inquiry, the teacher is not just a teacher and the students are not just a handful of the faces that the teacher will see in a day. There is a culture and a strong relationship that is built between the students and the teacher, as well as between each of the students. Every person the the room brings something amazing and different to the dynamics of the classroom. Each person is not only tolerated, but accepted and recognized as one of the group because of their individual abilities and what they contribute to the classroom.

Appreciative Inquiry allows for all students to look within themselves and find at least one moment in their lives that was extraordinary. Finding that one moment of success allows for the creative planning and implementation of educational experiences that are rooted in positive past experiences (Giles & Alderson, 2008). Students with a strong foundation based on past experiences have a reason to become self-confident, motivated, high-achieving, and successful in their personal and academic lives.
METHODOLOGY

During the 2011-2012 school year, I was assigned to one Math Lab and three seventh grade math classes (Holt, Course 2). Twelve students were in my first period Math Lab and also were enrolled in Course 2 later in the school day, with one of three teachers. For this study, I focused on eight students that were in my Math Lab and Course 2 class. There were four students in Math Lab that were not in my Course 2 class and did not participate in the treatment.

Students that were placed into Math Lab were chosen for a variety of reasons. At the end of the prior school year, students took a district created placement test as well as the Measures of Student Progress (MSP) which is the state mandated test. Students were also considered for placement in Math Lab by recommendations from their sixth grade teacher, or by the request of parents.

At the beginning of the school year, all students across the district took a pretest of the grade level math skills to determine a baseline of what knowledge the students already have, and to check if they received an appropriate placement for the school year. This pretest is the same test that students take as their course final at the end of the school year.

One reason that the district implemented the pretest was to collect data to prove whether the new curriculum was a good purchase for the district. Before adopting the Holt curriculum, there was not a common district-wide test to monitor student achievement. The district used classroom based assessments and the MSP or Washington Assessment for Student Learning (WASL, the first Washington State mandated
assessment). The school district also created a common midterm exam that covers the topics from the first semester of the school year and is not the same as the pre and post-test, but all teachers were strongly encouraged to use it.

I used the scores of pretest to midterm and pretest to post-test as two of the math tests compared to show growth. At the beginning of the treatment period, I used the scores of pre-test to midterm as a motivational piece for the students in Math Lab. Students assigned to my Course 2 classes did not pass the pretest. Any students in the district that achieved a score of 75% or higher on the pretest were considered for advanced placement in the Course 3 or Algebra I classes.

As part of the supplemental materials for Math Lab, students took a remedial mathematics skills inventory test in September, February and May. Students were given two days to complete the multiple choice test and were only allowed to use scratch paper to solve their problems. The test covered eight different mathematical topics; whole numbers, decimals, number theory and fraction concepts, operations with fractions, geometry, ratio proportion and percent, measurement and pre-algebra concepts. The test had 50 questions that were multiple-choice to generate a list of areas where students had holes in their mathematical knowledge. For the purpose of showing growth of the students’ foundational math knowledge, I compared the percentage of correct answers of the cumulative placement test. When new students were added into the class, the first thing they were required to complete is the inventory test.

In October there was an overhaul of the science classes that caused some of my students to switch into different class periods. I originally had Barbara, Edward, Susan,
and Peter in my Course 2 classes, but after the changes in October I lost Edward and Susan to another Course 2 math teacher and I gained Johnny. I also received half of a different Course 2 teacher’s fifth period class because one of the eight Course 2 classes were dissolved. At the beginning of the second semester, I requested a transfer of my Math Lab students into one of my Course 2 mathematics classes, and I had some students transfer over to a different Course 2 teacher to keep the numbers equal. I added Edward, Susan, Kara, Tony and Ben to my Course 2 class. This allowed for me to have eight students in my math lab and in my corresponding Course 2 class, I was able to closely monitor those students and track their grades in a way that was useful for my research project.

Pre-treatment, I collected data on attitudes about mathematics, with an I am a Mathematician interview about their personal relationship with mathematics (Appendix A). Students were asked questions that required them to reflect on some of their earliest interactions with math and what caused them to like or dislike math. At first, the students were given one class period of 55 minutes to think about and answer the interview questions. A week later, I interviewed small groups of students about their memories and prior interactions with mathematics.

At the start of the treatment period, students were given a Mathematics Snapshot to gauge their personal feelings towards math (Appendix B). The Mathematics Snapshot is a set of attitude scales with 14 statements that students were asked to respond with strongly agree, agree, disagree, or strongly disagree. Questions 1 and 10-14 were written as negative statements that if a student disagreed with the statement, it
represented a positive response. Questions 2-9 were written as positive statements so that when a student responded with agree it represented a positive response.

Students were also given the Mathematics Snapshot at the end of each unit to monitor any association with the concepts that were taught and to measure their perceptions of math over a six-week period. During the last week of treatment, students were given the Mathematics Snapshot daily. On the very last day of the treatment, students were given the Mathematics Snapshot during first period prior to taking the chapter test, and after they had finished the chapter test later in the day. I gave the Mathematics Snapshot a total of eight times throughout the treatment period. I collected the snapshot each time and recorded the information to monitor whether students were feeling confident in their Course 2 class during the trial period.

As part of the treatment, and to promote a positive learning environment and to encourage students to be self-confident individuals, the class participated in a strength building exercise during math lab. Students were asked to think about a memory from their pasts that they made happen and that they were proud of and were instructed to draw a picture of that memory using the Student Strength Activity (Appendix C). To allow ample time for self-reflection, students were instructed to not discuss their stories over the two days of the activity.

After the students finished drawing their memories they each had the opportunity to share their picture in front of the class and to tell us their stories. While the students were telling their stories, the rest of the class was writing personal vocabulary lists of strengths that each person had exhibited during their chosen memory. We each took
turns verbally sharing our found strengths and then gave our lists to the storyteller. Each storyteller had thirteen lists of words to choose ten strengths from.

The last step for each student was to pick ten words that they felt best described themselves. Once they picked their ten words they filled out *My 10 Strengths* and developed a personal definition and an idea of how to use that strength at school (Appendix D). I then created a word cloud for each student that included their ten strengths to put in their binder as a daily reminder of their personal strengths. This strength-finding activity took a week to complete during Math Lab.

During Course 2 classes, all students were given a *Daily Self-Reflection Exit Slip* (Appendix E). By using these exit slips I was able to quickly assess whether students felt comfortable with that day’s lesson or if I needed to conference quickly with the students about what they didn’t understand. Students were asked three reflection questions about the daily lesson and whether they had any questions from that lesson. If they did have questions or were not confident in the lesson, I was able to respond to the student with either a note on the back of the exit slip, or spoke to them briefly in person. If they did not have any questions or concerns I recorded in my notes that the individual had fully participated in the lesson for that day. When I saw that students were feeling uncomfortable with the lessons, I was able to talk to them one-on-one during the first few minutes of class, during study hall or during Math Lab.

Throughout the treatment period I maintained an expectation that all students have no missing assignments in their Course 2 class. By focusing on a positive attitude during Math Lab, I expected that the students participating in this study would have their
assignments ready to turn in on a regular basis. When students did not have their assignments ready to hand-in, they were required to contact their parents to let them know that they did not complete their assignment and were ill prepared for the day’s lesson. I tracked student assignments for all of third quarter to see if there was any change over the six-week treatment period. Students were graded on whether they had turned in the assignment on time, late, or whether the assignment was never completed and remained missing.

As part of the treatment to increase student motivation, I had student each select a superhero for their alter-ego to use as pseudonyms for anonymity when showing data displays. All graphs were shown including the pseudonym. Permission slips were signed by the parents of all the students involved in the study.

Students in Math Lab participated in all of the data collection tools. Some of the activities took place in Math Lab only. Two of the activities were specific to Course 2 classes only. Pre and Post-tests were given across the district and their data was collected by the district for the Course 2 pre, mid, and post-tests. Teachers at Fairview used the same chapter tests for all of the seven Course 2 classes. Figure 1 is a visual representation of which students participated in the data collection tools that are shown in the Triangulation Matrix (Table 1).
Figure 1. Visual of which students participated in the data collection tools.

Table 1
Data Triangulation Matrix

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Math Lab Students</strong> I am a Mathematician Interview Student Strength Activity My 10 Strengths Follow-up Interview</td>
<td></td>
</tr>
<tr>
<td><strong>Course 2 Students</strong> Homework Completion Daily Reflection Exit Slips</td>
<td></td>
</tr>
<tr>
<td><strong>All Students in the District</strong> Pre &amp; Post-tests</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will students be more successful on mathematics tests if their unique strengths are emphasized in class?</td>
<td>Homework Completion Daily Reflection Exit Slips Pretest &amp; Post-tests</td>
</tr>
<tr>
<td>Does a positive atmosphere and constant encouragement in a classroom increase student motivation in mathematics class?</td>
<td>I am a Mathematician Interview Student Strengths Activity My 10 Strengths</td>
</tr>
<tr>
<td>Mathematics Snapshot Homework Completion Rate</td>
<td>Follow-up Interview</td>
</tr>
</tbody>
</table>

The length of the treatment period was over three consecutive units in our mathematics curriculum during; a six-week period. The concepts taught during this time
period were Percentages, 2-Dimensional Figures, and 3-Dimensional Figures. I also monitored student scores for one more unit, Probability, to note whether the treatment made a difference in the students’ learning habits. Data was collected throughout 3rd Quarter, for a total of one quarter of the school year. The research methodology for this project received an exemption by Montana State University's Institutional Review Board and compliance for working with human subjects was maintained.

DATA AND ANALYSIS

The purpose of this study was to help students identify their unique strengths through an appreciative inquiry process, and to see if emphasizing their strengths would increase student success and motivation. The following sections will outline what strengths were identified for each student, and how students’ success and motivation was affected throughout the appreciative inquiry process.

What Strengths do Students Have?

To help students identify their innate strengths, the *I am a Mathematician Interview* (Appendix A), the *Student Strengths Activity* (Appendix B), and *My 10 Strengths* (Appendix C) were used. During the *I am a Mathematician Interview*, five of the eight students answered all of the questions on the interview. Two of the students answered the first four questions and one student answered only the first six questions.

The first question asked students to explain their first memories about math, and more specifically when and how they learned to count. Seven of these eight students indicated a positive first memory of learning how to count. For example, Ben indicated
that he learned to count, “when I was watching TV.” These eight Math Lab students expressed that they learned to count to 100 over a range of five years; from an age of four years to nine years.

When asked who taught the students’ how to count, they all were able to name a specific person. Four of the students indicated that they were taught to count by a family member and the remaining four said they were taught by a teacher. Later in the interview, students were asked if there was a specific person that helped them to like or understand math better. All five students that answered that question said yes, that there was someone that helped them. One of the four students did not list a family member as the person who had helped them with math.

All eight of the students indicated that at one point in their lives that math was a topic they considered to be fun and enjoyable. Three of the students indicated that they still liked math, but it was not an easy subject for them or that it was sometimes extremely difficult for them to consider themselves successful at mathematics.

During the Student Strengths Activity many of the stories that the students presented to the group were about sports and being active which led to many strengths related to their own athletic abilities. Edward told us about climbing the tallest tree in his neighborhood by himself. Johnny’s story related to playing a videogame to completion. Kara’s story was about the time she scored a goal for her soccer team. Susan told a story about driving her mother’s car at the age of seven and parking it in the parking lot. Tony told us about the first time he was able to tie his shoe. Peter explained that he used to be on a competitive rock-climbing team and that he was proud of all the sponsorships that he
encouraged to support his team. Barbara told us a story about rescuing a kitten that was wandering around the neighborhood. Ben told us about hitting a home run for his baseball team. See Appendix F to view the Student Strengths Activity pictures.

After creating a list of their 10 strengths, the students were asked to define what each word meant to them and how they could use that skill at Fairview Junior High (Table 2). For example, Susan defined perseverance as, “to do in spite of difficulties”; and said that she could use this strength “to do homework.” Kara defined caring as, “I have a heavy sense of responsibility,” and said she would use that strength for “doing a better job to watch over my homework.” One of Peter’s strengths was brave and was defined as, “that I’m not afraid to do what I want,” and can be used at school by “asking teachers for help.”

Table 2
Math Lab Students’ List of Strengths

<table>
<thead>
<tr>
<th>Tony</th>
<th>happy</th>
<th>self-confident</th>
<th>grateful</th>
<th>endures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>independent</td>
<td>accomplished</td>
<td>learner</td>
<td>creative</td>
</tr>
<tr>
<td>Susan</td>
<td>risk-taker</td>
<td>skillful</td>
<td>talented</td>
<td>proud</td>
</tr>
<tr>
<td></td>
<td>athletic</td>
<td>active</td>
<td>brave</td>
<td>fun</td>
</tr>
<tr>
<td>Edward</td>
<td>brave</td>
<td>acrobatic</td>
<td>risk-taker</td>
<td>friendly</td>
</tr>
<tr>
<td></td>
<td>strong</td>
<td>confident</td>
<td>adventurer</td>
<td>competitive</td>
</tr>
<tr>
<td>Peter</td>
<td>strong</td>
<td>endures</td>
<td>individual</td>
<td>brave</td>
</tr>
<tr>
<td></td>
<td>fun</td>
<td>competitive</td>
<td>risk-taker</td>
<td>resourceful</td>
</tr>
<tr>
<td>Ben</td>
<td>funny</td>
<td>serious</td>
<td>leader</td>
<td>talkative</td>
</tr>
<tr>
<td></td>
<td>strong</td>
<td>comedic</td>
<td>competitive</td>
<td>athletic</td>
</tr>
<tr>
<td>Barbara</td>
<td>nice</td>
<td>caring</td>
<td>fun</td>
<td>giving</td>
</tr>
<tr>
<td></td>
<td>loving</td>
<td>generous</td>
<td>family</td>
<td>successful</td>
</tr>
<tr>
<td>Johnny</td>
<td>gamer</td>
<td>fun</td>
<td>competitive</td>
<td>top-dog</td>
</tr>
<tr>
<td></td>
<td>endures</td>
<td>individual</td>
<td>creative</td>
<td>family</td>
</tr>
<tr>
<td>Kara</td>
<td>strong</td>
<td>team-player</td>
<td>caring</td>
<td>competitive</td>
</tr>
<tr>
<td></td>
<td>happy</td>
<td>active</td>
<td>risk-taker</td>
<td>content</td>
</tr>
</tbody>
</table>
Effects on Student Motivation

Student motivation was measured using *Mathematics Snapshots* to see if the increase of a positive atmosphere and constant encouragement in the classroom increased motivation. Additionally, homework from the Course 2 class was analyzed for an increase in motivation. Students in Math Lab also participated in an informal follow-up interview at the end of the treatment.

The questions that had the most consistently negative responses were Q4, Q6, Q8, Q3, Q5, Q10, Q14 and Q7 respectively (Table 3). Two of these questions related to whether the student does their math for fun and enjoyment. Four of these questions were based on how the student felt they did in their classes academically. Two questions were based on their personal feelings of math and how they felt in their math classes.

<table>
<thead>
<tr>
<th>Question</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q4</td>
<td>I have always believed that Mathematics is one of my best subjects</td>
</tr>
<tr>
<td>Q6</td>
<td>I enjoy reading about Mathematics</td>
</tr>
<tr>
<td>Q8</td>
<td>I do Mathematics because I enjoy it</td>
</tr>
<tr>
<td>Q3</td>
<td>I learn Mathematics quickly</td>
</tr>
<tr>
<td>Q5</td>
<td>In my Mathematics class, I understand even the most difficult work</td>
</tr>
<tr>
<td>Q10</td>
<td>I often worry that it will be difficult for me in Mathematics classes</td>
</tr>
<tr>
<td>Q14</td>
<td>I worry that I will get poor marks in Mathematics</td>
</tr>
<tr>
<td>Q7</td>
<td>I look forward to my Mathematics lessons</td>
</tr>
</tbody>
</table>

Question 4 had the most consistently negative responses and asked the students to respond to the following statement: *I have always believed that Mathematics is one of my*
best subjects. This question is positive in nature and had 54 student responses were disagree or strongly disagree representing a negative attitude towards math out of the 64 possible responses. Edward consistently believes that math is one of his best subjects in school and has the highest percentage of positive responses over time (Figure 2). Johnny and Susan both believed one time during the trial period that math was their best subject. The other five students consistently disagreed that math is one of their best subjects.

![Number of Student Responses](image)

**Figure 2.** Q4 I have always believed mathematics to be one of my best subjects, \((N=8)\).

The questions that had the most positive responses were Q13, Q12, Q2, Q9, Q1 and Q11 respectively (Table 4). Three of these questions related to how students felt when actually doing math problems. Two of these questions related to how students felt that they did academically in their math classes. One question was a simple negative statement about mathematics that if students disagree to, means that they feel positively in their abilities addressed in that question.
Table 4

Mathematics Snapshot Questions with Positive Responses

<table>
<thead>
<tr>
<th>Q</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q13</td>
<td>I feel helpless when doing a Mathematics problem</td>
</tr>
<tr>
<td>Q12</td>
<td>I get very nervous doing Mathematics problems</td>
</tr>
<tr>
<td>Q2</td>
<td>I get good marks in Mathematics</td>
</tr>
<tr>
<td>Q9</td>
<td>I am interested in the things I learn in Mathematics.</td>
</tr>
<tr>
<td>Q1</td>
<td>I am just not good at Mathematics</td>
</tr>
<tr>
<td>Q11</td>
<td>I get very tense when I have to do Mathematics homework</td>
</tr>
</tbody>
</table>

For Q13, students were feeling less helpless about doing math problems after taking a chapter test (Figure 3). In Q12, students became less nervous about doing math problems as the trial period progressed to the end (Figure 4).

![Figure 3](image-url)  

*Figure 3.* Q13 I feel helpless when doing a mathematics problem, \((N=8)\).
Figure 4. Q12 I get very nervous when doing a mathematics problem, (N=8).

Question 7 was the only question that had almost equivalent responses between positive and negative. Students responded positively 30 times and negatively 34 times out of the 64 possible responses (Figure 5). The responses were negative for two days and changed to more positive responses for three days and then became equally positive and negative responses for three days (Figure 5).

Figure 5. Q7 I look forward to my mathematics lesson, (N=8).
After comparing the entire class and their responses to the *Mathematics Snapshot*, I compared the individual students’ responses over the eight times that the data collection tool was used. On the graphs *strongly agree* or *strongly disagree* is represented with the number 1 or 4 to show either strongly positive or a strongly negative outlook; *agree* or *disagree* is represented with the number 3 or 2 to represent a positive or negative remark, depending on whether the question was positive or negative in context.

Over the eight times that the *Mathematics Snapshot* was used, Edward had the most responses that represented an extremely positive outlook, with either *strongly agree* or *strongly disagree*. On March 7th, the students had significantly negative responses compared to the responses on March 12th. Tony had increasingly positive remarks during the treatment period. Kara and Barbara had times throughout the treatment period where they had very negative feelings towards mathematics. Peter and Susan had consistent responses throughout the treatment, with neither strongly negative nor strongly positive responses. On March 12th all eight of the students had remarks that were negative and not strongly negative. With the exception of Johnny, the students had responses that were increasingly positive about their feelings of math. Johnny had very negative remarks on March 14th. The data shows that there was a significant change from March 7th to March 12th in the attitudes of the students. On March 8th, I had a discussion with the students about their responses.

Individual analysis of the *Mathematics Snapshot* over time shows Ben, Barbara, Johnny and Kara show a spike in their positive feelings towards mathematics on March 12th. Five of the eight students began the treatment with a lower positive outlook than where they were at the end of the treatment. Three of the eight students began the
treatment with a higher positive outlook than where they were at the end of the treatment. No trends were noticed between the different students in when they had positive or negative outlooks in mathematics.

Tony began at a total positive score of 34 points and ended at a score of 43 points, he had a range of 12 points. Susan began at a score of 37 and ended at 34, she had a range of 5 over the treatment period. Edward had the highest scores compared to the other students, his highest score was 49 points and his scores had a range of 9 points. Peter had scores with a range of 7, with a high score of 35 points on March 13\(^{\text{th}}\). Ben’s scores were the most consistent out of the group; his scores had a range of 3 with a high of 36 points. Barbara’s scores had a range of 6 points and began at a score of 30 and ended at a score of 32. Johnny had the largest range of scores out of the eight students, his scores varied by 18 points, with a high score of 35 points and a low score of 17 points. Kara also had a fairly large range of 13 points, with a beginning score of 28 and an end score of 36.

Student responses were compared to identify trends in positive or negative answers over the treatment period. Edward, Tony and Ben had the most positive responses on the Mathematics Snapshot. Combined results from the eight times that students took the snapshot showed that Edward had 71% of his responses that were positive in nature, Tony had 56% of his responses that were positive in nature, and Ben had 53% of his responses that were of a positive nature (Figure 6).

Students that had mostly negative responses were Susan, Kara, Barbara, Johnny and Peter. Susan had 62% of her responses being of a negative nature, Kara had 63% negative responses, Barbara and Johnny had 65% negative responses. Peter had the most
negative responses through the trial period of 75% negative responses and only 25% positive responses (Figure 6).

Figure 6. Individual student overall positive and negative response comparison, (N=8).
Results from the *Mathematics Snapshot* survey showed students in Math Lab were expected to have a negative outlook on mathematics (Figure 7). The figure below shows a combined total for the eight times that the *Mathematics Snapshot* was given. By looking at the total opinions for each question it is easy to see the overall trends that the students felt during the treatment period. It also served for a discussion piece with the students.

![Figure 7. Mathematics Snapshot overall feelings about mathematics, (N=8).](image)

During Course 2 math, students were assigned a total of 31 graded assignments for 3rd quarter. Students were graded for their homework assignments based on whether they completed the assignment on time or not. If an assignment was turned in on time, the students received 100% credit, if it was late they received 50% credit, or the assignment may not have been turned in during the 3rd quarter and students received 0% credit. Pre-treatment, students had nine assignments from chapter 6. During the
treatment, students had eight assignments from chapter 9 and seven assignments from chapter 10. Post-treatment, students had seven assignments from chapter 11.

Tony, Ben and Johnny consistently turned in all of their graded alignments during 3rd quarter (Figures 8, 9, 10 and 11). During the main period of study, chapters 9 and 10, Peter turned in all of his assignments as well (Figure 9 and 10). Kara had no missing assignments during chapters 9 and 11, but had 40% of her assignments missing from chapter 10 (Figures 9, 10 and 11). At most, Susan turned in 71% of her assignments for chapter 11, and her lowest amount of completed homework was 43% of the assignments for chapter 10 (Figures 10 and 11).

![Figure 8](image_url)

*Figure 8.* Pre-treatment percentage of completed and missing assignment comparison chapter 6 with nine assignments given, \((N=8)\).
Figure 9. During treatment percentage of completed and missing assignment comparison chapter 9 with eight assignments given, (N=8).

Figure 10. During treatment percentage of completed and missing assignment comparison chapter 10 with seven assignments given, (N=8).
Prior to the treatment period, these eight students had a combined total of 17% of their assignments missing from Course 2 math (Figure 8). During the treatment period these students had a combined total of 14% of their assignments missing for chapter 9 and 22% of their assignments missing for chapter 10 (Figure 9 and 10). After the treatment period these students were missing a combined total of 8% of their assignment for chapter 11 (Figure 11). During the treatment, the eight students had 36% of their total assignments missing for the two chapters (Figure 9 and 10). Before and after the treatment, students had a total of 25% of their assignments missing for those two chapters (Figure 8 and 11). These students had the least amount of missing assignments during chapter 11, which was after completing the treatments in Course 2 and Math Lab (Figure 11).

This data shows a relationship of the percentage of missing work to the chapter tests for these eight students. I found that with these eight students there is a relationship
between when a student has less missing assignments that they score a higher percentage on their chapter tests (Figure 12). Creating a graph of this data to show the relationship was used for classroom discussion about work ethic.

![Graph showing the relationship between percentage of missing assignments and test scores.](image)

**Figure 12.** 3rd Quarter comparison of missing assignments for eight students and four chapter test scores from Course 2 resulting in 32 data points.

**Effects on Student Success in Mathematics**

The *Daily Reflection Exit Slips* (Appendix D) was implemented during Course 2 math classes to measure changes in student success throughout the treatment period. District tests and chapter tests from Course 2 were analyzed to see if students improved on tests. Students in Math Lab also participated in an inventory of skills test during Math Lab. Informal interviews were also implemented.
During the treatment period all students in Course 2 math were required to complete a daily exit slip when walking out of the classroom. Results were only recorded for the eight students that were also in Math Lab. Over half of the students that participated in this study said that they fully understood the daily lessons for chapters 9 and 10 (Table 5). There was only one day where a student from Math Lab said that they did not understand the daily lesson at all.

Table 5
*Daily Exit Slips Record of Understanding the Daily Lesson*

<table>
<thead>
<tr>
<th></th>
<th>Feb-22</th>
<th>Feb-23</th>
<th>Feb-24</th>
<th>Feb-27</th>
<th>Feb-28</th>
<th>Mar-02</th>
<th>Mar-05</th>
<th>Mar-08</th>
</tr>
</thead>
<tbody>
<tr>
<td>I fully understand today's lesson</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>I mostly understand today's lesson</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I do not understand today's lesson</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
</tbody>
</table>

Students were also asked to answer two questions on their exit slip. *How would you use today’s lesson in your daily lives; and what questions are still unanswered after today’s lesson.* Students from Math Lab were able to make connections to some of the daily lives; one student said that she could relate the lesson to “see how big I can make pies and cakes.” Another student said they could use the daily lesson to “find the perimeter of a house or building.” Some students honestly asked questions when they said that they didn’t fully understand the lesson.
As part of the supplemental materials for math lab, students took an inventory of their basic skills abilities in September, February and May. This inventory test gave light to the mathematical strengths that these students possess. To decide whether students have acquired enough of the basic math skills to move out of Math Lab, students need to be at 40 points of the total of 50 questions on the inventory test. The total score on the inventory test was also used for calculating the students final grades for Math Lab (Figure 13).

Figure 13. 50 Question Math Lab inventory of basic skills administered three times, (N=8).

During the Course 2 math class, students were given four quizzes and four chapter tests during 3rd quarter. All students that I have for Course 2 math were allowed and encouraged to use handwritten notes on all quizzes and tests except for the midterm and final. Students in Math Lab are generally given extra notes to help clarify the information given during the Course 2 class. Students in Course 2 math classes are also encouraged to correct their quizzes and tests in order to earn half-points back on their
scores. Tony, Peter, Ben, Johnny and Edward all took advantage of earning points back on their quizzes and tests during 3rd quarter.

In looking at pre and post test scores for chapter 9 and 10, seven of the eight students showed growth on the test (Figures 14 and 15). All of the student scores, if based solely on correct answers, would have given them test scores below 60%. Peter had the only decrease in scores for chapter 9 (Figure 14), and Barbara had the only decrease for chapter 10 (Figure 15). Johnny had the highest post-test scores out of these eight students on both the chapter 9 and chapter 10 tests (Figures 14 and 15).

![Figure 14](image-url)

*Figure 14.* During treatment Chapter 9 pre and post-test scores with 17 total questions, *(N=8)*
Figure 15. During treatment Chapter 10 pre and post-test scores with 15 total questions, \(N=8\).

At the beginning of the treatment period, students were shown the following graph during math lab as a motivational tool to show their growth from the beginning of the school year (Figure 16). All students showed some improvement from the beginning of the school year in the Course 2 content area. As a class the students were very excited to see how they improved from the pretest at the beginning of the year. We discussed as a class that even the smallest increases were still an improvement in the right direction. Peter showed growth by one point, and I reminded him that it was still growth, and that he should be proud of his accomplishments. The midterm was a different test from the pretest and was not an accurate measure of growth in mathematical knowledge, but it did make for a good motivational tool.
In comparing the same pre and post-tests for the students in Math Lab, they all showed growth (Figure 17). The smallest growth from pre to post-test was Barbara and Tony who had a growth of 7 points. Tony had a final score of 24 and Barbara had a final score of 18. The highest growth was Johnny with a change of 18 points resulting in a score of 38 point out of 50. Susan had a growth of 14 points for a final score of 29. Edward had a growth of 13 points for a final score of 27 points. Peter doubled his pretest score and had a final score of 28 points. Ben had a final score of 28 points and had a growth of 12 points. Kara had a final score of 26 points with a growth of 14 points, which is more than double her original score. According to the district standard of proficiency being set at 75%, none of the students in Math Lab passed the final for Course 2.
The purpose of this study was to help students identify their unique strengths through an Appreciative Inquiry process, and to see if emphasizing their strengths would increase student success and motivation.

Overall, the results for the *I am a Mathematician* interview brought to light an insight into whether these students in Math Lab, that are expected to dislike mathematics, had ever enjoyed math, or whether they truly disliked the subject as was expected. One of the interview questions asked the students if math was ever their favorite subject, and if it was, to then elaborate on when it was. Ben stated that “No, math has never been my favorite subject”. Peter and Kara simply stated “No”. Johnny replied with “Yes, almost all the time”. Tony said “Yes because it is easy”. Susan’s answer was the most surprising to me. Susan I expected to say no, but she responded with “Yes, I think in 4th
grade. My teacher would show me different strategies and that helped me and she would go over everything”.

Students were also asked if there was an adult or teacher that had helped them to understand math better. Peter and Tony listed their parents as someone who was able to help them with mathematics. I would agree that their parents are very involved in their learning because I received many emails from these two’s parents on how to help them succeed in Course 2 math. Susan mentioned that her Grandpa was the person that was able to help her to understand her mathematics. Johnny and Ben both listed someone other than a family member as the person who would take the time and initiative to help them with their learning. Johnny and Ben are also the two students that I had the strongest connection with over the school year and felt that I had to be motherly towards them and encourage them to succeed.

The five students that completed the entire interview gave me an understanding of how they have approached math in their pasts and whether they had a support system at home when it comes to mathematics and learning. The three students that did not complete the interview process did not let me have the opportunity to understand where they came from when they first encountered math. These interview questions showed me whether the students were pre-determined to like or dislike math from their families. The students that had support systems at home were willing to tackle math problems and to have intellectual discussions in class about problems that arose. The students that did not have a strong support system at home were inclined to shy away from doing mathematics at all costs.
In participating in the *10 Strengths Activity* I found that these students have a wide variety of strengths and that they were also able to find a way to relate their innate strengths to an activity they can do at school or in their daily lives. The class enjoyed telling their stories so much that they were comfortable inviting another 7th grade teacher into the classroom to participate. I found for myself that I learned a lot about the students with them having the opportunity to go up to the front of the classroom and talk for three to five minutes about something they were incredibly proud of; it brought out their personalities in a way that I did not get to see in the regular classroom activities. I also participated and shared a story with my students as the example, and throughout the remainder of the school year, the students were able to relate things that I did in class to the strengths I showed from the story that I shared with them. I in turn was also able to see some of their strengths on a daily basis, or remind students when they weren’t working to their full potential that they discovered from the *10 Strengths Activity*.

Knowing what innate strengths each student possessed opened the door for having conversations with students about what strength they were using when working through a particularly tough problem. It also brought to light opportunities for students to find one moment in their day where they excelled and went beyond being just another ordinary kid. After finding these strengths that each student possessed, research could begin on motivating students to learn and to use positive self-talk to work through problems. I also found myself wanting to do the *10 Strengths Activity* with the other students in my classes so that I could have the same rapport with those students.

After working through the *10 Strengths Activity*, the students were more comfortable with who they are as an individual, what they bring to the classroom, and
how they can interact with each other in a positive and beneficial manner that encouraged all students to learn. Students worked to create an inviting classroom atmosphere where all students were able and were encouraged to learn. Interactions with me as their teacher became easier, and I was able to interact with them better as well. Kara and Barbara were particularly quiet students, and occasionally I was able to ask them something about their story they shared and have a conversation with them. If I had not heard their story, I would not have been able to have those conversations that helped to make the students feel more comfortable in the classroom.

I was most excited to see the results of the Mathematic Snapshot at the end of the treatment. I believed that I had good rapport with the students, and that they enjoyed being in my classroom. I was trying to make the lessons fun and inviting for all the students in Course 2 and not just for the Math Lab kids. When I saw the overall responses to the snapshot, I felt very let down because in looking at the graph, there were many negative responses. Even when I showed the graph to the students in Math Lab they commented on how negative the responses were. Yet, some of the questions that appeared they would have had the negative responses, ended up to have had the most positive responses.

On March 8th, I showed the preliminary data to the students in Math Lab and what the attitude was with the students. There was a great discussion about why the students were feeling so negative towards math. I spoke with the students that had switched into my classroom from the other Course 2 teacher’s class about whether they were doing better in class or not. They all agreed that they were doing better than they had in the other class because they were actually doing their assignments and they comprehended
the lessons better than they had previously. I then asked the students why they still had such a negative attitude towards math when they were doing better. I can speculate that the students had the weekend to think about their responses and that is why they had higher responses towards the Mathematics Snapshot on March 12th. There is no other reason that I could see why they spiked on March 12th.

In reflecting on the Mathematics Snapshot I would want to either change the way that the questions were asked, or change the categories for students to choose for their answers. I did spend some Math Lab class time discussing the data that was collected and asked the students why they didn’t feel nervous or frustrated when doing math problems as Q13 and Q12 stated. There were a few comments made by the students that suggested that they may not have fully understood what the questions were truly asking or what it meant when they responded with the response they chose. I would also like to track the individual feelings about mathematics for a longer period of time. I plan to use a revised snapshot next year if I am teaching Math Lab again to see if there are any correlations with their grades at the end of the school year.

The responses of Q13 and Q12 had an opposite response of what was expected from students that struggle in math. I believed that students in Math Lab would feel very helpless and nervous when doing their math assignments because they did everything they could during Math Lab and in Course 2 classes to get out of doing their work. I believed that it was a stalling tactic because they felt uncomfortable when doing the math problems and were uncomfortable asking questions and admitting that they did not know how to solve the problems. With the responses I received, I now know that these eight students feel very comfortable doing their math or they didn’t feel very concerned about
doing their math and chose not to do the assignment in the first place. Ben, Johnny and Edward became increasingly comfortable asking questions as the study progressed showing that the positive nature of the classroom motivates student to learn by asking questions.

Question 7 asked students if they were enjoying their mathematics lessons. I had hoped that with five students transferred into my Course 2 class from another teacher’s class, and with the strength-building activities that were done in Math Lab, that students would become increasingly interested in their Course 2 math lessons. I had hoped it would have increasingly positive responses over time as I built stronger rapport with the students that I had in my classes twice a day. The responses started very negatively at the beginning of the treatment period when five of the students were still in the other teacher’s Course 2 class, and I had just returned from maternity leave.

The remarks that surprised me the most were those of Johnny. Johnny had the highest grades in Course 2 math throughout the school year. At the end of the school year he had an A in Course 2 math, and I later found out that he had passed the state test (MSP) and should not have been placed in Math Lab. There were a couple of times that I pulled him aside to talk to him about his negative attitude towards mathematics, especially when he was very good at it. I found out that there were a lot of issues at home, and that it reflected in his attitude towards the schooling, it had very little to do with the things that I could control as a teacher.

The Daily Reflection Exit Slips that I used were very insightful and helpful. The students in Course 2 math classes liked the exit slips and asked about why I had stopped
using them. They liked the idea that they were part of an accountability piece as to whether they were participating in the lesson or not. I would like to continue using the exit slips, but found that it was logistically difficult to do for 90 students a day. I would also like to add to the exit slips a possible summary of the daily lesson, or having the students write an example of what they learned for the day.

One example off of the exit slips was when Johnny asked “how will I use this if I am a gamer?” I responded to him saying that “As a gamer you may need to learn strategy and logistics. Knowing how to find the perimeter and circumference will help you to think logically.” Barbara asked about the area of a triangle, “Why do I have to divide by two?” To which I responded, “We have to divide by 2 because a triangle is ½ of a parallelogram.”

I believe that students in 7th grade should be given second and sometimes third chances to redeem themselves if they have made a poor choice in hopes that it will not be recipricated in the future. Part of the way that belief appears in my classroom is that the students are allowed and encouraged to correct all of their tests and quizzes to receive half of the points back that they missed on the tests. Out of the eight students from Math Lab that participated Tony, Peter, Ben, Johnny and Edward took the time to correct their tests and quizzes to earn points back. The other three students in my Math Lab class did not take the initiative to correct any of their exam scores, which shows that they were not motivated to have the best scores possible for Course 2 math. Interestingly, it was the boys that all took the time to correct their tests and get points back, where the girls did not.
I spoke with the Math Lab students about the correlation seen between the number of missing assignments that a student has and how well they score on assessments. I took their missing assignment and test scores for chapters 6, 9, 10, and 11 to see if it would generate something similar to what was discussed in many departmental math meetings. The data that was generated showed a relationship of the percentage of missing work to the chapter tests for these eight students.

In showing this information to my students, they were all looking at the graph in awe. Johnny and Ben both said that they were having an epiphany moment looking at the graph that compared percentage of missing assignments to test and quiz scores. Johnny said that “It just hit me, it explains so much about what is going on, and it makes sense”. Ben shook his head and said that “You’ve just blown my mind”. The rest of the group was not as vocal as these two were about the graph, but they were having quiet conversations and pointing to the graph.

In discussing the overall results from my data collection tools with my students in Math Lab, we discussed that there have been many studies in the past about positive thinking and that knowing what innate strengths we have that we can excel and become the person we were born to be. I spoke with Peter, Johnny and Barbara first about these results. I asked this small group of students that had been in my class since 1st semester why they had the most negative responses out of the group. Peter responded that, “Well, I just really don’t like math.” To which I asked him how he was doing in Course 2 classes, knowing full well that his grade was better than 70%. “I’m doing good in Course 2, I just don’t like numbers”. Johnny said, “I love math, but complex things make my
mind shut-down.” Barbara just shrugged her shoulders and was unwilling to respond to the prompts.

When asking these three students why their 4th quarter grades are going down in comparison to when I was doing my project. Peter said that he tried harder during the project because he didn’t want to disappoint me, “because of my grades, I do work because I don’t want to disappoint my parents.” Johnny said, “things at home are impacting my grades, I need to talk to my parents at home about how it’s affecting me.” Barbara was very quiet throughout the conversation. She finally opened up and told me that “it has nothing to do with the classroom. It’s family.” Peter ended our discussion by talking about the Mathematics Snapshot, “I was being truthful, I’m not good at math. I didn’t want to lie.”

I then spoke with Ben, Tony, Edward, Kara and Susan about their thoughts. They were the more positive students throughout the trial period and were not in my Course 2 class during 1st semester. When asked about why the students did more work during 3rd quarter, I specifically pointed out that Tony and Ben had no missing work during the trial period and had a lot of missing work with their previous teacher. Tony said, “I did it because I had to. I cared because of your project and because my parents care.” Ben piped up stating, “I payed attention, I started caring more. You are less scary.” Edward had the opposite response to the switch, he was doing worse in class. “I got lazy because I had good grades. People are always talking around me.” Kara also shared the same reasons that Edward did. Susan admitted that “I just don’t like to do it. I’m overwhelmed by all my missing work. I’m too social in class.” I asked Susan to elaborate on the overwhelmed feeling. I told her that you eat an elephant one bite at a
time, and that she could work on her missing assignments that way too. “I hate it! I’m about to do my homework, then I put it off until the evening, then I’m too tired and I promise myself that I will do it in the morning. Then I regret it. I hate that!” I asked her how she could solve her problem, “I could just do it.” I then showed this group their progress reports comparing 3rd and 4th quarters. “I’m terrible at math! It’s never been a strong point,” Ben shouted as soon as he saw his papers. Edward looked at his papers and said, “I like math, even though I’m horrible at it.”

After using all the data collection tools I found that no matter what I did in the classroom to encourage the students, that they still had to go home to their families, and if their families were not supportive that they would come back into the classroom the next day feeling more discouraged. I found that having a strong rapport with students is a key piece to having students that are willing to take risks in the classroom or that are willing to be in an uncomfortable place working with concepts that they do not understand.

Concluding Statements

In conclusion, the purpose of this study was to help students identify their unique strengths through an Appreciative Inquiry process, and to see if emphasizing their strengths would increase student success and motivation. These eight students were more motivated for brief periods of time and during those brief periods of time they were more successful. These activities that the students participated in required a catalyst and frequent activities afterwards that continued the success and to fuel further learning and strengthening of the students innate abilities.

In answering the research questions:
1. Will students be more successful on mathematics tests if their unique strengths are emphasized in class?

   Yes, students are more successful on math tests when their strengths are continually emphasized, utilized and encouraged.

2. Does a positive atmosphere and constant encouragement in a classroom increase student motivation in mathematics class?

   No, with the outside factors that contribute to a student’s entire being, just the positive and encouraging atmosphere of the classroom is not enough to encourage students to be motivated in mathematics class; especially if students are expected to complete their assignments at home where they have little or no support.

VALUE

In doing this research project I did not get the glowing results that I had anticipated. I believed that I had a greater impact on my students than I actually had. Even though I managed to have a very good relationship with these eight students, I was only able to help and encourage them to a certain point.

The Appreciative Inquiry process is a valid way to help people to see what they are good at and to build on those areas. Using Appreciative Inquiry in a classroom is difficult to do. The model that I used in this experiment was not a traditional model of Appreciative Inquiry. I found that it was difficult to use Appreciative Inquiry in a classroom where not all of the students were equally invested in their learning or in the goals that were set. The students would need to take an invested roll in the planning and
sustaining of the Appreciative Inquiry process in the classroom in order to make it successful on a longer scale.

Having a teacher that focused on the positive and the good in the students was very beneficial to the seventh graders. Anytime that I had a substitute teacher in the classroom all the students said was that the teacher just yelled at them and wasn’t very nice, that they really didn’t care about the students. I also heard students say that they wanted to transfer into my classroom because I cared and I was empathetic towards their needs as a learner. When I focused on the good that students did instead of the negative, it made it easier to get students to be on task and to make better choices with their free time. I was able to remind students that they weren’t working to their strengths, and that comment motivated the students to refocus on their assignments or classroom discussions.

This research project inspired me to continue teaching with an overly positive attitude. I have planned to use what I learned about motivation and independent strengths to motivate the staff at Fairview Junior High to learn about their innate abilities and what we can each do to make Fairview an inviting place where learning is abundant. I learned that using the *Daily Reflection Exit Slips* was a big hit with the students and will use them again in my future Course 2 classes.

**The Next Steps**

I would like to further study the effects of a positive atmosphere in a classroom with the student motivation to do their assignments and whether it translates to better scores on test, particularly the state mandated tests. I will be using the *Mathematics*
Snapshot as a tool in Math Lab in the following years. I have also begun working on my National Board Certification to further learning about myself as an educator.

In motivating others to research this topic, I would like to find a way to better implement the aspects of positive psychology into the junior high and middle school classrooms. Students in their adolescent years are vulnerable to the social aspects of humanity, if students can be encouraged early on to care about their educations and are motivated to become lifelong learners, there could be a significant shift in the nation and the beliefs of education and the way that the education system is run in America.
REFERENCES CITED


APPENDICES
APPENDIX A

I AM A MATHEMATICIAN INTERVIEW
I am a Mathematician Interview

1. What are some of the early math accomplishments that you remember from when you were little?
   a. When and how did you learn to count?
   b. How old were you when you could first count to one hundred?
   c. Who taught you?
   d. How did they teach you?
   e. Did you have the opportunity to ‘show off’ this new talent to others?
2. When you were in early elementary school (1st-3rd grade), what was your teacher’s name?
   a. How did your teacher feel about math?
3. When you were in early elementary school (1st-3rd grade) what did you like about math?
   a. When you were in early elementary school (1st-3rd grade) what did you dislike about math?
4. What do you remember about learning to add and to subtract?
   a. Which did you think was more fun?
   b. Why did you like that one better?
5. Did you have any ‘tricks’ you used to remember adding or subtracting?
6. Has math ever been your favorite subject?
   a. If yes, when was it?
      i. What about math made it your favorite?
   b. If no, what about math do you dislike?
7. Sometimes a teacher, adult, or an older student can help you like or understand math better. Have you ever had another person help you with math?
   a. If yes, who was it?
      i. What did they do to help you like/understand math?
   b. If no, tell about how that would have made a difference for you.
8. Sometimes people can recognize a time when their opinion of math dramatically changed either for the better or the worse. If such a time happened for you, explain to me when that was.
   a. What do you think caused this change in your opinion of math?
9. What year in school has math been the best for you?
   a. What made that year a good year in terms of math?
10. What year in school has math been the worst for you?
    a. What made that year a bad year in terms of math?
APPENDIX B

MATHEMATICS SNAPSHOT
### Mathematics Snapshot

Thinking about studying Mathematics: to what extent do you agree with the following statements?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am just not good at Mathematics</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>I get good marks in Mathematics</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>I learn Mathematics quickly</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>I have always believed that Mathematics is one of my best subjects</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>In my Mathematics class, I understand even the most difficult work</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
</tbody>
</table>

Thinking about your views on Mathematics: to what extent do you agree with the following statements?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>I enjoy reading about Mathematics</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>I look forward to my Mathematics lessons</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>I do Mathematics because I enjoy it</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>I am interested in the things I learn in Mathematics.</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>I often worry that it will be difficult for me in Mathematics classes</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>I get very tense when I have to do Mathematics homework</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>I get very nervous doing Mathematics problems</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>I feel helpless when doing a Mathematics problem</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>I worry that I will get poor marks in Mathematics</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
</tbody>
</table>
APPENDIX C

STUDENT STRENGTHS ACTIVITY
Student Strengths Activity

Directions:

Think about something that happened in your past that YOU made happen and that YOU were proud of. Draw a picture of this event. Be sure to use as much detail as you can. (You may turn the paper sideways).
APPENDIX D

MY 10 STRENGTHS
My 10 Strengths

Directions: Pick 10 words from the list that was generated by your classmates. Write a personal definition for each word. Describe a way you could use that strength at Fairview Junior High.

<table>
<thead>
<tr>
<th>My Strengths</th>
<th>What this means to me</th>
<th>How I can use it at Fairview</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<td>5.</td>
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<td>6.</td>
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<td>7.</td>
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<td>8.</td>
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<td>9.</td>
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<tr>
<td>10.</td>
<td></td>
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</tbody>
</table>
APPENDIX E

DAILY JOURNAL SELF REFLECTIONS
**Daily Journal Self Reflections**

1. Did you meet today’s goal?
   (Look at your ‘I Will Be Able To’…)

2. How would you use what you learned today in your life?

3. What questions are still unanswered at the end of this lesson?
APPENDIX F

STUDENT STRENGTHS ACTIVITY STUDENTS PICTURES
Edward’s *Student Strength Activity* picture.
Johnny’s Student Strength Activity picture.
Kara’s Student Strength Activity picture.
I was proud when I was 7 and parked my mom's car in the parking lot.
Tony’s Student Strength Activity picture.