HOW IMPLEMENTING A DAILY PARTICIPATION GRADE IN 5th GRADE SCIENCE AFFECTS STUDENT LEARNING

by

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A professional paper submitted in partial fulfillment of the requirements for the degree of Master of Science in Science Education

MONTANA STATE UNIVERSITY
Bozeman, Montana

July 2012
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Tylene Marie Walters

July 2012
# TABLE OF CONTENTS

INTRODUCTION AND BACKGROUND .................................................................1

CONCEPTUAL FRAMEWORK ...........................................................................3

METHODOLOGY ..............................................................................................11

DATA AND ANALYSIS ....................................................................................18

INTERPRETATION AND CONCLUSION .........................................................35

VALUE .............................................................................................................39

REFERENCES CITED .......................................................................................41

APPENDICES ..................................................................................................42

  APPENDIX A: Initial Student Interview Questions .......................................43
  APPENDIX B: Student Pre Survey .................................................................46
  APPENDIX C: Student Participation Rubric ..................................................49
  APPENDIX D: Teacher Participation Rubric ..................................................51
  APPENDIX E: Streamlined Teacher Participation Rubric ..............................53
  APPENDIX F: IRB Exemption .......................................................................55
  APPENDIX G: Student Post Survey Questions ............................................57
  APPENDIX H: Student Post Interview Questions ........................................60
LIST OF TABLES

1. Treatment and Instrumentation Schedule .................................................................12
2. Treatment Plan ........................................................................................................15
3. Research Data Collection Matrix ...........................................................................16
LIST OF FIGURES

1. Academic Groups based on Overall Class Grades ......................................................19
2. Treatment vs. Non-Treatment Test Scores .................................................................21
3. Treatment vs. Non-Treatment Test Scores with Academic Groups .......................22
4. Pre vs. Post Survey Results ......................................................................................25
ABSTRACT

How can student daily participation be increased? Student participation was lacking in fifth grade science. The teacher implemented the use of daily participation rubrics for each lesson, which was completed by both the student and the teacher through various non-treatment and treatment cycles. Non-treatment means a cycle without implementation of the student rubric during the science lessons. The teacher also implemented surveys and interviews for the students to obtain information about their opinions and attitudes regarding the daily participation rubrics. These were done at the beginning and end of the action research project. The results from this action research show that from the first non-treatment cycle to the last treatment cycle, student participation improved.
INTRODUCTION AND BACKGROUND

Project Background

Introduction

Over this past year, I noticed during the regular classroom lesson from the book, student behavior suggested disinterest with their lack of participation in both class reading and discussion. Students were not tracking as we read sections aloud and appeared to lose interest quickly. However, during a project that included a daily participation grade, I saw some surprising behavior. Every day, students had to show me their progress on their projects, and would receive points for how much progress they had made. As if a switch had been flipped in my classroom, many of them were suddenly interested in the number of points they received each day. It was this turnaround in behavior that fueled my fire for my action research. The school I teach at is unique and interesting, and a description is merited prior to giving my research questions.

School and Class Description

I teach in a small rural school in Amsterdam, Montana. Our school is certified K-8th grades however, we only have grades K-6th and send our 7th and 8th graders to a neighboring middle school, since we don’t have the space or means. We do not have full time kindergarten. From our spring attendance count at our school to the enrollment in the fall, our school gained 20 new students. Our current attendance is at 150 students. We do not have a formal cafeteria, and we do not have any kind of a gym. We do not have our own hot lunch program so we have our food driven in from a neighboring school about eight miles away. This year, our school had the largest class in its history,
26 students in 3rd grade. Amsterdam School is in a Dutch settlement and predominantly white with a small percentage of Hispanic students.

I taught all subject areas to 21 5th grade students. I received a new student halfway through my action research, so I only had data representing his time here. I also had a student that does not read at a fifth grade level; however, she had gained confidence and volunteered regularly. I made sure I choose her when the paragraphs were short and the vocabulary is simple. Based upon her ability coming into the school year, this portion of the participation grade was never counted against her.

I had 7 boys and 14 girls. When this class was in 4th grade, there were only 17 students, so this class had gained four new students this year. From the original 17, 3 boys received Title I last year. I did not have any students that have IEPs (Individual Education Plans), but I did have three students that received Title I support, and these were two girls and a boy. Out of the 21 students in my class this year, there were twin girls that were homeschooled previously and had never been in public school before. These two students were in Title I. About 43% of the class received free or reduced lunch. The class was all Caucasian. Another interesting dynamic is that I had two sets of twins and both sets are girls.

Research Questions

My primary question and sub questions are:

*What is the impact of assigning a daily participation grade to students in fifth grade science?

*What will the impact be on student’s attitudes when given daily
participation grades?

*What will the impact on students be with using self-assessed participation rubrics?

*What is the correlation between using the daily participation rubrics and chapter test scores during treatment and non-treatment cycles?

*What will be the impact on the teacher when using rubrics and taking daily participation grades?

My support team consisted of my administrator, Scott McDowell, two other teachers on staff, Kim Devore, Tamara Engellant, and my science reader Robyn Klein. Scott McDowell was selected because he is my administrator, is knowledgeable of the requirements for Action Research and a practicing teacher as well. Kim Devore is also working on her MSSE degree so she is knowledgeable about our project and will give me honest feedback, constructive criticism, and moral support. Tamara Engellant is the Title I teacher and a great proof reader. My science reader is Robyn Klein, one of my former professors at Montana State University. Robyn Klein has been a science reader before for Masters of Science in Science Education (MSSE) capstone projects, so she is knowledgeable and familiar with the procedures and expectations.

CONCEPTUAL FRAMEWORK

Motivation, engagement, and daily participation in class activities such as discussions, readings, and completed assignments, are an ongoing struggle in most classrooms. The struggle for the educator comes with each student’s differing level of ability and interests. Many things impact a student’s motivation and attitudes, for
example, intrinsic motivation, extrinsic motivation, student confidence, practical applications of material, how the material is presented, parent attitudes, and everyday feedback. When researching daily participation, there were not many articles to be found. It seems that daily participation has not been extensively studied. Perhaps this is because there is no interest in the area or that the ideas are quite new. Motivation, engagement, and participation are all closely related. If students are motivated, then engagement and participation are likely to follow. There are also many different tools that can be used to measure attitudes, motivation, and participation. Some tools such as surveys and interviews are used frequently, while others, like rubrics, are not.

**Direction**

Eyck and Pickens (2009) investigated student and teacher perspectives regarding motivation in two different science courses. They investigated two different classes and subject areas of science. With many types of data collection tools to choose from, finding the ones that will give you the data you need to answer your questions about motivation, engagement, and participation can be difficult. Eyck and Pickens decided to use various data collection tools, like observations, interviews, and a Likert-type survey on student and teacher views about motivation in science to obtain their data. These methods of data collection were also used in my action research.

Unfortunately, Eyck and Pickens (2009) did not list any specific ideas about how to improve student motivation, attitudes and participation with the use of a daily participation grade, but they did list several other possible strategies. These strategies included: incorporating enthusiasm into presentations, promoting a nonthreatening class environment, encouraging dialogue, using practical applications, and building self-
confidence. Some of the strategies listed are naturally incorporated into my classroom instruction. The other strategies should not be passed over because with increased dialogue and practical applications, you can involve and reach more students, inevitability increasing their motivation and hopefully, participation as well. By implementing the rubric, I am trying to increase motivation and participation. Patrick and Yoon (2004), and Pinrich and Schunk (2002) all agree that research shows increased motivation leads to improvement in cognitive and behavioral engagement, ultimately resulting in conceptual understanding (as cited in Eyck & Pickens, 2009).

The following quote displays what I see in my fifth grade classroom related to motivation.

The apparent absence of motivation to learn is not confined to students who quit school because many who remain in school have apathy and are content with just getting by, meaning doing the minimum amount of work possible to advance to the next grade level (Lumsden, 1995, pp.1-2).

Lumsden (1995) discusses that somewhere between the toddler preschool stage and the in school age, as early as third or fourth grade, children seem to lose their motivation to learn. Many reasons for this are mentioned like developmental changes in the child, self-perception, and self-worth. Meaning that when they are young they do not realize their abilities or how they compare to their peers, however, as they get older and their self-perception changes so does their motivation to learn because they realize the labels that are put on students. For example, good students get A’s, so if you don’t get A’s you’re not a good student. So even though you’ve made progress and worked hard,
but didn’t get an A, you’re a poor student, so why bother trying if you’re not recognized for the gains you did make.

There are a multitude of factors that students bring into the classroom that affect their attitudes and behaviors when it comes to learning. I have seen this first hand with my students. For example, if the parent does not place any importance on learning, grades, or the responsibility of turning their work in on time, the student adapts the same attitude of indifference or apathy. The ability and willingness to learn are affected by whether you are operating from extrinsic or an intrinsic motivational orientation (Lumsden, 1995). An example of extrinsic motivation I have seen in my class is of students thinking they need to be rewarded or given a prize for doing things they should be doing as part of their job as a student. I also have students who are intrinsically motivated, meaning they do what they need to do because of personal fulfillment or joy. An example of intrinsic motivation I have seen in my classroom is a student helping another classmate when there is nothing for them to gain from it except the personal satisfaction of helping someone. Most education is not necessarily built for those students who are extrinsically motivated unless their extrinsic motivation is to receive a good grade. I have also seen, on a daily basis, how motivation and student attitudes, negative or positive, affect student learning. For example, I have a male student who has a poor attitude about school, is not motivated, and cannot see its importance, which is also reflected by the parents’ attitudes. When he does his work, he does not do it completely, follow directions, or care about the grade he earned because when asked to correct his answers for a half point back to boost his grade, he responds with a phrase like, “Do I have to?”
From the data I had collected through surveys, interviews, rubrics and observations, I was hoping to see that my action research treatment of implementing daily participation rubrics had motivated both extrinsic and intrinsic learners. My extrinsic learners know they get immediate feedback and have some control over their daily grades, and my intrinsic learners are motivated by having self-pride in knowing that they did well and met all the requirements asked of them on the rubric.

**Theoretical**

The idea of doing everyday assessments such as participation rubrics, is not well published, meaning at the time of my literature review in my action research, I found one article which was about using everyday assessments in an art classroom. I believe taking a daily participation grade is a very valuable tool for students in order for them to feel they have ownership in their grade. In my action research treatment cycles, I had each student fill out daily participation rubrics grading themselves for each lesson, and I filled one out for each student as well. These rubrics contained open-ended questions for students to comment on their reasoning as to why they scored themselves a certain way. Stokrocki (2005) thinks everyday assessment of classroom learning is crucial because it gives feedback to the student immediately in the process of their learning, more than measurement or rubric taking does. It was not stated in this article as to whether or not students were doing a self-assessment rubric, and the rubric was not a participation rubric like mine. This article was mainly about everyday assessment in the art classroom, but some of the main underlying ideas and principles were applied to my project. This article also states that students need the opportunities to pre-assess and post-assess their own
learning, problem solve, reflect collaboratively and evaluate their own work (Stokrocki, 2005). One method I used was student evaluations on their own participation using a rubric to guide them through the evaluation process.

**Data Collection and Analysis**

There are many methods one can use to measure or get data for attitude, motivation, and participation. I used interviews, chapter assessments, surveys, student rubrics, teacher rubrics, and observations, which gave me both qualitative and quantitative data. By using these different techniques, I will be encompassing The Three E’s (experiencing, enquiring, examining) of Action Research Data Collection for Qualitative Data (Mills, 2011). With the data I collected from these different tools, I will be able to triangulate my data, meaning that various sources can be used to measure the same questions. Once data is collected, it is then compared to enhance the validity and credibility of a research study (Hendricks, 2009).

I used a Likert-type survey twice in my action research, once at the beginning of my project and once at the end. Likert-type surveys provide data for questions about attitudes, daily participation grades, and engagement by participation (Mills, 2011). I also included open-ended questions. This gave me both the quantitative and qualitative data I needed. The Likert-type survey was the best for what I needed because it was short and simple for the age level of my students. By doing this type of survey, I was able to get more information thorough answers and comments on the open-ended questions. Mills (2011) suggests avoiding lengthy surveys and/or questionnaires because it can take too long for students to complete the task; and no matter how much they want to help, if
it is too long, chances are you might not get it back. Hendricks (2009) refers to this as inquiry data. This type of data can provide the action researcher with participants’ perceptions about the effectiveness of an intervention, ways the intervention could be improved, and opinions regarding positive and negative features about the intervention. The survey made it a more collaborative effort between the students and myself, and it provided great insight on my action research project. Hendricks (2009) also recommends this as a good alternative to the structured interview, especially if you have time limitations. Anonymous surveys may make the participants feel more comfortable, providing honest answers, but cautions to use it for the right audience. I chose not to use anonymous surveys because I wanted to be able to monitor the responses from specific groups like boys versus girls and high academic achievers versus low academic achievers to see who benefited from my treatment the most.

Another type of data collection I used was student interviews. I did a pre-treatment interview and a post treatment interview. Mills (2011) mentions the importance of paying attention to your audience in regards to wait time, using convergent and divergent questions that are understandable to them. Ideally, I wanted to choose two students, one boy and one girl, from each academic level A, B, C, D. However, I didn’t have students in each of those academic areas at the beginning of my action research project. I interviewed a girl and boy from the A and B area then one boy from the C area. During the post interviews, at the end of my treatment, I had students in each academic area. I thought this would give me a better look at the big picture. Since I used different methods to measure the same questions, at the end of my analysis I was able to see consistency in their answers and major underlying themes became apparent. Hendricks
(2009) suggests that this can provide baseline data, which can later be used to compare student’s attitudes about science after the intervention. Since the interviews were one of my first forms of data collection, they were used to establish my baseline. As my analysis concluded, I could see that their motivation and attitude towards rubrics and a daily participation grade had improved on average as a whole class. “Being actively involved is essential for meaningful learning, and as students’ understanding develops, their perceptions of competence and autonomy both increase,” (Eggen & Kauchak, 2007, p.355). This supports the rubrics by demonstrating increased student participation. Gottler (2010) explains in a study conducted to monitor the participation of 24 5th graders in a mathematics class, it was mentioned that lack of participation may not always be connected to a lack of understanding of the material being taught, but that it has to do with how the subject views their personal identity in the classroom (as cited in Ewing, 2007). This is another good point to consider because students’ self-perception starts to change greatly when they become involved with school and as they start to advance in grade levels. For example, third and fourth graders are much more aware of their place in the classroom and compare themselves to their peers more regularly than kindergarteners or first graders. From the data I had collected through surveys, interviews, rubrics and observations, I could see that my action research treatment of implementing daily participation rubrics had motivated both extrinsic and intrinsic learners.
METHODOLOGY

Treatment

I teach 5th grade, all subject areas, and have 21 students. I implemented daily participation grades through the use of rubrics for my fifth grade science class. Prior to treatment cycles, I administered a student survey to all students in the class and interviewed five students, two girls and three boys. I also showed the students a Prezi presentation about participation and discussed what participation meant and looked like. I also walked students through a discussion about what a rubric was, why we were using it, and how to fill it out. When I discussed the rubric, the students had a copy of one in their hands so they could visually see it and understand. I taught alternating cycles, or chapters, with and without the daily participation rubric grades. Non-treatment refers to a cycle without daily participation rubric grades. A treatment cycle included a daily participation rubric grade for that cycle. The alternating cycles continued for six chapters from mid-September to mid-December, about three months.

Table 1 displays my treatment and instrumentation schedule. Since both of these are represented in this table, behind each activity description I have either put a T for treatment or I for instrumentation.
Table 1
*Treatment and Instrumentation Schedule*

<table>
<thead>
<tr>
<th>Activity</th>
<th>Non/Treatment</th>
<th>Topic</th>
<th>Tentative Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Begin Teacher Reflective Journal (I)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit A Chapter 1 Lessons 1-3</td>
<td>No Treatment</td>
<td>Cells and Body Systems</td>
<td>9/13/11 – 9/27/11</td>
</tr>
<tr>
<td>Administer Initial Survey (I)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conduct Initial Interview (I)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score student worksheets and chapter reviews (T)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score Chapter Assessment (T)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit A Chapter 2 Lessons 1-3</td>
<td>Treatment</td>
<td>Classification</td>
<td>9/29/11 – 10/14/11</td>
</tr>
<tr>
<td>Score student worksheets and chapter reviews (T)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students fill out self-participation rubrics for each lesson (I)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher fills out student participation rubrics for each lesson ½ the class (I)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score Chapter Assessment (T)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit A Chapter 3 Lesson 1-3</td>
<td>No Treatment</td>
<td>Animal Growth and Heredity</td>
<td>10/17/11 – 11/1/11</td>
</tr>
<tr>
<td>Score student worksheets and chapter reviews (T)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher fill out student participation rubric for each lesson on the class (I)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score Chapter Assessments (T)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit A Chapter 4 Lessons 1-3</td>
<td>Treatment</td>
<td>Plants and Their Adaptations</td>
<td>11/2/11 – 11/17/11</td>
</tr>
<tr>
<td>Score student worksheets and chapter reviews (T)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students fill out self-participation rubrics (I)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher fills out student participation rubrics (I)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score Chapter Assessment (T)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit C Chapter 1 Lessons 1-3</td>
<td>No Treatment</td>
<td>Changes to Earth’s Surface</td>
<td>11/21/11 – 12/6/11</td>
</tr>
<tr>
<td>Score student worksheets and chapter reviews (T)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher fill out student participation rubric for each lesson on the class (I)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score Chapter Assessments (T)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit C Chapter 2 Lessons 1-3</td>
<td>Treatment</td>
<td>Rock and Minerals</td>
<td>12/7/11 – 12/14/11</td>
</tr>
<tr>
<td>Score student worksheets and chapter reviews (T)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students fill out self-participation rubrics (I)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher fills out student participation rubrics (I)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score Chapter Assessment (T)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administer Post Survey (I)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conduct Post Interviews (I)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Review Teacher Reflective Journal (I)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
I started first with a non-treatment cycle in September. In non-treatment cycles, I instructed lessons and activities from that chapter. Throughout the non-treatment cycle, I used various methods to assess students such as worksheets provided by the curriculum, discussions, student responses, chapter reviews and chapter test from the curriculum. I made instructional adjustments as needed for students with special needs. At the beginning of my action research, I planned to use only teacher rubrics during treatment cycles; however, I decided to collect data through the teacher rubrics during non-treatment cycles too. Another change I made throughout my action research project was to take daily participation grades on the whole class every time. This did not start until I had gone through my first treatment cycle and streamlined my rubric. I had to be sure to mark the date at the top. I thought that this would give me great quantitative data to be able to compare non-treatment to treatment cycles to see how well my action research was really working. At the end of the non-treatment cycle, the whole class proceeded onto the next chapter, which will be a treatment cycle.

In a treatment cycle, I instructed lessons and activities from the chapter. Throughout the treatment cycle, I used various methods to assess students such as worksheets, chapter reviews, and chapter tests from the curriculum, self-assessment rubrics, and teacher rubrics which displayed daily participation grades (Appendix C and D). Before the lesson began during the treatment cycle, students were given a blank rubric as a reminder of the expectations for participation in class. After reading the science lesson aloud in class, students were given three to five minutes to fill out their daily participation rubrics. Students labeled the date at the top of their rubrics. Students had varying strategies to monitor their own participation. Some students started filling
them out during the lesson. Others made tally marks on their sheets to help them keep track of their participation. I asked the students to leave their score at the top blank so that the teacher could write it in for them. When completed, the students handed them into the science tray. During this time, I also filled out the teacher rubric. I marked on the rubric each time a student participated or volunteered to participate as to keep track of the students rubric score. I clearly marked at the top the date as to be able to match to the student rubrics from that day for comparison. The hardest part of the rubric for me was to accurately score whether or not the student was paying attention and listening to the reader. After the first treatment cycle, I realized I needed to relocate myself to the front of the room, so I could see all the students’ faces. This section of the teacher rubric was the weakest, due to the inability to watch all the students all the time. After I was done with my rubric, I gathered the students’ rubrics from the science tray and put them together. I made the same instructional adjustments, as in the non-treatment cycle, as needed for students with special needs. As with most classes, there were some students who did not always complete them, turn them in or the student may have been absent.

Table 2 visually demonstrates my treatment plan for both non-treatment and treatment cycles.
Table 2
Treatment Plan

<table>
<thead>
<tr>
<th>Non-Treatment Cycles</th>
<th>Treatment Cycles</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Introduce the objectives and main concepts to students</td>
<td>• Introduce the objectives and main concepts to the students</td>
</tr>
<tr>
<td>• Teach each lesson in the chapter – read aloud as class</td>
<td>• Teach each lesson in the chapter - read aloud as class</td>
</tr>
<tr>
<td>• Students complete a worksheet for each lesson covered and hand it</td>
<td>• Students complete a worksheet for each lesson covered and hand it in</td>
</tr>
<tr>
<td>• Students fill out study guide daily based on information from each lesson</td>
<td>• Students fill out study guide daily based on information from each lesson</td>
</tr>
<tr>
<td>• Students discuss and respond to verbal lesson questions</td>
<td>• Students discuss and respond to verbal questions</td>
</tr>
<tr>
<td>• Teacher fills out participation rubric daily for all students</td>
<td>• Students fill out a self-assessment participation rubric and hand it in</td>
</tr>
<tr>
<td>• Students complete the chapter review and hand it in</td>
<td>• Teacher fills out a participation rubric daily for all the students and puts it in a group with the student rubrics for that day</td>
</tr>
<tr>
<td>• Administer the Chapter Test</td>
<td>• Students complete the chapter review and hand it in</td>
</tr>
<tr>
<td></td>
<td>• Administer the Chapter Test</td>
</tr>
</tbody>
</table>

Research Design

Various methods of data collection were used for my action research project. I used interviews, surveys, rubrics, and a reflective journal that had not been implemented before in the classroom. I also used curriculum worksheets, chapter reviews, and chapter tests. These different data collection resources were excellent for triangulation of data and providing both quantitative and qualitative data. Reliability and validity were established for all my instruments by methods such as triangulation, using pre-established instruments like the Likert-type survey, and having colleagues and professors look over all my instruments.

Table 3 Research Data Collection Matrix below explains which instruments I
used to provide the data to answer my primary and four sub questions.

Table 3
Research Data Collection Methods

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>INITIAL &amp; FINAL SURVEY</th>
<th>INITIAL &amp; FINAL INTERVIEW</th>
<th>SELF-ASSESSMENT RUBRICS</th>
<th>TEACHER RUBRICS</th>
<th>CHAPTER ASSESSMENTS</th>
<th>TEACHER JOURNAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Q</td>
<td>I = XXX</td>
<td>I = XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td></td>
<td>F = XXX</td>
<td>F = XXX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-Q #1</td>
<td>I = XXX</td>
<td>I = XXX</td>
<td></td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td></td>
<td>F = XXX</td>
<td>F = XXX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-Q #2</td>
<td>F = XXX</td>
<td>F = XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Sub-Q #3</td>
<td>F = XXX</td>
<td>F = XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
</tr>
<tr>
<td>Sub-Q #4</td>
<td>I = XXX</td>
<td>I = XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td></td>
<td>F = XXX</td>
<td>F = XXX</td>
<td></td>
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*I = Initial      *F = Final

*Primary – What is the impact of assigning a daily participation grade to students in 5th grade science?  
*Q 1 – What will the impact be on student’s attitudes when given a daily participation grade?  
*Q 2 – What will the impact on students be with using self-assessed participation rubrics?  
*Q 3 – What is the correlation between using the daily participation rubrics and chapter test scores during treatment and non-treatment cycles?  
*Q 4 – What will be the impact on the teacher when using rubrics and taking daily participation grades?

Students did the initial survey and initial interview before the treatment cycles began (Appendix A and B). Data was collected from three non-treatment cycles and three treatment cycles. My first cycle was a non-treatment cycle (a chapter without the daily participation rubric grade). This first cycle included a Likert-type survey and student interviews to gather baseline data. The initial interviews and Likert-type surveys
were used to gather a baseline for student attitudes and perspectives about rubrics, science, and daily participation. The Likert-type surveys had open-ended questions on them to provide both quantitative and qualitative data. The frequency of responses and patterns from the surveys provided quantitative data, while the open-ended question part of the surveys provided qualitative data. The interviews provided qualitative data through their varying responses to the questions. Students were given another survey and interviewed after the last treatment cycle.

Students were given a daily self-participation rubric assessment sheet regarding their participation at the end of each treatment cycle science lesson (Appendix C). The student rubric, since it had points for responses, provided quantitative data; however, those same questions for points were also accompanied by open-ended questions and that data provided me with qualitative data.

At first I used a rubric just like the student rubric to assess their participation on a daily basis (Appendix C). However, unforeseen difficulties, such as it was using too many papers, I ended up modifying the information and layout of the student rubric when creating the first true teacher rubric to make it more user-friendly (Appendix D). Originally, I was only going to assess half the class every lesson. However, once I made the changes mentioned above I could assess the whole class daily. The students did not know which students I was assessing or if I was assessing the whole class. The teacher rubric was based on points and did not contain any open-ended questions or responses, so it provided quantitative data to be able to compare to the students’ rubric quantitative data. At the end of the treatment cycle, the whole class proceeded onto the next chapter.
which was a non-treatment cycle. At the end of the last treatment cycle, post surveys and post interviews were conducted.

As part of my action research project, I had to obtain approval from the Institutional Review Board. 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 (Appendix F). I’ve explained my treatment and non-treatment cycles, instruments and research design, and how I’ve established reliability and validity. Next, I will discuss the data and analysis results from the use of the above-mentioned instruments during treatment and non-treatment cycles.

DATA AND ANALYSIS

At first glance of my data, it appears that the implementation of my treatment was successful, which would answer my primary question, “What is the impact of assigning a daily participation grade to students in fifth grade science?” However, I needed to dig deeper to answer my sub questions: what is the impact on student attitudes when given a daily participation grade; what is the impact on students using self-participation rubrics; what is the correlation between the treatment and non-treatment science chapter test scores; and, what is the impact on the teacher. Besides these specific questions, I really wanted to know how successful the treatment was, and for whom it was the most beneficial: high academic achievers, middle academic achievers or low academic achievers. High academic achievers have an average overall class grade of 87% or higher, middle academic achievers average between 77-86%, and low academic achievers average 76% or lower. The data I collected from the various instruments I used during
the treatment and non-treatment has been valuable. I not only looked at my newly implemented instruments, but also instruments that I regularly use and student overall grades.

Figure 1 below represents the class percentages of boys and girls that fall into each academic achieving group. As you can see from the figure, there were no boys in the high academic group and no girls in the low academic group. This could be for a number of reasons such as it was the beginning of the year and the girls might have acclimated to school quicker than boys or that the girls are developmentally at a different stage when these overall academic grades were calculated.

<table>
<thead>
<tr>
<th>Academic Groups Based on Overall Grades</th>
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</thead>
<tbody>
<tr>
<td>Percentage of each group that is Boys or Girls</td>
</tr>
<tr>
<td>0%</td>
</tr>
<tr>
<td>33% of Class High Group 7 Students</td>
</tr>
<tr>
<td>High Academic Boys</td>
</tr>
</tbody>
</table>

Figure 1. Academic groups based on overall grades, (N=21).
This figure helps me realize that at this point it is my boys that are struggling the most, since all of them are in either the middle group or low group. This initially led me to believe that this action research project might help the boys in the middle to lower groups the most.

The first two questions I would like to try to tackle are the impact on students’ attitudes when given a daily participation grade, and the impact on students when using self-assessed participation rubrics. These two questions were harder to answer than the other questions because they were dealing with student attitudes and the impact on the student itself, which varies for each student. Sometimes with this age group, their attitudes can be inconsistent from day to day. I looked at many different instruments to answer these questions: treatment/non-treatment chapter test scores, pre and post surveys, and treatment/non-treatment rubric scores. Both of these questions have, to some extent, been answered together because the data overlaps. I will first discuss and analyze the chapter test scores, then the rubrics, and finally the surveys.

**Chapter Test Scores**

Figure 2 represents the difference between treatment test scores versus non-treatment test scores for the class average. Figure 2 shows that the treatment test scores yielded an overall higher class percentage on chapter tests.
Figure 2. Treatment vs. non-treatment test scores, \((N=21)\).

Regarding student attitudes with treatment/non-treatment test scores, the class average with the test scores during treatment was an 85% while non-treatment was 79%. The treatment might be a possible reason for the average increase of their tests scores since they improved in different areas such as the daily participation rubrics and surveys relating a positive attitude toward the treatment. However, there are other factors like the content unit that might be directly related to the increase as well. As for the rubric scores, during the treatment, I scored students at a 9.0 points on average and they scored themselves at 9.2 points; while during non-treatment, students were scored on average at 8.5 points. As mentioned above, if students had a negative attitude toward the rubrics or participation, then there wouldn’t be a positive difference in the scores between treatment and non-treatment scores.

Figure 3 takes the breakdown a step further and shows the treatment versus non-treatment test score comparison based on academic groups. By high academic group, I
mean students who have an overall class grade of 87% or higher, middle academic 
achievers are from 77% to 86%, and low academic achievers would be a score of 76% or 
lower.

![Treatment vs. Non-Treatment with Academic](image)

**Figure 3.** Treatment vs. non-Treatment with academic breakdown, (N=21).

As you can see from Figure 3, it appears that the middle academic group shows 
the most improvement out of all the groups. Just because a student started in the low 
academic group during non-treatment does not mean that student is in the low academic 
group during treatment. They could have moved up to the middle academic group. The 
most important finding is that all groups showed improvement due to the treatment in this 
study.
Self-Assessed Participation Rubrics

What was the impact on students using self-participation rubrics? The teacher and student rubrics asked questions regarding how much the students participated and what forms of participation they used. When looking at just the rubrics completed by the students and the teacher during treatment and non-treatment cycles, there were some discrepancies. Eight students fell outside the standard deviation for the self-assessment rubrics. Comparing their average grade in all subject areas, I found that all but one of them had an average grade of 81% or better in all subject areas. One student had an average grade of 69%, the lowest achieving boy. My research cannot conclude that good self-reflecting students are better academically and that weaker self-reflecting students are poorer academically. The average rubric scores during the treatment cycles for both the students and teacher were relatively close with a difference of 0.2 points. The students on average scored themselves higher than the teacher. This is understandable, considering that most of these students are between 10-11 years old and do not always have an accurate perception of their actions or always want to get the best score.

Out of my 21 students, 14 girls and 7 boys, 6 of the 7 boys scored themselves higher and 10 of the 14 girls scored themselves higher than the teacher on their rubrics. One boy scored himself exactly the same as I did and four girls scored themselves lower than what I did. The boy that scored himself exactly as I did is my highest achieving boy in overall grades with an 86% which puts him in the middle of the class academically. The amount of effort and motivation a student puts into their work correlates to higher scores. Out of the four girls that underscored themselves, three of them are in the top four for overall grades with a 90% or better. I feel these students have a good perception
of their abilities. The other girl that underscored herself is in the bottom two for girls in my class with an 81% overall grade. This student is new to the school and has never been in school before this year, so she has had to make some major adjustments. At the beginning of the year her curriculum was modified to help her be successful. I think she scored herself low because she lacks confidence in her abilities and is shy.

The whole class on average scored themselves on their rubrics at 9.2 of out of 10 points. However, there were some students who didn’t fall within the standard deviation. There were five students lower than the standard deviation including three girls and two boys. One boy is a lower achieving student with a 69% overall average in all subject areas while the other is in the middle group with a 78%. The student with the 78% average is new this year and started school with us just as I was starting this project. The other boy has been low achieving for many years and receives Title I help in some subject areas. Both of these students lack confidence. The three girls are actually all over the board grade-wise with an overall average in all subject areas being a 90%, 81% and 78%. Of the two lowest students in this group, one (81%) is new to school this year and is the same student I mentioned earlier in the above paragraph, while the other student (78%), has been in our school since kindergarten. This student has struggled throughout school, not being low enough to qualify for Title I assistance, but struggling on her own, especially with handing work in on time and confidence in her ability. What these five students have in common is that they all question their abilities and lack self-confidence when grading themselves on their student rubrics. With these particular students, reinforcement activities or lesson previews might help build their self-
confidence. Besides building self-confidence another benefit of these reinforcement activities might have been reflected in their rubric and test scores for science.

**Student Surveys**

Figure 4 shows the results for student pre versus the post surveys. At the time the students completed the post survey, I had not mentioned that their grades had improved during the treatment cycles. Had they known that their grades had improved during treatment cycles, I suspect that they would have scored higher on their surveys in the areas of self-assessment rubrics and daily participation grade.

**Figure 4.** Pre vs. post survey results, \((N=21)\).

When looking initially at the pre versus the post survey scores, 14 of the 21 students showed an increase in their scores from the pre to post survey. One student was exactly the same on both surveys and six students’ scores decreased from the pre to the post survey. Overall, the class average score increased from 31.1 in the pre survey to 33.0 in the post survey out of 44 points possible.
On the initial survey, there were five students, four girls and one boy that were higher than the standard deviation. Of these five students, two of them fell within the middle academic group and three in the high academic group. Of these five students, three of them, two girls and a boy, were also higher than the standard deviation on the post survey and all had an increase in their post survey score. This particular boy commented on using the rubrics: “I think they help us because they are there, they make us think about participation.” In my interview notes, I had noted that even though this student didn’t know if the treatment had improved his class scores, he still had a positive outlook regarding the treatment. This could occur because science is a high interest subject for this student. The scores for the two girls declined from their pre to post surveys. I believe this occurred because they didn’t think that the daily participation rubric grades helped them improve their grades. When looking over the students’ post surveys there was one common theme that came up regularly that I am sure affected the results of the post survey: students didn’t think that the rubrics helped improve their science grades as much as they thought they would as compared to the pre survey. As a result, students scored the question regarding the rubrics lower than they did on the pre survey.

On the pre survey, there were four students (two boys and two girls) that were lower than the standard deviation. Both boys are in the lower academic achieving group of students, while both girls are in the middle academic achieving group. One of the two boys has a very negative attitude toward school and has scored low in both the pre and post survey. He is the only student out of 21 that scored lower than the standard deviation on both the pre and post without showing any improvement or increase from
the pre survey, 16 points, to the post survey with 13 points. The second boy scored lower than the standard deviation on both, but did show a score increase from 17 on the pre to 27 on the post survey. Both of the girls’ scores improved from the pre to the post surveys, 22 to 30 and 23 to 38. These positive point changes could be due to familiarity of the survey, understanding the survey and vocabulary that goes with it, and an increase in treatment test scores as opposed to non-treatment.

On the post survey, there were three students that scored higher than the standard deviation, two girls and a boy, while there were four students, three boys and one girl that scored lower than the standard deviation. The three students that were higher all showed an increase in their survey score. These two girls are in the middle group academically while the one boy is in the high group. Of the four students who scored below the standard deviation on the post survey, the two boys I described in the above paragraph, one with a point increase and one with a point decrease. Both students fall into the low academic group. The third boy, and lowest academically, scored exactly the same on the pre and post survey. The girl was also low academically and in her first year in school. Her points decreased from the pre to the post survey. Academically, she was the second lowest girl and struggled to function at the fifth grade level. There were 6 students who had less than an 80% average grade in all subject areas, 5 boys and 1 girl. Three of the boys were low point outliers, falling into both categories: low academic group and poor participation. These three boys were still low, average below 80%, academically at the end of the school year. From these results, I conclude that it is possible that students who struggle academically also struggle in participation; that is, there is some evidence for a correlation.
Nonetheless, impact on the students themselves and their attitudes remains positive. The evidence can be seen by comparing the six implements: teacher treatment rubrics with teacher non-treatment rubrics; chapter test scores during treatment and non-treatment cycles; and pre and post surveys. In all these measurements there was a positive point increase on average for the whole class. The teacher non-treatment rubrics scored lower than student rubric scores. It is likely that when the students had to grade themselves the rubric reminded them that they were accountable for participation and their grade. The student treatment rubric average was 9.2, my treatment rubric average was 9.0, and the non-treatment average was 8.5. Additionally, when comparing the treatment chapter test scores versus the non-treatment test scores, the treatment chapter test scores were higher (average 85%) than the non-treatment test scores (average of 79%), showing a positive response to the treatment.

More specifically, the impact of student rubrics on the students were that some felt rushed to try to get the rubric and worksheets completed in the allotted time. During my post interview with one girl who fell into the high academic group she said, “At the end of class with worksheets and the rubric, I felt rushed that I didn’t have enough time to do them all.” Subsequently, this could have also affected the quality of work on their worksheets and rubrics. It was mentioned by a number of students that they found it hard to be honest all the time when trying to grade themselves. Despite this concern, all students interviewed, said that if they were the teacher they would use rubrics and daily participation grade. One girl responded, “I probably would so I could see if I need to do something better or if someone isn’t participating and I need to know and be a better teacher.” That is, she recognized the value of the rubric for teacher improvement. Some
students didn’t always turn in their rubrics or they left some questions unanswered or not explained, while other students thought that the rubrics didn’t help or affect their grades at all.

**Do Participation Rubrics Affect Test Scores?**

Student daily participation rubrics were used during treatment cycles but not during non-treatment cycles. The teacher rubric was used during treatment and non-treatment cycles. There is support for a correlation between implementing daily participation rubrics and higher science chapter test scores. The class average for chapter science tests during treatment was 85% while the class average during non-treatment cycles resulted in only 79%. When asked during interviews, all students, said that they thought that using the rubrics to take a daily participation grade improved their grade. One boy said, “Yes, uh, because then we can realize how participation in class can really help us when we get to the worksheets and stuff.”

There were only two students that did not show improvement in their chapter tests during the treatment cycles. These students, one boy and one girl, are among the highest achieving students in the subject of science. The boy’s score during treatment was 91% and 92% during non-treatment. The girl’s scores during treatment was 94% and 95% during non-treatment. During the course, I noted in my journal that I wasn’t seeing the gains with these two students as I was with the other students in class.

Four students, three boys and one girl, seemed to improve or benefit the most from the treatment cycle. The boy’s scores improved during treatment by 11 – 12 points and the girl’s by 26 points. Three of boys are all low achieving students with overall class averages below 76%. The girl’s overall class average was 81%. This was a huge
improvement for her because she’d never been in school before this year. I think this huge jump could be due to many reasons such as becoming familiar with school, feeling comfortable in the classroom environment, gaining confidence and making friends, and becoming familiar with how I teach. Perhaps the rubric and treatment cycles really helped her stay on task because she knew exactly what was expected.

The treatment was to implement student participation rubrics. The rubrics were designed to hold the students accountable for their participation and points earned for that day. The rubric became a constant reminder of what they should be doing and helped them stay on task. The exercise of the rubrics helped the boys the most because they are the students that are usually off task and struggle with focusing and sitting still. Out of all four boys interviewed, all of them agreed that if they were the teacher they would implement rubrics and a daily participation grade. This shows a positive attitude toward the rubrics and daily participation grade and an understanding of their purpose. One male student said, “Yes, uh, to know if students were paying attention or not, if they’re interested.” I noted in my journal, “The boys seem to be paying attention more because they have something to do to hold them accountable.” This is represented by the boys overall class average grades ranging from 69% - 86%. Only two boys were in the 80% range while the rest were lower. The five lowest overall class grades belong to five boys. This data helped me realize that there was a way to help get the males more involved in class and consequently bring up their grades. The positive results for the boys in my class convinced me the rubrics helped this particular group. I think that hands on inquiry based science learning would be a good way to keep boys involved and interested.
There were four females who scored higher than the average treatment test score of 85%. These students had test scores above 93%. These four students also carried overall class averages of 87% or greater which puts them into the higher academically achieving group. These students usually do well in most subject areas so this was not a surprise. There were three students, two boys and a girl, whose scores during treatment were lower than the standard deviation. Their scores were between 70-75%. Their overall class averages were 69%, 81% and 82%. The boy with the 69% always scores the lowest in all subject areas. The other two students struggle with science and their average science grade is less than their class averages. I think this is because those that struggle with reading find science a challenging subject due to the difficulty of the vocabulary. One student during a pre interview when asked what is the hardest part of the chapter grade said, “Um, reading aloud because I like read good silently but when I read aloud I don’t read as good.” This year we also are learning things in which the students do not have any prior knowledge to relate to, so mental mapping and initial understanding is more difficult. These students might benefit from a small group lesson or vocabulary preview. However, there is always the question of where to fit that activity into the day without those students missing out on another subject.

Impact on the Teacher

The next question I want to discuss is the impact on the teacher when using daily participation rubrics for a grade. There were several impacts on the teacher when initiating the treatment and non-treatment cycles. Since I didn’t use rubrics until the first treatment cycle, I didn’t realize right away what the implications were. I initially wasn’t
going to do the teacher rubric during non-treatment cycles, but changed my mind because I wasn’t sure how I would measure the difference in participation between treatment and non-treatment cycles. At first I had to streamline my initial rubric to make it more user-friendly. I noted in my journal, “I can’t keep track of one page for every student I observe. I need to put them all on one spreadsheet like a checklist or something I can circle.” I created the new spreadsheet and had my advisor take a look at it. Next, I decided that I would only grade half the class each day using the rubric; but then I found it was difficult keeping track of students without them knowing it or remembering who was done on what day, so I decided to try to do the whole class during both types of cycles. In my journal when I had started this on the first day I commented, “This is going to be harder than I expected and I need more time to be able to record what I see.”

During treatment and non-treatment cycles I realized how hard it was to actually grade the whole class for the day using the rubric. I noted this in my journal with comments like “This is taking forever. I can’t seem to see all the students all the time. I can’t seem to make sure everyone has their rubrics handed in before the next day;” and, “Students are handing in rubrics from different days without any dates on them.” I felt like there wasn’t enough time and I didn’t have enough eyes to watch everyone. I realized that I usually wasn’t in exactly the correct position to really know if the students were paying attention or not. I’ve also learned that sometimes they look like they are paying attention, when actually they are staring at their page but have taken a mini vacation to somewhere far, far away.

So when looking at the data of the average teacher non-treatment rubric scores, some of the larger discrepancies could be a result of the above mentioned issues.
However, when looking at my scoring during treatment (average 9.0 points) versus non-treatment (average 8.5 points), I believe that they scored lower during non-treatment cycles because the treatment wasn’t being used. By not having the rubric in front of them to remind them to participate, they kept lax in their participation. This was good to see, because it told me that the rubrics do make a difference. In the future, I need to find a way to make the rubric easier for both the students and I to use because keeping track became a very daunting task, consumed a lot of paper, and was difficult to record and stay on top of. I did develop a streamlined rubric but never used it (Appendix E). One way of streamlining the rubric might be to apply a snapshot; that is, use it only a couple times per each chapter or with only a certain number students at various academic levels. Another idea is maybe to limit the number questions asked on the rubric or simplify it.

A few of the major findings I noticed throughout my data analysis can best be expressed as follows. Most students improved during treatment cycles as evidenced by the positive change in their chapter test scores and their higher scores on the rubrics during treatment cycles. It also became apparent that the treatment helped my medium to low achieving students the most, which were mostly boys except for the one girl who had never been in school before. She made the biggest grade point advance out of the class, yet one boy and one girl, who have a high interest in science, actually decreased one percentage point. These were the only two students who didn’t show improvement. When interviewing the boy with high interest in science, I found that he was really eager to help me because I think he understood the importance of what I was doing, but his answers to my interview questions were not very yielding. When asked what was the biggest challenge and were the results accurate, he responded the same in both the pre
and post interview with, “It was hard because um being honest is hard because you want a better grade and might score yourself higher.”

The post interview responses were very similar to the pre interview in that some of the questions simply changed to past tense. The same number of students were not interviewed both times. Some of the major themes mentioned by students repeatedly in both interviews were: student honesty, being able to have some control over their grade, agreeing that it helped their grades to some extent, having the rubric in front of them reminded them to participate, and they thought participating helped them learn. They all said that if they were the teacher they would use a rubric too, but only one of them had a suggestion on how to change it. One boy, who was negative about school and the whole action research project, when asked how I could change my rubric during his final interview suggested, “Put in a question like why don’t you like to participate or something if they didn’t participate more or much.” When I asked him if he meant that I should add in questions as to specifically why students don’t like to participate he responded, “Yeah, because lots of the boys or some boys don’t participate much or I mean some people don’t participate much.” The biggest discrepancy that I found was the question regarding whether they thought that the rubrics had helped improved their grade. During the pre-interview, all students thought that it would help improve their grade. However, at the post interview, many didn’t feel as strongly that it had helped their grade. Their answers were vague: “Uh, sometimes-sometimes I participated a lot and sometimes I didn’t participate a lot” or “Yes, um, because like um, yes, my mind went blank, maybe a little bit.” This is partially my fault because I had not given them the results of their treatment chapter tests to compare to their non-treatment chapter tests. Most students
didn’t have any comments on how to improve this procedure. However, one girl said, “I needed more time, I felt rushed and that I couldn’t get it all done the worksheets and the rubric before the next thing.” I agree with her. I think giving the students more time would allow them to reflect more thoroughly on the lesson and their participation which could present more positive attitudes and more positive impacts for the student.

INTERPRETATION AND CONCLUSION

The purpose of this research project was to test whether using student self-assessment rubrics to take a daily participation grade to increase student participation would improve science grades. Interviews and surveys helped form a conclusion that these instruments do help.

The first research question regarding the impact of assigning daily participation grades to fifth grade science students resulted in many answers. Comparing the overall treatment test scores to the non-treatment test scores showed an improvement in all students except two. The treatment rubric scored 9.2 points compared to the non-treatment rubric score of 8.5 points. This shows the effectiveness of the treatment and also demonstrates a positive correlation between the daily participation rubric and chapter tests scores. The rubrics helped improve tests scores for many reasons. The rubrics were used for every lesson during the treatment cycles. Rubrics, allowed the students to have control over their rubric grades, while also prompting the students to participate more in class. The more they participated, the more likely they were to retain the information and the higher they could score themselves on their rubrics. On average, they scored themselves at 9.2 out of 10 points. By retaining more information, their test
scores improved. During the treatment, the average test score was 85.4% versus 79.2% for non-treatment test scores supported such improvement.

The second research question regarding the impact to students’ attitudes when given a daily participation grade showed that on average student attitudes improved. This is evidenced by comparison of the pre and post surveys, pre and post interviews, and the improvement in grades during treatment cycles. The survey scores improved from 31.1 to 33.0 from the pre to the post survey. Out of the 21 students, only 6 of the scores decreased from the pre to the post surveys. The area I saw the most change in these surveys was regarding the question about whether or not they thought the daily participation rubric helped improve their grades. In the pre survey students responded that they thought the daily participation rubric grades would help improve their science grades, but on the post survey, many students didn’t realize that it had actually improved their science grades. Had I told them about of improvements before the final survey was given, I think this would have changed their total point score.

The third research question regarding the impact on the students using the self-assessed participation rubrics, also showed many results. As stated above, there was an improvement in chapter test scores and rubrics during treatment cycles, evidenced by an increase was 8.5 to 9.2 points on the rubrics and 79.2% to 85.4% on tests. However, there were also other impacts on the students such as: time management, testing their honesty, and changes in attitudes regarding surveys and rubrics. One student said in both her interview and on her survey that she didn’t feel there was enough time to complete the rubrics and the lesson worksheets in the allotted time. In both the pre and post interviews and the surveys, students mentioned that using self-graded participation
rubrics were challenging because they would find it hard to be honest. In the initial survey, 7 of the 18 students mentioned that they would have difficulties being honest on their rubrics. This is another reason I thought it would be good to do a teacher rubric as well. Some of the possible reasons for differences between the teacher and student rubrics are differences in expectations between teacher and student, the students’ ability to be honest, and students possibly filling out the rubric incorrectly. However, giving them exposure to rubrics in the fifth grade will only help students improve accurately rating their abilities and increasing participation in activities throughout their academic career.

My fourth research question regarding the correlation between using the daily participation rubrics and chapter test scores during treatment and non-treatment cycles, resulted in significant findings. There was a 6.2% increase of chapter test scores during treatment cycles when the daily participation rubrics were used as compared to chapter tests scores during non-treatment cycles. The non-treatment chapter test score class average was 79.2%. This increased by 85.4% during treatment. This suggests a strong correlation between the treatment cycle and test scores; however, there are other factors such as unit content that could have also been a variable.

My fifth research question regarding the impact on the teacher when using rubrics and taking daily participation grades resulted in both good and bad impacts on the teacher. Most of these were discovered by trial and error. I realized once I was into my project there were things that needed to be changed. For example, using the teacher rubrics during non-treatment cycles to be able to compare with the treatment cycle rubrics or to change my position in the classroom to see if the students were paying
attention or day-dreaming. These were two changes I implemented midstream. I think
that we should be assessing these types of changes regardless of lessons we are teaching.
After making these changes, I realized the difference they made. Teaching is reflective
and if you don’t try new things or make changes you won’t be able to see if what you’re
doing is the best practice. I also decided that I needed to score a rubric on all the students
every day. However, with this decision I wasn’t fully aware of the difficulties I would
have trying to keep track of 21 students in 5 different areas. It was a daunting task, and
I’m not so sure I was always that accurate with it. I also didn’t realize how much data
that provided and how hard it would be to analyze all of it. In short, it became very
overwhelming to try to keep up with this process.

With that being said, I did find out that rubrics and daily participation grades do
have a place in the classroom to improve student grades and saw increased overall
participation as represented by their increased rubric and test scores. The difference was
not only seen in science, but they also seemed to participate more in other subject areas.
When rubrics weren’t completed student participation declined; so it had not yet become
a habit for them to volunteer to read, participate in class discussion, nor did they
understand the value of those actions for their learning. I feel this could be a very
valuable asset to a classroom if I could make the recording more manageable. Maybe a
snapshot of assessment would work, using the rubrics only a couple times in each chapter
(not on every lesson), or randomly choosing only a handful of students at various ability
levels to observe for completion of the teacher rubric.

The answer to my main question: what is the impact of assigning a daily
participation grade to students in fifth grade science is that it is worth the work to
improve the students’ grades and understanding of material. This improvement was demonstrated in the results from the treatment versus non-treatment, test and rubric scores, pre and post surveys, and pre and post interviews. An overall class increase in all of these areas demonstrates success in the treatment with improved attitudes and scores.

VALUE

This action research project validates some of the principles of science education such as: identifying a classroom problem, forming a hypothesis, testing that hypothesis with an action research project, and recording the results of the test. Action research demonstrates the scientific process, an important underlying structure supporting science education. Other principles of science education include sharing, the procedures of in the project so that it can be duplicated by others, analyzing the data to collect results, and including a conclusion that summarizes the project. At this point, support for the hypothesis can be ascertained. The conclusion I have drawn from my project leads me to think that I still have unanswered questions. Would I get better results if I allowed more time for completion? Would it be better to streamline the rubrics and simplify the vocabulary on the rubrics? What if I only included the rubrics and the daily participation grade with my lower achieving students?

This treatment could be used in all curriculum areas and at different grade levels. The participation rubrics are beneficial in helping the teacher assess how often students are really participating, and teaching students how to self-assess. The data from the rubrics help highlight two different measurements, chapter tests and rubric scores. These treatments help because increase chapter tests by 6% and rubrics by 0.7 points. When
used for other grades the rubric may need to be adapted appropriately. Since I’ve seen participation increase to other areas besides science due to the rubrics, I feel confident that this treatment could work in other subject areas. Self-evaluation is always a valuable asset for students to understand the connection between their participation and their grade. Self-evaluation added to the teacher’s evaluation helps students acquire responsibility for participation, investment in their grade scores, and honesty.
REFERENCES CITED


APPENDICES
APPENDIX A

INITIAL STUDENT INTERVIEW QUESTIONS
Initial Interview Questions
Participation in this research is voluntary and participation or non-participation will not affect a student’s grades or class standing in any way.
Name _____________________ Date _______________ Level _____

1. What can you tell me about your experiences at school, and how do you feel when you participate in classes?

2. Have you had previous classes where you participate in class? What can you tell me about this?

3. How do you feel about me taking a daily participation grade?

   Probe: Why do you feel that way?

   What are the advantages of such a grade?

   What about disadvantages?

4. How do you feel about using a grading rubric to grade yourself in daily participation?

   Probe: Do you feel that it would be accurate?

   Why or why not?

   Why do you feel that way?

5. Do you think that taking a daily participation grade will improve your overall chapter grades?

   Probe: Why do you think that way?

   For you, what is the hardest part of the chapter grade?

6. In your opinion, does participating in class discussion help you learn?

   Probe: Can you give me an example or two?

   Why do you think that?

7. In your opinion, do you think that taking a daily participation grade will help the teacher know if you understand the science lesson?

   Probe: Why do you think that?

   Have you ever had an experience where it did help the teacher?
If you were a teacher, would you use a participation grade?

Why or why not?

8. How do you think taking a daily participation grade will affect your learning?
APPENDIX B

STUDENT PRE SURVEY
Pre Survey #1
Participation in this research is voluntary and participation or non-participation will not affect a student’s grades or class standing in any way.
Name ____________________

Circle your answer.
1. I think being given a daily grade for my participation will encourage me to engage more in class.

  Strongly Agree  Agree  Undecided  Disagree  Strongly Disagree

  Why did you select the choice you did?

2. I think receiving a daily participation grade will improve my science grade.

  Strongly Agree  Agree  Undecided  Disagree  Strongly Disagree

  Why do you think that?

3. I feel like my level of participation in class is generally satisfactory.

  Strongly Agree  Agree  Undecided  Disagree  Strongly Disagree

  In what ways do you usually participate in class?

4. I think daily participation grades should be worth

  10 points  5 points  3 points  1 point

  Why do you think that?

5. I think class participation involves participating in daily class discussion.

  Strongly Agree  Agree  Undecided  Disagree  Strongly Disagree

  Why do you think that?

6. I think class participation means paying attention to the reader or speaker throughout the lesson.

  Strongly Agree  Agree  Undecided  Disagree  Strongly Disagree
Why do you think that?

7. I think that class participation means completing worksheet(s) or assignments completely.

Strongly Agree       Agree       Undecided    Disagree    Strongly Disagree

Why do you think that?

8. I think that participation means reading aloud or volunteering to read during the lesson.

Strongly Agree       Agree       Undecided    Disagree    Strongly Disagree

Why do you think that?

9. I think using a self graded participation rubric will help me participate in class more.

Strongly Agree       Agree       Undecided    Disagree    Strongly Disagree

Why do you think that?

10. I think a teacher graded rubric will be more beneficial to me.

Strongly Agree       Agree       Undecided    Disagree    Strongly Disagree

Why do you think that?

11. I think I will have the ability to accurately self-evaluate my participation in class.

Strongly Agree       Agree       Undecided    Disagree    Strongly Disagree

Why do you think that?  What problems do you think you’ll run into with trying to grade yourself?

12. What does participation mean to you? Describe what it looks like or means.
APPENDIX C

STUDENT PARTICIPATION RUBRIC
Student Participation Rubric

Name ________________________  Date _______________  Points ____/10

1. Did you participate in class discussion?

None (0)  One Time (1)  Two Times (2)  Three or More times (3)

In your opinion, was your participation of high quality? Why or why not?

2. Did you read or volunteer to read during the lesson?

No (0)  Yes (1)

Why did you not volunteer more?

3. Did you complete the worksheet(s) or assignments completely and hand them in on time?

No, Not Finished or Handed in (0)

Partially Completed and Not Handed in on time (1)

Completed but not Handed in on time (2)

Yes, Completed and Handed in on time (3)

What would you say was the greatest challenge in this process?

4. Did you pay attention to the reader or speaker throughout the lesson?

Not at all (0)  A little (1)  Somewhat (2)  A lot (3)

Please indicate why you selected the answer you did in the above question.
APPENDIX D

TEACHER PARTICIPATION RUBRIC
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<th>Date(s)</th>
<th>Student</th>
<th>Did the student participate in class?</th>
<th>Did the student read or volunteer to read?</th>
<th>Did the student pay attention to the reader or speaker throughout?</th>
<th>Did the student complete the W.S. or assignments completely?</th>
<th>Total Points (10pp)</th>
<th>Comments/Observation</th>
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APPENDIX F

IRB EXEMPTION
INSTITUTIONAL REVIEW BOARD
For the Protection of Human Subjects
FWA 00000165

MONTANA STATE UNIVERSITY
600 Technology Blvd Room 127
Immunochemistry & Infectious Diseases
Montana State University
Bozeman, MT 59717
Telephone: 406-994-7077
Fax: 406-994-4300
Email: cheril@mtu.edu

MEMORANDUM

TO: Tylene Welkens
FROM: Mark Quinn, Ph.D., Chair
Institutional Review Board for the Protection of Human Subjects
DATE: December 5, 2011
SUBJECT: How Taking Daily Participation Grades Affect 5th Grade Science Students [TW120511-EX]

The above research, described in your submission of December 3, 2011, is exempt from the requirement of review by the Institutional Review Board in accordance with the Code of Federal Regulations, Part 46, section 101. The specific paragraph which applies to your research is:

X. (b)(1) Research conducted in established or commonly accepted educational settings, involving normal educational practices such as: (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

X. (b)(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior. Unless: (i) information obtained is recorded in such a manner that human subjects cannot be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability, or bedamaging to the subjects' financial standing, employability, or reputation.

X. (b)(3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph (b)(2) of this section, if: (i) the human subjects are elected or appointed public officials or candidates for public office, or (ii) federal statute(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.

X. (b)(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available, or if the information is recorded by the investigator in such a manner that the subjects cannot be identified, directly or through identifiers linked to the subjects.

X. (b)(5) Research and demonstration projects, which are conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine: (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs.

X. (b)(6) Taste and food quality evaluation and consumer acceptance studies, if wholesome foods without additives are consumed; or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the FDA, or approved by the EPA, or the Food Safety and Inspection Service of the USDA.

Although review by the Institutional Review Board is not required for the above research, the Committee will be glad to review it. If you wish a review and committee approval, please submit 3 copies of the usual application form and it will be processed by expedited review.
APPENDIX G

STUDENT POST SURVEY QUESTIONS
Post Survey Questions
Participation in this research is voluntary and participation or non-participation will not affect a student’s grades or class standing in any way.

Name ______________________ Date _____________________ Level _____
Circle your answer.

1. I thought being given a daily grade for my participation encouraged me to engage more in class.
   Strongly Agree  Agree  Undecided  Disagree  Strongly Disagree
   Why did you select the choice you did?

2. I thought receiving a daily participation grade improved my science grade.
   Strongly Agree  Agree  Undecided  Disagree  Strongly Disagree
   Why do you think that?

3. I felt like my level of participation in class was generally satisfactory.
   Strongly Agree  Agree  Undecided  Disagree  Strongly Disagree
   In what ways did you usually participate in class?
   In what ways did you participate more as a result of the participation grade?

4. I think the participation grading was worth the points we were given.
   10 points  5 points  3 points  1 point
   Why do you think that?

5. I thought class participation involved participating in daily class discussion.
   Strongly Agree  Agree  Undecided  Disagree  Strongly Disagree
   Why do you think that?

6. I thought class participation meant paying attention to the reader or speaker throughout the lesson.
   Strongly Agree  Agree  Undecided  Disagree  Strongly Disagree
Why do you think that?

7. I thought that class participation meant completing worksheet(s) or assignments completely.
   
   Strongly Agree  Agree  Undecided  Disagree  Strongly Disagree
   
   Why do you think that?

8. I thought that participation meant reading aloud or volunteering to read during the lesson.
   
   Strongly Agree  Agree  Undecided  Disagree  Strongly Disagree
   
   Why do you think that?

9. I thought using a self graded participation rubric helped me participate in class more.
   
   Strongly Agree  Agree  Undecided  Disagree  Strongly Disagree
   
   Why do you think that?

10. I thought a teacher graded rubric was more beneficial to me.
    
    Strongly Agree  Agree  Undecided  Disagree  Strongly Disagree
    
    In what ways was it beneficial?

11. I thought I had the ability to accurately self-evaluate my participation in class.
    
    Strongly Agree  Agree  Undecided  Disagree  Strongly Disagree
    
    Why do you think that? What problems did you run into with trying to grade yourself?

12. What does participation mean to you? Describe what it looks like or means.

13. Is there anything else you would like to tell me about this process?
APPENDIX H

STUDENT POST INTERVIEW QUESTIONS
Post Interview Questions
Participation in this research is voluntary and participation or non-participation will not affect a student’s grades or class standing in any way.

Name_____________________  Date _____________________  Level_____

1. We tried this year a participation grade approach. What do you remember about it?
   Probe: Why do you remember that the most?

2. For you, what was the biggest help?
   Probe: Why do you think that is?

3. What was the biggest challenge?
   Probe: Why do you feel that way?

4. What might you recommend that I do differently if I use this again?
   Probe: Why do you suggest that?

5. How did you feel about me taking a daily participation grade?
   Probe: Why do you feel that way?
   What are the advantages of such a grade?
   What about disadvantages?

6. How did you feel about using a grading rubric to grade yourself in daily participation?
   Probe: Do you feel that it would be accurate?
   Why or why not?
   Why do you feel that way?

7. Do you think that taking a daily participation grade improved your overall chapter grades?
   Probe: Why do you think that way?
   For you, what was the hardest part of the chapter grade?
8. In your opinion, did participating in class discussion help you learn?

   Probe: Can you give me an example or two?

   Why do you think that?

9. In your opinion, do you think that taking a daily participation grade helped the teacher know if you understood the science lesson?

   Probe: Why do you think that?

   Have you ever had an experience where it did help the teacher?

   If you were a teacher, would you use a participation grade?

   Why or why not?

10. How do you think taking a daily participation grade affected your learning?

    Explain how.