

SHARED LEARNING TARGETS: EFFECTS ON STUDENT ACHIEVEMENT
WHEN LEARNING TARGETS ARE COMMUNICATED WITH STUDENTS

by

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ABSTRACT

A descriptive study that looks at the construction and use of student-shared learning targets for the immediacy of individual lessons and the effects they have on student achievement in the middle school science classroom. Being new to the use of student-shared learning targets, the researcher describes the results between treatment and non-treatment periods, making comparisons between the two periods, and reflects on the process and use of student-shared learning targets.

“The most effective teaching and the most meaningful student learning happen when teachers design the right learning targets for today’s lesson and use it along with their students to aim for and assess understanding” (Brookhart & Moss, 2012, p. 2).

INTRODUCTION AND BACKGROUND

Since becoming a teacher I have constantly struggled with grading methods and practices. Assigning students a letter grade based on omnibus objectives says little as to what the student knows, what they need to know, and what direction my teaching should take. I’ve spent a lot of time looking into how I can change my grading methods and would ultimately like to switch over to a standards-based grading (SBG) system, a system of reporting student proficiency in a number of learning goals (or standards). Currently I give students one grade on a test that assesses multiple skills and target areas we’re working on at the time.

Traditional Grade Book

STUDENT	Hmwrk 1	Hmwrk 2	Quiz 1	Hmwrk 3		Final Grd
Antonio P.	70%	78%	70%	75%		C
Arlene B.	76%	83%	76%	81%		B-
Benjamin P.	97%	95%	93%	98%		A
Bertha R.	70%	79%	70%	79%		C+

Figure 1. A traditional grade book will average a series of scores on various assignments and tests, then calculate a final overall assessment of a student’s performance without delivering an accurate picture of what the student learned (ActiveGrade, 2014).

The idea behind a SBG system is that at the end of the grading period

evidence exists on whether a student mastered the essential content necessary for the next level. You are focused on knowledge, not on points. In a traditional points-based grade book, as seen in Figure 1, you would find wide-ranging scores for homework and assessments covering several learning goals and grouped into one percentage. In contrast a SBG grade book, like in Figure 2, would focus on student understanding of individual concepts informing the teacher of which students have met standard and which students need further instruction (ActiveGrade, 2014).

SBG Grade Book













STUDENT	Add Like Fractions	Find Slope of Line	Find Area of Triangles
Antonio P.	 3.5	 3	 3
Arlene B.	 3.75	 2	 4
Benjamin P.	 4	 3.2	 4
Bertha R.	 3	 2	 2

Figure 2. With a SBG grade book the focus is on understanding of individual concepts by each student. This informs instruction by telling you which students have learned the concepts proficiently and which ones need further instruction (ActiveGrade, 2014).

To provide an example of the inefficiencies of a traditional points-based grading system, let's assume that 35 of 100 points on a test deal with patterns and 65 of the 100 points address data analysis. Now let's consider two students, both of whom have attained a score of 70. The first student might have acquired all 35 of the 35 points on patterns but only 35 of the 65 points on data analysis. The student has demonstrated a robust understanding of patterns but only a partial understanding of data analysis. The second student might have received only 5 of the 35 points on patterns but all 65 points on data

analysis. This student has demonstrated an opposite pattern. The convention of designing tests that involve more than one topic and then scoring these tests using the 100-point (or percentage) scale makes it impossible to gauge individual students' knowledge (Marzano, 2010, pp. 35-36).

However, as I have found out over the course of the year, developing a SBG system is too great of a task to take on in a single year. Finding the time to develop a SBG curriculum requires carefully designed learning targets, learning scaled rubrics, tiered assessments, methods for converting a SBG to traditional points-based grade, report cards, and so on. Being the only teacher in a science department for grades six through twelve and having to create six different lesson plans for each day, developing a complete SBG system during the school year just isn't feasible. For this reason I have decided to focus my action research study on just one element of standards-based grading: the implementation of carefully designed learning targets.

A shared learning target isn't just simply relaying the teaching objective to the students by writing it up on the board and/or telling students what the objective is in a sentence or two. Instead, when sharing learning targets with students the teacher is making sure that students comprehend what those objectives mean, as well as the criteria for mastering the objectives and how to get there. Rather than just having students repeat the objective, students should be able to understand the learning target and know what exemplary work looks like. They have to have a target, and know how to go about meeting that target.

I teach at a small school that has average class sizes between 10 and 16 students. Like most schools, students are placed in my classes by their grade level, although

sometimes two grade levels are grouped in one class and sometimes students are placed in a grade above or below their regular grade level in accordance with their math abilities. Every year I have mixed ability classrooms where I have to find ways to differentiate my instruction to meet all students' needs. It is therefore necessary to revise instructional methods and curriculum content each year to optimize learning in the variously structured classes. Currently when assessing a class with a spectrum of mixed abilities, such was the case this year, a traditional points-based system shortchanges students at the higher and lower-levels, assessing only the mean of the group. In a SBG curriculum, assessments are tiered, assessing students at a lower, middle, and higher level of thinking. This becomes an extremely formative assessment tool that helps the teacher regroup students based on their needs and makes differentiation more accurate and easy.

It is my intention to eventually develop a SBG system beginning by developing student shared learning targets. To determine the effectiveness of using shared learning targets I plan to teach and gather data for a period of time while I withhold the learning targets, and then again for an equal period of time while sharing the learning targets with the students. I believe that by sharing learning targets with my students their achievement will improve. However, I am interested in determining just how effective shared learning targets are in improving their overall achievement. I plan to share my results with my colleagues at work and my professional community through Montana State University.

A great analogy of learning targets is a global positioning system (GPS), you probably can't imagine taking a trip without it. Unlike a printed map, a GPS provides up-to-the-minute information about where you are, the distance to your destination, how long until you get there, and exactly what to do when you make a wrong turn. But a GPS

can't do any of that without a precise description of where you want to go. Think of shared learning targets in the same way. They convey to students the destination for the lesson—what to learn, how deeply to learn it, and exactly how to demonstrate their new learning. In our estimation (Moss & Brookhart, 2009) and that of others (Seidle, Rimmele, & Prenzel, 2005; Stiggins, Arter, Chappuis, & Chappuis, 2009), the intention for the lesson is one of the most important things students should learn. Without a precise description of where they are headed, too many students are "flying blind" (Brookhart, S.M., & Moss, C. M., 2011, p. 1).

Purpose Of Study And Focus Questions

The purpose of this study is to determine if student achievement will improve in my sixth and seventh grade classes when learning targets are shared with students. The focus question for this study is, "Does sharing learning targets with students help improve their learning?" The supporting questions are:

- How do shared learning targets affect student confidence?
- What effect does student-learning style have on using learning targets?

CONCEPTUAL FRAMEWORK

The use of and reinforcement of learning targets in the classroom is becoming a more common encounter and, in a lot of classrooms, a requirement. Students must know what is expected of them, what they will be assessed on and know how successful they are in their learning. "A shared learning target unpacks a "lesson-sized" amount of learning—the precise "chunk" of the particular content students are to master" (Brookhart, S.M., & Moss, C. M., 2011, p. 2). This allows students to focus on one learning expectation per day without getting things confused. Without providing students

with the learning target prior to the lesson students are flying blind, exhausting class time attempting to figure out what their teachers expect them to learn in that one given class period, often giving up in the process. In this type of situation the teacher is the only person in the classroom providing direction in student learning. By providing learning targets at the beginning of each lesson, students are able to help steer the direction of their learning.

The following is a vignette of one school's experience implementing learning targets into their daily lessons.

Teachers in the Armstrong School District in Southwestern Pennsylvania began embedding learning targets into their lessons in October 2009. When teachers began sharing learning targets with their students, their early efforts were tentative and inconsistent. Some simply paraphrased instructional objectives, wrote the target statements on the board, or told students what they were going to learn at the beginning of a lesson. Yet, even their exploratory attempts became game changers. When teachers consistently shared learning targets in meaningful ways, students quickly became more capable decision makers who knew where they were headed and who shared responsibility for getting there (Brookhart & Moss, 2011, p. 2).

Nearly a year and one half later, learning targets are everywhere: in lesson plans, on bulletin boards, in hallways, and firmly on students' minds. Most importantly however, is the transformation in students' approach to learning. Now that they know where they are going, they are more willing to do the work to get there. In a study conducted by Robert Marzano and his team of researchers, found that classrooms where

students understand the learning outcomes for daily lessons see performance rates 20 percent higher than those where learning targets were unclear (Marzano, 2003).

Although learning objectives (or learning targets/goals) are intended as models for all classrooms, the procedures are also incorporated in explicit instruction models (e.g., Archer & Hughes, 2011), which have become a hallmark of effective practices for students with learning disabilities (Carnine, Silbert, Kameenue, & Taver 2004; Swanson, 2001). Students experiencing difficulty seem to need a clear picture of where the lesson is headed and what they need to do to be successful. In fact, stating the lesson objective was one of three variables found to make significant contributions to student outcomes in special education settings (Englert, 1984). The purpose of setting the objective is twofold. First, teachers need to be cognizant of the goal of their instruction so that the lesson can be purposefully designed as a sort of road map to achieve that end (Vaughn & Bos, 2010). Second, because they are explicitly stated in behavioral terms, objectives serve as performance expectations that establish for the student and teachers, alike, what is expected of the learner as an outcome of the lesson components (English & Steffy, 2001). In essence, the objective ought to answer the question: How do we know if the student met a standard or mastered a concept (Reed, 2012)?

In a study of 150 high school students conducted by five teacher researchers over a nine-week period, the teacher researchers found that their class averages increased from 77% to 93%, which is an increase of 13%. This increase is similar comparing a student's grade changing from a C to an A grade. In addition, the teacher researchers succeeded in improving students' awareness of class material and expectations. In Week One of their study, 61% of students claimed that they were fully aware of daily expectations. In

contrast, by Week Nine, 70% of the 150 students were conscious of the desired learning objectives (Althoff, Sarah E., Linde, Kristen J., Mason, John D., Nagel, Ninja M., & O'Reilly, Kathleen A., 2007).

Although I have already completed my action research, one thing that I would have liked to have done that the above studies all seemed to do is to utilize surveys more frequently. I only gave one survey at the culmination of the study to my students. The previously mentioned study (Althoff, Sarah E., Linde, Kristen J., Mason, John D., Nagel, Ninja M., & O'Reilly, Kathleen A., 2007). utilized several surveys that were given to the students, parents and the teachers. I like the idea of including surveys for the parents and teacher. By giving surveys to the students, parents as well as yourself, the teacher, throughout the study you would have a well rounded representation of the effects of your study.

METHODOLOGY

The focus of the study was whether or not sharing student learning targets would affect student achievement in the middle school science classroom. In order to ensure that the study generated valid and reliable results the treatment required that learning practices remained consistent throughout the treatment and non-treatment periods. This being the case, the breadth of homework assignments, labs, and the number of assessments needed to be consistent in range between the two periods. The pace of the instruction remained somewhat consistent always covering around the same amount of material each week.

Treatment

During the non-treatment period the teacher withheld from sharing the learning

targets with the students for the given period of time. To contrast this with the treatment period the teacher shared the learning targets with the students for the given period of time. During treatment weeks each class day started with reviewing the learning targets, what learning targets we would be learning that day, and the methods for achieving mastery over them. For example, if the learning target from the previous day was, “*By the end of today’s lesson I’ll be able to explain three ways in which an object is said to be accelerating: a) speeding up, b) slowing down and c) if the object changes direction and thus changes velocity,*” I would begin a class by asking students to share with a neighbor the three ways in which an object is said to be accelerating and to provide an example. After a quick think-pair-share we would share-out as a whole group. From there the learning target for that day would be shared with the students: “*By the end of today’s lesson I’ll be able to solve and explain situations in which an object would be accelerating by speeding up.*” We would then spend time looking at various scenarios where an object is accelerating by speeding up and providing the class with time to independently practice as well as create their own scenarios to share. At the end of each day the learning target for the day and the methods were reviewed by briefly going over them as a class. In addition to the classroom assessments, students self evaluated their learning daily by using a four-point grading scale that measures student proficiency, see Figure 3.

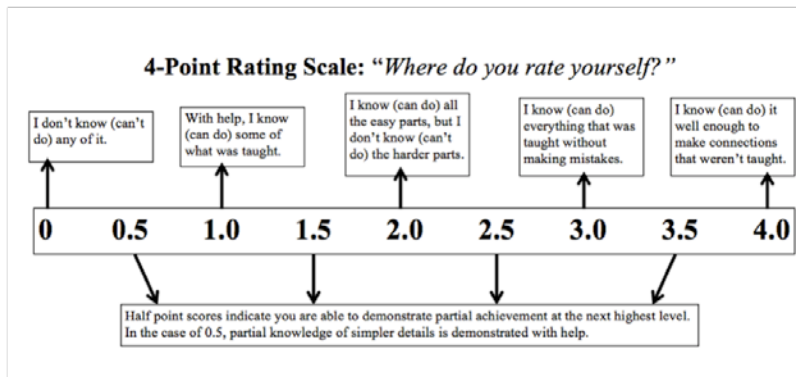


Figure 3. Four-point Self Evaluation Rating Rubric.

Examples of learning targets and assessments used can be found in Appendix A and Appendix B. All other classroom routines remained consistent during both treatments. During non-treatment weeks, learning targets were withheld from the students and the teacher was the only one who knew the daily learning target, or in this case teaching objective and direction of the lesson. Classes began *without* reviewing learning targets from previous days, as well as the learning target for that day. Students had to determine what the target for the day was on their own and on the go, perhaps not knowing the importance of the lesson until the end of class. The treatment periods rotated so that after a treatment a non-treatment followed, which then repeated for a total of two rotations each rotation lasting a week for a total of four weeks.

Instrumentation

Collection of data for treatment and non-treatment periods consisted of student pre and post assessments (Appendix B), student Likert surveys (Appendix C), student interviews (Appendix D), and teacher reflections. Two surveys were given, one to gather data on student learning styles and the second was designed to gauge student views in

three areas: student confidence in the science classroom, value and views on the use of learning targets and their effectiveness, and student metacognition towards learning in the science classroom. All three areas aim to gain a clearer understanding of the effects of sharing, or the absence of sharing, learning targets. The Likert survey was administered at the culmination of the four-week study and was only given once. If done over I would plan to administer Likert surveys throughout the study at the beginning and end of each week with the pre and post assessments. Pre-assessments were given to students at the beginning of the week and at the end of the week students took the same assessment as a posttest. The majority of the question items were in multiple-choice format. Although multiple-choice questions are a poor method to gain a clear understanding of what the student knows, they are objective and lend themselves to studies. Student interviews followed the survey and assessments. The interview questions were written as a follow-up to the treatment and non-treatment period, asking questions about the use of, or absence in having, the learning targets and the effects on their learning. The sample group selected for the interview questions was a mixture of eight sixth and seventh grade students having a range of abilities. The interviewees were chosen using a sample of convenience. Within the interview group I selected two of my high achieving students, two of my low achieving students, and four average achieving students in hopes that I had a strong representative of the whole study group of 26 students. Questions were designed to gain clarity from the student surveys, as well as following up on post assessment questions such as why students may have gotten certain questions wrong in hopes of placing less weight on poorly written questions.

The following is a data collection methodologies matrix for the study's research questions.

Table 1
Data Collection Methodologies Matrix

Research Questions	Data Collection Methodologies				
	Pre/Post Assessment	Learning Confidence Survey	Learning Style Inventory	Student Interviews	Teacher Reflection Journal
Does sharing learning targets with students help improve their learning?	X	X		X	X
How shared learning targets affect student confidence?	X	X		X	X
What effects does student-learning style have on using learning targets?	X		X	X	X

Demographics

The sample for this study involved students in grades six and seven, totaling 26 students. Fourteen students make up the sixth grade; nine females, and five males, fourteen students make up the seventh grade; six females and six males. One student is on an Individualized Learning Plan (IEP) and is accompanied by an aid in class. Ninety-two percent of the students are of Caucasian descent and 8% are of Hispanic-Latino descent.

Free and reduced-priced meals in May 2013 were 33% and special education was at 12.5% (Washington State Report Card, 2014).

Oakesdale contributes to the 41% of the nation's white wheat crop annually that is grown throughout Eastern Washington (Hill, K. 2013). Other than farming, Oakesdale has very little work opportunities and has become a bedroom community that has cheap and affordable living. Most families either commute north to Spokane, WA or south to Pullman, WA for work, both a forty-five minutes commute. Students who attend Oakesdale are well behaved and will generally have the same teacher in science for several years. This next year I will have had my sophomore students since sixth grade and at this point they know well of what to expect. Having well behaved and well acquainted classrooms in addition to small class sizes that average around ten students per grade makes for an ideal teaching experience where energy and efforts can be placed on learning rather than classroom management.

The reinforced and encouraged use of learning targets is new to Oakesdale and has been part of one of our staff professional learning community collaborative growth goals for the 2013-2014 school year. At the start of this study the use of learning targets in classrooms was at a minimum, and not purposeful. However, as the study went on students began to pick up the language and became familiar with their use and application towards learning.

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 E).

DATA AND ANALYSIS

In looking at my data for this study I have focused primarily on pre/post assessment data for the whole group as well as outliers in order to answer the focus question, “Does sharing learning targets with students help improve their learning?” To answer the first sub question, “How does sharing learning targets with students affect student confidence?” I looked at pre and post assessments in addition to Likert survey results, student interviews, and my teacher reflection journal. To answer the final sub question, “What effect does student-learning style have on using learning targets?” I looked at Likert survey results, student interviews, and my teacher reflection journal.

Focus Question:

“Does sharing learning targets with students help improve their learning?”

Pre/Post Assessments:

The non-treatment and treatment periods yielded comparable data. While both the non-treatment and treatment periods show a growth margin of at least 50% from pre test to post test, the non-treatment period, where learning targets were withheld, had a 5% greater growth margin of 55%. When putting the growth margins into an unpaired t test, the difference between the two was not statistically significant with having a p-value of 0.6714. The following is an elaboration on the above data.

To help answer the focus question, “*Does sharing learning targets with students help improve their learning?*” I took the difference between the pre assessment and post assessment data for each student and then came up with an average growth margin for each of them, representing their treatment and non-treatment average growth margin. I used these numbers to compare data (Table 2) to help answer the focus question.

Table 2
Average Growth Margin Data ($N = 26$)

Treatment Group:		Non-Treatment Group:	
Mean	2.13	Mean	3.19
Median	2.25	Median	3.00
Range	5.13	Range	5.50
Variance	1.50	Variance	1.97
Standard Deviation	1.22	Standard Deviation	1.40

To help look over the data I have included a boxplot below (Figure 4) that represents the data in Table 2.

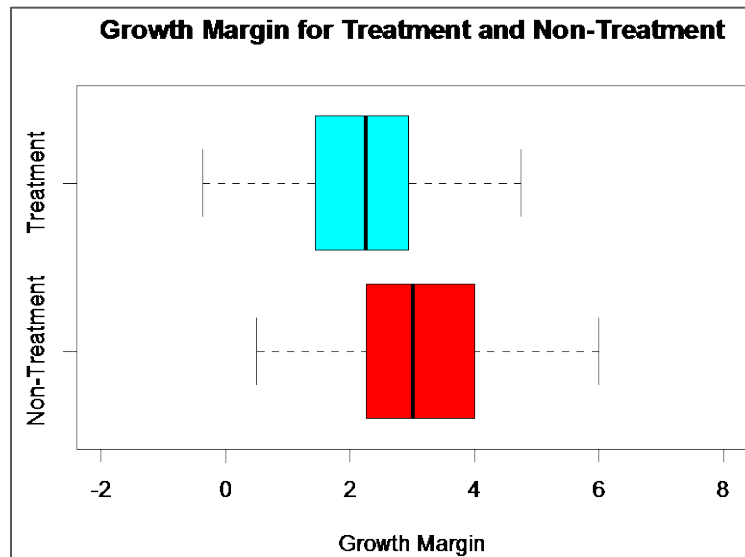


Figure 4. Growth Margin Data Using the Average Change in Score from the Pre to Post Assessments for the Treatment and Non-treatment Periods, ($N=26$).

If there were no change from pre to post assessment, than we would have more students show up on the zero axis of the above plot. I added an orange line so that this can be seen. However, all but one student during the treatment period had a positive

growth margin. This particular student was always within the standard deviation or above the standard deviation, and was in the middle of the group for the majority of the year. It was only because of one assessment that the student scored two marks below on a pre assessment that their growth margin average for the two assessments during the treatment period was negative 0.38 marks, or negative five percent growth. When looking at *Figure 4* and comparing the two treatments it is easily seen that the non-treatment period had a greater growth margin, but only by a slight amount.

The percent change from one period to another is calculated from the formula:

$$PR = \frac{(V_{Present} - V_{Past})}{V_{Past}} \times 100 \quad \text{Where:}$$

PR = Percent Rate
 $V_{Present}$ = Present or Future Value
 V_{Past} = Past or Present Value

Figure 5. Percentages Change from Pre to Post Assessment Equation Used (Calculating Growth Rates).

Looking at the percentage change in the growth rates between the pre and post assessment for both the treatment and non-treatment periods, I took the growth margins for each student used above as well as their pre and post assessment score and used the equation found in *Figure 5*. I put the percentage change calculations into a bar graph that can be seen in *Figure 6*, which provides a nice trend line showing the non-treatment period having a 5% greater growth margin of 55% than the treatment period of having a 50% growth margin. In *Figure 7*, you can see the same calculations in a boxplot that shows the percentage growth comparison to the original pre assessment score.

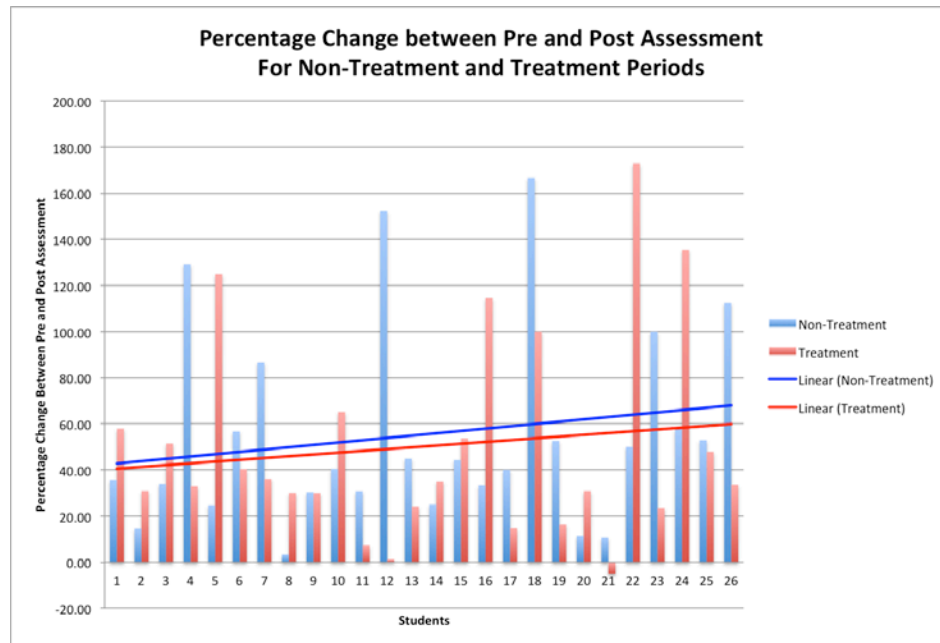


Figure 6. Average Percentage Change Between Pre and Post Assessments for Non-treatment and Treatment Periods, ($N=26$).

Although not statistically significant, these results suggest that non-treatment better supports student learning than shared learning targets. Due to the statistical insignificance, surveys and interviews were relied on more comprehensively in answering the focus questions, “Does sharing learning targets with students help improve their learning?”

As can be seen from the boxplot in *Figure 7*, there was a larger range and standard deviation on the treatment. Keeping in mind that the above boxplot in *Figure 7* is based on student growth between the pre and post assessments, having a larger range and standard deviation during the treatment could suggest that the treatment affects some students’ learning but not all of them. This idea is touched on again in the analysis of sub question two. Again we can see the student whom I previously spoke about whose growth margin during the treatment was below zero. All other students’ growth margin

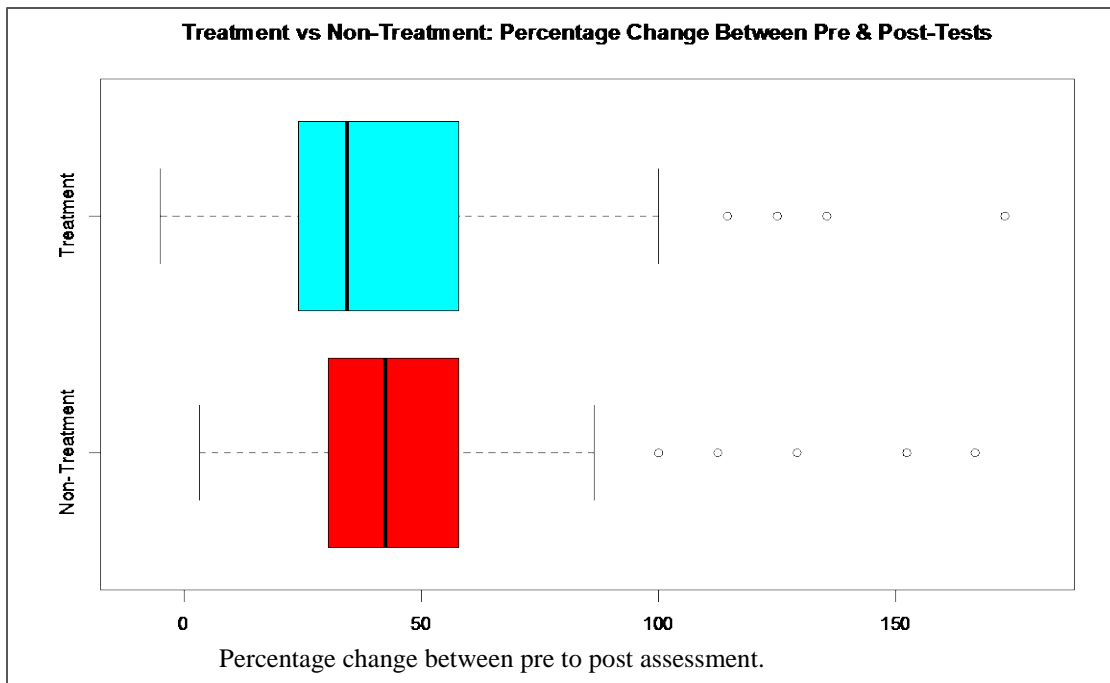


Figure 7. Boxplots Showing the Mean, Standard Deviation, and Outliers for the Treatment and Non-treatment Percentage Change Between Pre and Post Assessments, ($N=26$).

was positive. The four outliers that can be seen in the treatment in *Figure 7*, all experienced growth margins of more than 100% during the treatment. Looking at who these students are, I notice that some of it might just be coincidence however; the student with the largest growth margin of 173% is my IEP student. Possibly by having written learning targets and going over them daily this student was more equipped to take on the learning and therefore had tremendous growth gains. *Figure 7* suggests that sharing learning targets is beneficial to particular students and can have a profound effect on certain students' learning.

Below, *Figures 8a & 8b* show boxplots for non-treatment weeks when learning targets were withheld from students. In the first box, *Figure 8a* the standard deviation and range for the post assessment goes down by the end of the week. Meaning that during

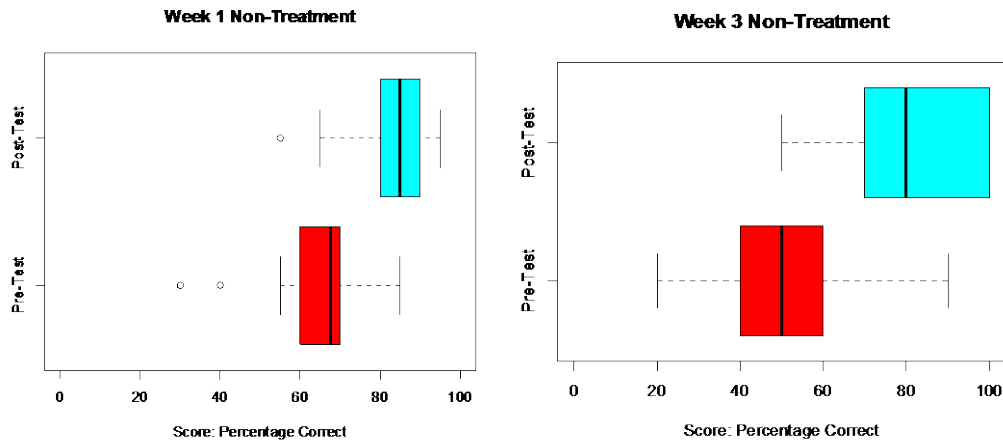


Figure 8a (left) and Figure 8b (right). Boxplots Showing Pre to Post Assessment Mean, Standard Deviation, and Outliers for Non-treatment Weeks, ($N=26$).

that time students were more consistent in their growth for that week. The outliers in Figure 8a during the pre assessment are my two lowest students; one of them is my IEP student mentioned previously. Both students made positive gains from pre to post assessment however they both remained below the standard deviation on the post assessment. My IEP student is the outlier.

In Figure 8b, the range during the pre assessment is greater than the post, however the standard deviation during the post assessment goes up. This suggests that although the range during the post assessment went down, students still maintained a separation in growth. The mean for the week went from 50% to 80%, however 12 of 26 students assessed above 80%.

Figures 9a & 9b show boxplots for treatment weeks when written learning targets were shared and gone over daily. In Figure 9a, the range and standard deviation increased. Also, the mean in Figure 9a only increases by about 10%, which indicates that

there wasn't a large growth during this treatment. One possibility is that the

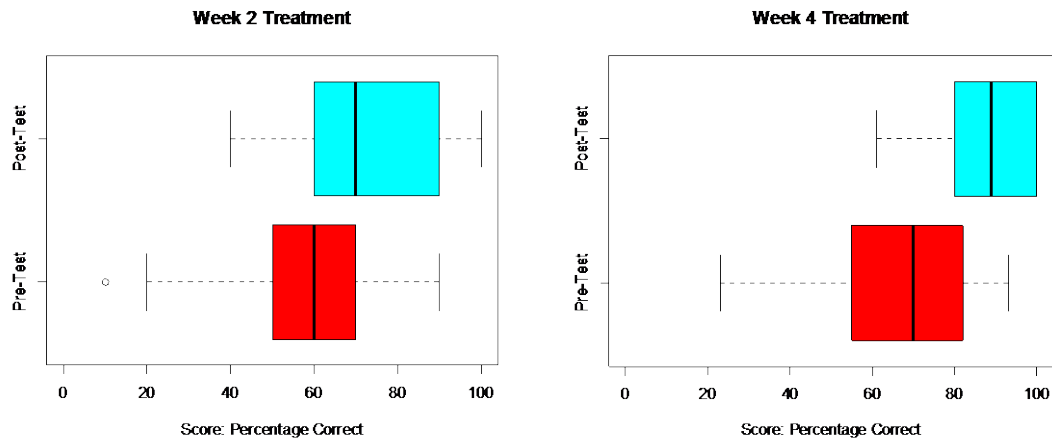


Figure 9a (left) and Figure 9b (right). Boxplots Showing Pre to Post Assessment Mean, Standard Deviation, and Outliers for Treatment Weeks, ($N = 26$).

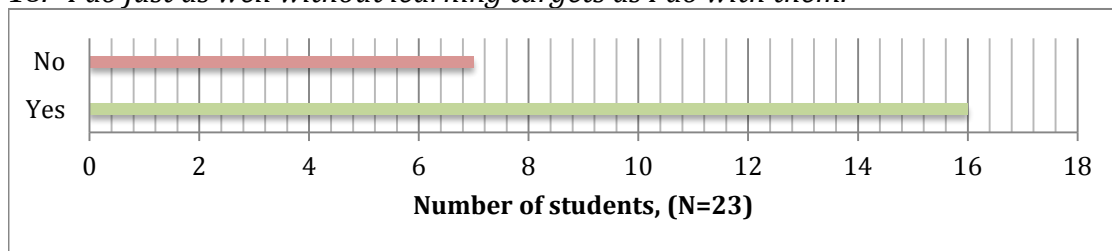
assessment was not in strong alignment with the treatment in Week 2. However, the increase in the standard deviation for the post assessment for *Figure 9a* may also indicate that sharing learning targets helped some students but not all of them. The outlier in the pre assessment is my IEP student who increased his score from the pre assessment to the post assessment by three marks. The other students below the standard deviation represent students my lower achieving students. The students above the standard deviation are a mixture of my higher achieving students as well as a couple of students who seemed to improve in their scores during the treatment when learning targets were shared.

Figure 9b, looks a lot better. It has a small range and tighter standard deviation for the post assessment. One possible reason for this is that the assessment was in strong alignment with the treatment in Week 4. It could also be that by the second week of the treatment period, when written learning targets were shared with students, that students

began to comprehend how to utilize and the effectiveness of using shared learning targets that their scores were all improved and near the ceiling of the assessment. It could also be that Week 4 is a coincidence and that the information being learned that week was easier to understand than the previous weeks. Three of the five outliers below the standard deviation in the Week 4 post assessment scored above 80%, but because the standard deviation is so tight they are just below. The other two students happen to have a high tactile modality learning style, one of which is one of my lower achieving students. My IEP student was within the standard deviation for Week 4 for both the pre and post assessment, which could support that by the second week of sharing learning targets the student began to become more familiar and comfortable with utilizing shared learning targets.

Survey Results:

18. *"I do just as well without learning targets as I do with them."*



20. *"I prefer learning when my teacher gives us learning targets."*

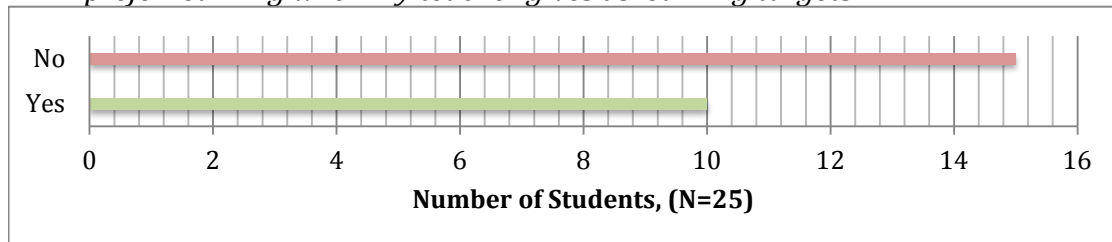
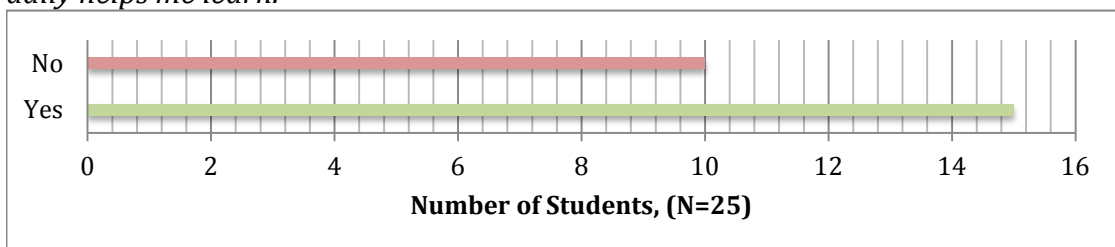


Figure 10. Student Responses to Likert Survey Questions 18 & 20 Looking at Their Perception on the Value of Learning Targets, Supporting the Absence of Learning Targets.

When grouping survey categories *strongly disagree* and *disagree* results as no and the *strongly agree* and *agree* results as yes, I was able to gain a more accurate understanding of the Likert results. The survey was administered at the end of the study to all of the students in grades six and seven. When looking at the focus question, “Does sharing learning targets with students help improve their learning,” students were given several straightforward Likert survey questions that gauged their perception on the value of learning targets. Impressively, 70% of students agree that they do just as well without learning targets and 60% of students prefer learning when their teacher *doesn't* provide them learning targets (*Figure 10*). One student said, “Only two teachers use learning targets often and other teachers use them on and off.” This may mean that thought students prefer learning when teachers don't share learning targets they also aren't used to their teachers using them. However, in contrast, 60% of the same students agree that

16. “Being given learning targets at the beginning of the week and going over them daily helps me learn.”



17. “When I have learning targets I know what I should focus on learning.”

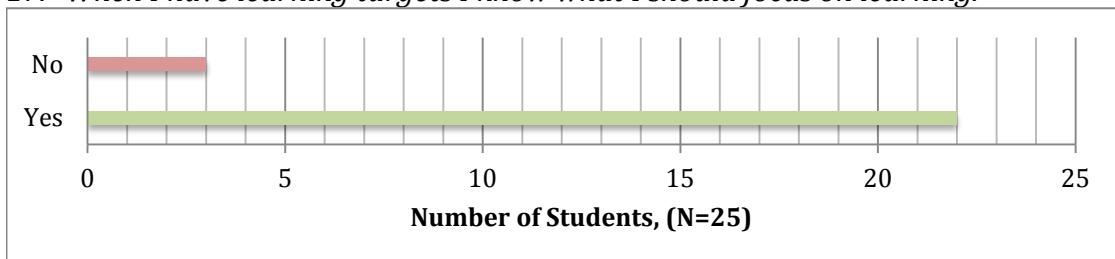


Figure 11. Student Responses to Likert Survey Questions 16 & 17 Looking at Their Perception on the Value of Learning Targets, Supporting the Use of Learning Targets.

being given learning targets and going over them helps them learn, and 88% agree that when they have learning targets they know what they should focus on learning (*Figure 11*). Although Figure 10 and Figure 11 don't agree with one another, both questions could indicate that students welcome the use of learning targets however; they are not needed in order for them to succeed. In addition to this, students may have been indifferent about the use of learning targets at the time of the survey. During the time of the survey teachers in our school were trying to increase the consistency of using learning targets daily. Being new to using learning targets, teachers and students alike may have had a transition period as they slightly altered their routine and began integrating them into their day. Although the students in this study do well and succeed without using learning targets, which can be also be seen in the pre and post assessments, they are open and willing to the practice of sharing learning targets.

Reflective Teacher Journal:

Looking over my journal two things stand out to me; 1) the pacing of instruction during the treatment was more purposeful with each day seeming to have a greater intent, and 2) Learning targets became a direct guide that helped instruction to stay in scope with the curriculum. I was more intent with my teaching. I reflected in my journal, "Learning targets help me teach with the end in mind making all of the days leading up to the end meaningful." Often teachers are presented with moments where the direction of a lesson is best when changed. However, when teaching with learning targets instruction that went off direction in hopes of developing comprehension and interest I was able to reconnect the new direction with the scope of the learning targets.

Sub Question 1:

“How does sharing learning targets with students affect student confidence?”

When looking at student confidence in the science classroom and comparing this data with the students' post assessment scores I noticed that even though some students post assessment scores are some of the highest in the classroom their confidence levels are fairly low. This is the opposite from what you'd expect. Of course there are students with high post assessment scores with high confidence levels, but it surprises me that students would have a low confidence level when the feedback they're getting from their assessments is high. For example, there is one student who scored an 88% cumulative for all four post assessments, treatment and non-treatment, but had a confidence level of *zero*. When looking at this particular student however, I notice that the student is a very meticulous student who would take an additional twenty minutes to finish the survey while making sure to be very accurate. It may be that the student isn't quite consciously aware of the effectiveness of learning targets at this point and it will take more time before their confidence levels go up from zero.

There are three outliers in question 17 of *Figure 11*, who answered *No* to the question, “When learning targets are shared I know what I should focus on learning.” One of the three students is a strong auditory learner and has to have very specific instructions and will often ask several times for clarification. I could see this particular student being very accurate in their answer and answering no because of the limited practice of using learning targets at that point. The other two students are average to high achieving students, but are both students who require a bit more practice and guidance

when picking up something new. Similar to the other student, I could see these students feeling that at the time of the survey they still didn't quite know how to effectively utilize shared learning targets.

Reflective Teacher Journal:

Creating the survey was a challenge for me. I wanted to include several areas in which to gather data from such as, student confidence, learning style, usefulness of learning targets, and in doing so I ended up putting off finalizing and proctoring a survey until the end of the study. I would have like to have created shorter and more purposeful surveys that were proctored throughout the study at the beginning and end of each treatment. By giving out the surveys more often students would have become more accurate at answering them as well as I would have greater validity in their answers. That being said, I think that the student confidence survey (Appendix C) and the modality learning style survey (Appendix F) provided me with enough data gain a clearer understanding from the study.

Sub question 2:

“What effect does student-learning style have on using learning targets?”

For the second sub question I used a modality inventory that assessed learning styles in three areas: visual, auditory, and tactile. When looking at and comparing assessment scores during the non-treatment and treatment periods to learning style data, there were five students who stood out. Each of these students was more successful during the treatment period when learning targets were visually shared with the students. All five of these students have a strong visual learning style. During the treatment period I provided each student with a list of the learning targets for the week. We would look at

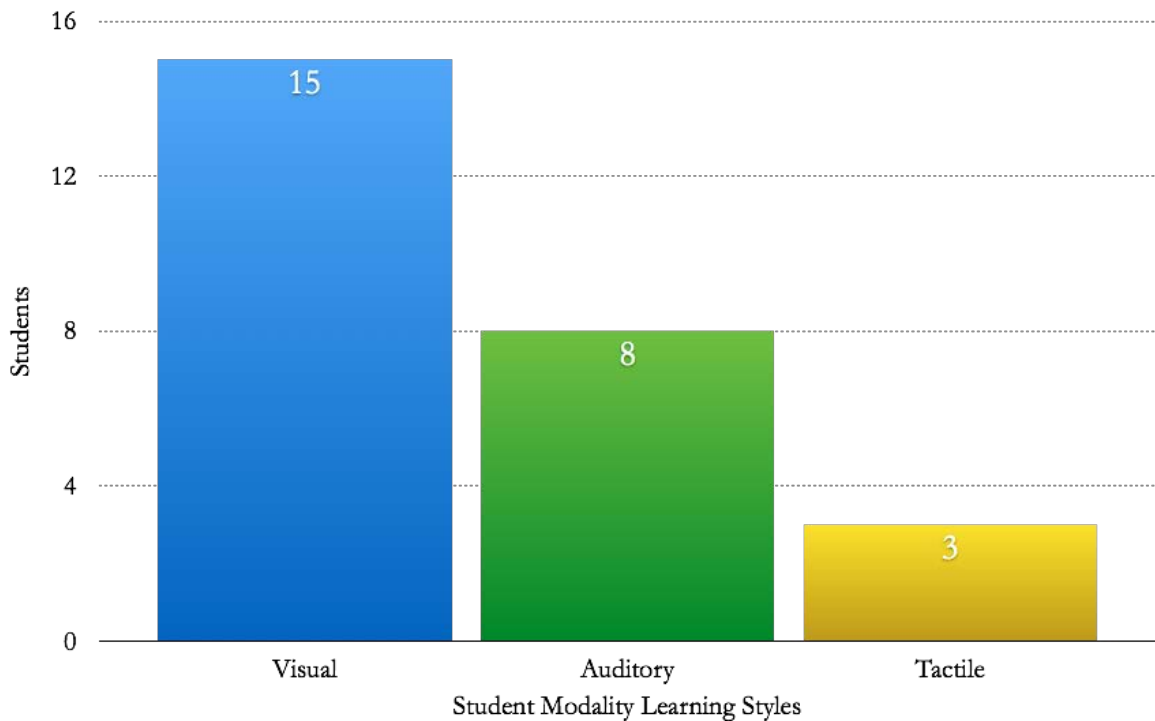


Figure 12. Bar Graph Showing the Learning Styles for the Students in the Study, ($N = 26$).

and go over these as a class daily. Looking to see if other visual learners may support this trend I looked at six additional strong visual learners in the study. When looking at the other six visual learners I noticed that their scores either remained high during the whole study, went from within the standard deviation to above the standard deviation during the use of learning targets, or their scores remained near the mean during the whole study. This seems to support that sharing written learning targets helps improve the learning of visual learners. When looking at the other modalities, auditory and tactile/kinesthetic, I noticed only one student who was below the standard deviation more during the treatment than the non-treatment. This particular student happens to be a strong auditory learner and generally assesses in the middle of the pack. This could have simple been due to the content that was being covered those weeks during the treatment, or the student

avored the non-treatment when learning targets weren't being shared. However, in this study, only one student doesn't make the situation statistically significant to support that written learning targets don't support the learning of auditory learners.

INTERPRETATION AND CONCLUSION

My hope was that the use of learning targets would impact all students. Instead, I found out that it impacts some students, some of the time. This is my first year attempting to use and perfect the implementation of learning targets. Through the process I have learned a lot; from my reading and research on the use of learning targets (professional journals/magazines, books, websites, etc.), my practice of using them, and gaining useful feedback from my students. The truth is that my study makes sense. It tells me that I'm not going to perfect the use of learning targets right away; that, instead, it's going to take time, and it most likely won't impact all the students. The fact that student post assessment scores had a large range and standard deviation during Week 2 but by Week 4 the range and standard deviation shrank and was near the ceiling of the assessment supports this. It also tells me that in my frustration of implementing them to my curriculum and daily routines - the time it takes to go over them daily (for lack of an established routine from years of practice), that it's going to take time before I see positive results that support the use of learning targets. I remember feeling frustrated in not knowing how to best share learning targets and concerned that I may not be doing what was best for my students. The literature tells me that they are effective, as do administrators, and my action research tells me I am in the process of learning how to use them. The Likert survey results –supporting the absence of using learning targets– may

support that students read the energy off of the teacher as well as become frustrated themselves when a routine hasn't been established in the classroom.

In answering the focus question, "Does sharing learning targets with students help improve their learning?" my data shows that learning targets can prove to be effective, however, some students had more significant improvements than others. While the majority students felt that they did just as well with learning targets as they did without them, students welcomed to the idea of using learning targets and felt that when they had learning targets they knew what they needed to focus on for the week and that by using them daily, their learning was improved.

Looking at the first sub question, "How does sharing learning targets with students affect student confidence?" my data supports that although some students' confidence level increased in science not everyone's did. Had the length of the study been increased and number of confidence surveys administered than I may have seen a more positive or negative result in the data. I do feel that a student's confidence in a subject would increase when the learning target is shared. By knowing what is being taught they are more able to focus on learning the subject matter and thus increase their confidence. Often times it seems as though some students during discussion zone out, thinking that if they're quiet they won't have to contribute to the discussions in class. This is reinforced when we call on the same students. However, by providing students with what is being taught for that day and telling the students, "This is what you are to think about for today," you'd think that more students would be thinking about what was being taught; looking for connections and making inferences, when learning targets are shared. Thus, increasing one's confidence.

The second sub question, “What effect does student-learning style have on using learning targets?” surprised me the most, yet I shouldn’t be. By providing students with a written copy of learning targets students who were strong visual learners benefited the most. They were able to read and follow along as we went over the learning targets daily. Also, by printing the learning targets (Appendix A) for the week on a sheet of colorful paper that was less likely to be lost, students knew where to look for the week’s learning targets. This and the fact that they were visual allowed students to concretely understand and utilize the learning targets, thus improving the learning of visual learners.

VALUES

My action research project has given me the opportunity to become more comfortable with sharing learning targets as well as a greater insight of how the use of learning targets would tie in with a standards-based grading system. By having a set of learning targets (or teaching objectives) designed and embedded into the curriculum I will easily be able to use those concepts as part of a SBG system by assessing student strengths of the learning target using a proficiency scale from one to four. The next step is to work on developing accurate assessments that are aligned with the learning targets so that assessment results are accurate. One way of doing this is by developing tiered assessments for each of the learning targets.

My study supports the use of learning targets for many students and by making them part of the daily routine I believe that I will see a positive impact on all student growth. My study only had a total of four weeks and to really determine the effectiveness of using learning targets I would have needed more treatment and non-treatment weeks; three at a minimum, and ideally five or more would have been great and made for a more

valid study. However, I believe that there is enough data to support the use of learning targets. Although not every student had huge gains in their learning, some students seemed to benefit from using learning targets as can be seen in the data analysis section.

At the beginning of next year I plan to also give a modality learning style inventory, which might help me and my students identify strengths (and weaknesses) in terms of using learning targets. This will help in the continuing to learn how best to use and present learning targets.

Although I still have some questions such as what are the most effective methods for sharing learning targets, the next step toward a SBG system is focusing on developing meaningful assessments that match the learning target/goal. This could be the most challenging element of a SBG system. To accurately assess a classroom of students with a range of abilities requires that assessments be tiered. That is, the assessment is a differentiated, scaffolded assessment, targeting the student's proficiency level on a topic. This can be done as a summative check to a unit as well as a daily exit slip aimed at the learning target.

I have come away from this experience with a greater insight and appreciation for action research. I realize that this is truly about the teacher. I also have lots of ideas of how I would go about this study differently if I were to do it again. For example, daily learning targets are meant to be daily; therefore I would have had my control and treatment days rotate one after another so that there would be three control days and two treatment days or three treatment days and two control days per week. I would also have given daily Likert surveys with each treatment/control, always being the same so that students became familiar with them and accurate at responding to questions. Also daily

entrance and exit slips would have been given that gauged each the student's achievement on that day's learning target: one at the end of the period that gauges student understanding for that day and one at the beginning of the period that gauges the student's ability to learn over that evening (possibly even tiered questions). Attached to the entrance slip would be a short list of checkboxes that asked students whether they completed their homework and if it was helpful (whether they studied). At the end of the study I would then hold interviews with students focusing on control versus treatment days (sharing learning targets and then withholding learning targets), and basing my questions on a cumulative of assessment results and Likert survey results. Although I may not actually carry this study out again, I am able to apply what I have learned to other areas in my teaching and through the process become a better educator.

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APPENDICES

APPENDIX A

LEARNING TARGETS USED FOR TREATMENT WEEKS TWO AND FOUR

Appendix A
Learning Targets Used For Treatment Weeks Two and Four

Week Two Learning Targets

Middle School Physical Science - Chapter 1 Section 3 Learning Targets

Acceleration

I know ...

What kind of motion acceleration refers to?

To be able to do this, I must learn and understand ...

- Increasing speed- object accelerates
- Decreasing speed- object accelerates (or decelerates/ negative acceleration)
- Changing direction- object accelerates (change in velocity)

How to calculate acceleration?

To be able to do this, I must learn and understand ...

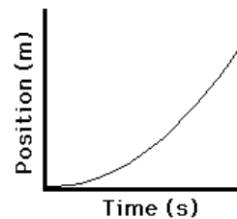
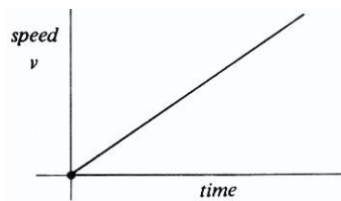
- Acceleration is a the change in velocity over time

$$A = \frac{V_f - V_i}{t}$$

Which graphs can be used to analyze the motion of an accelerating object?

To be able to do this, I must learn and understand ...

- Both speed-versus-time graph and distance-versus-time graphs can be used
- Speed-versus-time: *straight line* on the graph represents a change in speed over time, therefore acceleration.
- Distance-versus-time: *curved line* on the graph represents a change in speed over time, therefore acceleration.



Week Four Learning TargetsFriction & Gravity -Learning Goals and Targets

I know...

□ What factors determine the strength of the friction force between two surfaces?

To be able to do this, I must learn and understand ...

- Friction is a force that opposes motion.
- How hard surfaces push together affect the strength of friction.
- Some surfaces have greater friction than others, affecting the strength of friction.
- Static friction & Kinetic friction (rolling, sliding, and fluid).

□ What factors affect the gravitational force between two objects?

To be able to do this, I must learn and understand ...

- Smaller bodies of mass are attracted to larger bodies of mass; mass has an affect on gravity.
- Closer bodies of mass have a greater gravitational attraction than further bodies of mass; distance has an affect on gravity.
- Weight is measurement of an objects mass and the *current* gravity (*an objects mass never changes but its weight can depending on the gravity*).

APPENDIX B

PRE/POST ASSESSMENTS USED FOR TREATMENT AND NON-TREATMENTS

WEEKS ONE THROUGH FOUR

Week One Assessment – Non-Treatment

Name: _____ Date: _____ Period: _____

Middle School Physical Science - Chapter 1 Section 1 Quiz**Multiple Choice:** *Circle the correct response below.*

1. The state in which one object's distance from another is changing.

a. Speed	b. Motion
c. Reference point	d. Metric system

2. A _____ is a place or object used for comparison to determine if something is in motion.

a. Speed	b. Motion
c. Reference point	d. Metric system

3. _____ is the rate at which an object is moving at a given instant in time.

a. Speed	b. Instant Speed
c. Average Speed	d. Motion

4. _____ is the total distance traveled divided by the total time.

a. Speed	b. Instant Speed
c. Average Speed	d. Motion

5. Speed in a given direction is called:

a. Velocity	b. Speed
c. Average Speed	d. Motion

6. The most appropriate unit to measure the distance a snail would travel in one minute would be:

a. Meter	b. Kilometer
c. Millimeter	d. Pounds

7. The most appropriate unit to measure the distance a plane would fly in one hour would be:

a. Meter	b. Kilometer
c. Millimeter	d. Force

8. How many centimeters are in two meters?

a. 100	b. 200
c. 2 000	d. 0.200

9. How many kilometers are in 2 meters?

a. 2,000	b. 0.002
c. 0.200	d. 200

10. What is equal to 10 centimeters?

a. 0.100 meters	b. 20 millimeters
c. 100 millimeters	d. 10 millimeters

11. The correct equation for solving for speed is:
 a. distance \times time b. distance \div time
 c. time \times speed d. time \div distance
12. The correct equation for solving for distance is:
 a. distance \times time b. distance \div time
 c. time \times speed d. time \div distance
13. The correct equation for solving for time is:
 a. distance \times speed b. distance \div speed
 c. time \times speed d. speed \div distance

Short Answer: *Solve the following problems.*

14. Explain the difference between speed and velocity.
15. A cyclist traveled 13 kilometers during the first hour, and then traveled 32 kilometers during the next 2 hours. What was the cyclist's average speed?
16. A skier leaves the mountain at 4 pm and heads for home traveling at an average speed of 80 km/hr. At what time should they arrive at home if they have to travel a distance of 160 km?

Use the graph, "Dan's Walking Trek" to answer questions 17-20.

17. a. Describe Dan's speed between 0-2 km from home.
 b. Describe Dan's speed between 2.5 hours and 3.5 hours
18. What is Dan's speed between 0-1 hours?
19. What is Dan's average speed for his walk?
20. Make up a story describing Dan's walk that explains his motion.

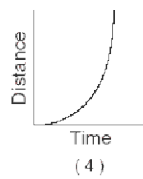
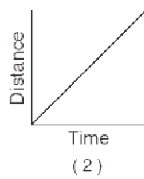
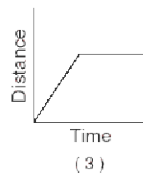
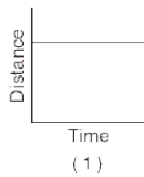


Week Two Assessment – Treatment

Name: _____ Date: _____ Period: _____

Middle School Physical Science - Chapter 1 Section 2 Assessment**Multiple Choice:** *Circle the correct response below.*

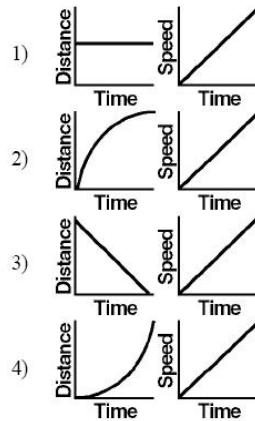
- _____ is the rate at which velocity changes.
 - Speed
 - Motion
 - Acceleration
 - Gravity
- A jogger was traveling at a speed of 4 m/s but realized that they needed to speed up. In a matter of 2 seconds the jogger was traveling at a speed of 8 m/s. What was their acceleration?
 - 4 m/s²
 - 2 m/s²
 - 8 m/s²
 - No change in speed
- The way in which acceleration doesn't take place is when
 - Increasing Speed
 - Constant Speed
 - Decreasing Speed
 - Changing Direction
- Which graph below shows an object that is accelerating?
 - 1
 - 2
 - 3
 - 4
- A downhill skier reaches the steepest part of a trail. Her speed increases from 9 m/s to 18 m/s in 3



seconds. What is her average acceleration?

- 9 m/s²
 - 18 m/s²
 - 3 m/s²
 - No change in speed.
- What does m/s² stand for?
 - miles per second
 - meters per second
 - meters per second per second
 - miles per second per second
 - Which of the following is an example of deceleration?
 - Increasing speed
 - No motion

7. Which of the following is an example of deceleration?
- Increasing speed
 - No motion
 - Decreasing speed
 - Constant speed
8. An object is accelerating
- Only when its speed changes
 - Only when its direction changes
 - If its velocity is large
 - When its speed or direction changes
9. When a car slows down at a traffic light, it is:
- decelerating
 - decreasing its displacement
 - traveling at constant velocity
 - changing direction
10. Which of the graphs represents the same motion?
- 1)
 - 2)
 - 3)
 - 4)



Week Three Assessment – Non-Treatment

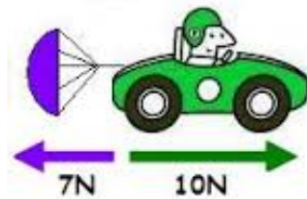
Pre/Post

Name: _____ Date: _____ Period: _____

Middle School Physical Science - Chapter 2 Section 2 Assessment

Multiple Choice: *Circle the correct response below.*

- Like velocity and acceleration, a _____ is described by its strength and by the direction in which it acts.
 - Weight
 - Motion
 - Force
 - Gravity
- A push or pull is measured in which SI unit?
 - Liter
 - Pound
 - Gram
 - Newton
- Vector (or arrows) represent a force's _____ and _____.
 - Speed, Direction
 - Gravity, Weight
 - Strength, Direction
 - Speed, Acceleration
- The net force in the image below is:
 - 7 N left
 - 3 N left
 - 10 N right
 - 3 N right
- The net force in the image below is:
 - 100 N left
 - 100 N right
 - 200 N
 - 0 N



- _____ acting on an object result in a net force and cause a change in the object's motion.
 - Net Forces
 - Motion
 - Unbalanced Forces
 - Balanced Forces



7. The combination of all forces acting on an object is called the:
- a. Resultant
 - b. Total Force
 - c. Weight
 - d. Net Force
8. _____ acting on an object do not change the object's motion.
- a. Net Forces
 - b. Motion
 - c. Unbalanced Forces
 - d. Balanced Forces
9. You exert a force of 120 N on a desk. Your friend exerts a force of 150 N in the same direction. What net force do you and your friend exert on the desk?
- a. 300 N
 - b. 270 N
 - c. 30 N
 - d. 0 N
10. The unit abbreviated, N, represents:
- a. Net Force
 - b. Newton
 - c. Nitrogen
 - d. Nothing

9. Give an example in which friction is good. Explain why it is good.

10. Give an example in which friction is bad. Explain why it is bad.

11. If you went to the Moon, would your weight and/or your mass be the same as it was on Earth? Explain.

APPENDIX C

STUDENT CONFIDENCE LIKERT SURVEY

Appendix C

Student Confidence Likert Survey

Name: _____

Student Learning Survey!

For each item identified below, circle the number to the right that best fits your judgment of its quality.

Use the rating scale to select the quality number that matches your level. Participation in this survey is optional.

1= strongly disagree, 2= disagree, 3= agree, 4= strongly agree

Survey Item	Scale			
1. I enjoy science class.	1	2	3	4
2. Outside of assigned practice, I study at home to help increase my understanding of the learning targets in science.	1	2	3	4
3. The methods my teachers use to grade are consistent with each other.	1	2	3	4
4. Science is one of my stronger subject areas; I do well in science.	1	2	3	4
5. I visit my science teacher outside regular class hours (<i>e.g., lunch, before/after school, etc.</i>) to get help, retake assessments, or show an improvement in my learning through self-generated assessments ¹ .	1	2	3	4
6. My parents/guardians ask to see and discuss my report card with me.	1	2	3	4
7. I pay close attention to feedback I get on practice work and assessments that are returned to me in order to see how I can improve my learning.	1	2	3	4
8. I feel confident in my ability to improve and do well in science.	1	2	3	4
9. The methods my teachers use to grade are fair and communicate to me what I “do & don’t” know.	1	2	3	4
10. I refer to the learning targets and rubrics in order to ensure that my learning is on target.	1	2	3	4
11. Report cards in science help communicate what I “do & don’t” know.	1	2	3	4
12. I look forward to getting, and sharing my report card in science.	1	2	3	4
13. I refer to the learning target’s corresponding rubric to help keep track of my learning as well as what I can do to improve my learning.	1	2	3	4
14. Science report cards help guide my learning; they inform me of the learning targets I need to practice and improve on.	1	2	3	4
15. I feel comfortable sharing my thinking in science class.	1	2	3	4
16. Being given learning targets at the beginning of the week and going over them daily helps me learn.	1	2	3	4
17. When I have learning targets I know what I should focus on learning.	1	2	3	4
18. I do just as well without learning targets as I do with them.	1	2	3	4
19. My other teachers use learning targets daily.	1	2	3	4
20. I prefer learning when my teacher gives us learning targets.	1	2	3	4

!

21. In your own words, how does the use of learning targets affect your learning?

=====

¹In such a situation, a student approaches the teacher and proposes what he or she will do to exhibit a specific level of performance on the proficiency scale for a particular learning target.

22. Do you ever feel lost in a lesson, even while using learning targets? Explain.

23. How might your level of confidence in a subject be influenced by your report card? Explain.
!

APPENDIX D
STUDENT INTERVIEW QUESTIONS AND HIGHLIGHTED RESPONSES

Appendix D
Student Interview Questions And Highlighted Responses

Do any of your other teachers use learning targets?

- “No. Well, they write them on the board. Mrs. Brown does.”
- “Only two teachers use learning targets often and other teachers use them on and off.”

How do you think learning targets *are/could* be helpful?

- “They help keep you on task and help you know what you’re going to be doing and learning.”

If your teacher were going to use learning targets, how would you prefer they are communicated with you?

- “Having a copy of them.”
- “Saying them out loud and writing on board.”
- “Written targets are left on the board and then added/removed the next week. Which is helpful for if you miss a day.”

If the grade book were setup so that the majority of what you were graded on was ‘how well you knew the learning target,’ do you think grading would be fairer? (*In other words, your report card would focus on the mastery of learning targets rather than worksheets, homework, etc.*)

One Response:

- “I would rather be graded the traditional way- because that way I’d do my homework, and participate.”

A: If the grade book was setup so that a certain percentage was based on participation (i.e., homework, labs, etc.) would that change your mind?

- No real response from student(s).

Other Response:

- “It would be a lot more stressful if our grades were based on the learning targets, because if you were strong on all of the learning targets but one your grade would suffer.”
- “If you didn’t know one of the learning targets, but understood the other targets your grade would lower.”

B: What if you could take an assessment for *that* learning target as many times as you wanted, within a period of time, in order to bring your grade up? You would also probably learn *that* learning target.


- Again, no real response from the students. I think that this was a bit beyond them and it was difficult for them to conceptualize what this grade book would look like.

Lastly, do you think your grades in all of your classes would be better?

- “Yes, it would help me focus on what I need to get done.”
- “It would be better to have learning targets, because they would help us know what we’re expected to learn and keep us on target.”

APPENDIX E
INSTITUTIONAL REVIEW BOARD EXMPTIONS

Appendix E Institutional Review Board Exemption

 <p>MONTANA STATE UNIVERSITY</p>	<p>INSTITUTIONAL REVIEW BOARD For the Protection of Human Subjects FWA 00000165</p>	<p>960 Technology Blvd. Room 127 c/o Immunology & Infectious Diseases Montana State University Bozeman, MT 59718 Telephone: 406-994-6783 FAX: 406-994-4303 E-mail: cherylj@montana.edu</p>
		<p><i>Chair:</i> Mark Quinn 406-994-5721 mquinn@montana.edu</p> <p><i>Administrator:</i> Cheryl Johnson 406-994-6783 cherylj@montana.edu</p>
MEMORANDUM		
TO:	Cameron Burns and Walt Woolbaugh	
FROM:	Mark Quinn, Chair <i>Mark Quinn CJ</i>	
DATE:	December 12, 2013	
RE:	"Shared Learning Targets: The Effects on Student Achievement When Learning Targets Are Communicated With Students" [CB121213-EX]	
<p>The above research, described in your submission of December 12, 2013, 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:</p>		
<p><input checked="" type="checkbox"/> (b) (1)</p> <p><input checked="" type="checkbox"/> (b) (2)</p> <p><input type="checkbox"/> (b) (3)</p> <p><input type="checkbox"/> (b) (4)</p> <p><input type="checkbox"/> (b) (5)</p> <p><input type="checkbox"/> (b) (6)</p>	<p>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.</p> <p>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 can 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 be damaging to the subjects' financial standing, employability, or reputation.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>Taste and food quality evaluation and consumer acceptance studies, (i) 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.</p>	
<p>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.</p>		

APPENDIX F
LEARNING STYLE MODALITY SURVEY

Appendix F

Learning Style Modality Survey

Learning Style Inventory

To better understand how you prefer to learn and process information, place a check in the appropriate space after each statement below, then use the scoring directions at the bottom of the page to evaluate your responses. Use what you learn from your scores to better develop learning strategies that are best suited to your particular learning style. This 24-item survey is not timed. Respond to each statement as honestly as you can.

	Often	Sometimes	Seldom
1. I can remember best about a subject by listening to a lecture that includes information, explanations and discussions.			
2. I prefer to see information written on a chalkboard and supplemented by visual aids and assigned readings.			
3. I like to write things down or to take notes for visual review.			
4. I prefer to use posters, models, or actual practice and other activities in class.			
5. I require explanations of diagrams, graphs, or visual directions.			
6. I enjoy working with my hands or making things.			
7. I am skillful with and enjoy developing and making graphs and charts.			
8. I can tell if sounds match when presented with pairs of sounds.			
9. I can remember best by writing things down.			
10. I can easily understand and follow directions on a map.			
11. I do best in academic subjects by listening to lectures and tapes.			
12. I play with coins or keys in my pocket.			
13. I learn to spell better by repeating words out loud than by writing the words on paper.			
14. I can understand a news article better by reading about it in a newspaper than by listening to a report about it on the radio.			
15. I chew gum, <input type="checkbox"/> or snack while studying.			
16. I think the best way to remember something is to picture it in your head.			

17. I learn the spelling of words by “finger spelling” them.			
18. I would rather listen to a good lecture or speech than read about the same material in a textbook.			
19. I am good at working and solving jigsaw puzzles and mazes.			
20. I grip objects in my hands during learning periods.			
21. I prefer listening to the news on the radio rather than reading the paper.			
22. I prefer obtaining information about an interesting subject by reading about it.			
23. I feel very comfortable touching others, hugging, handshaking, etc.			
24. I follow oral directions better than written ones.			

Scoring Procedures

Directions: Place the point value on the line next to the corresponding item below. Add the points in each column to obtain the preference score under each heading.

OFTEN = 5 points SOMETIMES = 3 points SELDOM = 1 points

VISUAL		AUDITORY		TACTILE	
NO.	PTS.	NO.	PTS.	NO.	PTS.
2		1		4	
3		5		6	
7		8		9	
10		11		12	
14		13		15	
16		18		17	
19		21		20	
22		24		23	
VPS =		APS =		TPS =	
VPS = Visual Preference		APS = Audio Preference		TPS = Tactile Preference	

Learning Styles Assessment

Read each statement and select the appropriate number response as it applies to you.

Often (3)

Sometimes (2)

Seldom/Never (1)

Visual Modality

- _____ I remember information better if I write it down.
- _____ Looking at the person helps keep me focused.
- _____ I need a quiet place to get my work done.
- _____ When I take a test, I can see the textbook page in my head.
- _____ I need to write down directions, not just take them verbally.
- _____ Music or background noise distracts my attention from the task at hand.
- _____ I don't always get the meaning of a joke.
- _____ I doodle and draw pictures on the margins of my notebook pages.
- _____ I have trouble following lectures.
- _____ I react very strongly to colors.
- _____ Total

Auditory Modality

- _____ My papers and notebooks always seem messy.
- _____ When I read, I need to use my index finger to track my place on the line.
- _____ I do not follow written directions well.
- _____ If I hear something, I will remember it.
- _____ Writing has always been difficult for me.
- _____ I often misread words from the text-(i.e., "them" for "then").
- _____ I would rather listen and learn than read and learn.
- _____ I'm not very good at interpreting an individual's body language.
- _____ Pages with small print or poor quality copies are difficult for me to read.
- _____ My eyes tire quickly, even though my vision check-up is always fine.
- _____ Total

Kinesthetic/Tactile Modality

- _____ I start a project before reading the directions.
- _____ I hate to sit at a desk for long periods of time.
- _____ I prefer first to see something done and then to do it myself.
- _____ I use the trial and error approach to problem-solving.
- _____ I like to read my textbook while riding an exercise bike.
- _____ I take frequent study breaks.
- _____ I have a difficult time giving step-by-step instructions.
- _____ I enjoy sports and do well at several different types of sports.
- _____ I use my hands when describing things.
- _____ I have to rewrite or type my class notes to reinforce the material.
- _____ Total

Total the score for each section. A score of 21 points or more in a modality indicates a strength in that area. The highest of the 3 scores indicates the most efficient method of information intake. The second highest score indicates the modality which boosts the primary strength. For example, a score of 23 in visual modality indicates a strong visual learner. Such a learner benefits from the text, from filmstrips, charts, graphs, etc. If the second highest score is auditory, then the individual would benefit from audio tapes, lectures, etc. If you are strong kinesthetically, then taking notes and rewriting class notes will reinforce information.

APPENDIX G

LEARNING (STUDENT CONFIDENCE) SURVEY- DATA ANALYSIS

Appendix G

Learning (Student Confidence) Survey- Data Analysis

LEARNING (STUDENT CONFIDENCE) SURVEY – DATA ANALYSIS

1. I enjoy science class.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	0	1	5	4
Three	1	5	7	2
TOTAL =	1	6	12	6

2. Outside of assigned practice, I study at home to help increase my understanding of the learning targets in science.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	1	3	6	0
Three	6	7	2	0
TOTAL =	7	10	8	0

3. The methods my teachers use to grade are consistent with each other.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	0	1	5	4
Three	1	2	9	3
TOTAL =	1	3	14	7

4. Science is one of my stronger subject areas; I do well in science.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	0	1	5	4
Three	0	6	5	4
TOTAL =	0	7	10	8

5. I visit my science teacher outside of class hours (*e.g., lunch, before/after school, etc.*) to get help, retake assessments, or show an improvement in my learning through self-generated assessments.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	1	5	2	1
Three	5	8	1	1
TOTAL =	6	13	3	2

*One student didn't fill in a level of confidence for item.

6. My parents/guardians ask to see and discuss my report card with me.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	2	0	4	4
Three	0	3	3	9
TOTAL =	2	3	7	13

7. I pay close attention to feedback I get on practice work and assessments that are returned to me in order to see how I can improve my learning.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	1	1	5	3
Three	1	5	9	0
TOTAL =	2	6	14	3

8. I feel confident in my ability to improve and do well in science.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	1	0	5	4
Three	0	1	9	5
TOTAL =	1	1	14	9

9. The methods my teachers use to grade are fair and communicate to me what I “do & don’t” know.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	0	0	2	8
Three	1	1	8	5
TOTAL =	1	1	10	13

10. I refer to the learning targets and rubrics in order to ensure that my learning is on target.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	0	2	6	2
Three	1	5	5	2
TOTAL =	1	7	11	4

*Two students didn’t fill in a level of confidence for item.

11. Report cards in science help communicate what I “do & don’t” know.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	0	2	4	3
Three	0	6	9	0
TOTAL =	0	8	13	3

*One student didn’t fill in a level of confidence for item.

12. I look forward to getting, and sharing my report card in science.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	1	0	6	3
Three	3	3	6	3
TOTAL =	4	3	12	6

13. I refer to the learning target's corresponding rubric to help keep track of my learning as well as what I can do to improve my learning.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	0	3	5	2
Three	0	5	8	1
TOTAL =	0	8	13	3

*One student didn't fill in a level of confidence for item.

14. Science report cards help guide my learning; they inform me of the learning targets I need to practice and improve on.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	0	0	7	3
Three	1	3	8	2
TOTAL =	1	3	15	5

*One student didn't fill in a level of confidence for item.

15. I feel comfortable sharing my thinking in science class.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	0	1	3	6
Three	1	6	5	3
TOTAL =	1	7	8	9

16. Being given learning targets at the beginning of the week and going over them daily helps me learn.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	1	2	3	4
Three	2	5	7	1
TOTAL =	3	7	10	5

17. When I have learning targets I know what I should focus on learning.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	0	2	4	4
Three	1	0	10	4
TOTAL =	1	2	14	8

18. I do just as well without learning targets as I do with them.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	0	3	3	4
Three	0	4	4	5
TOTAL =	0	7	7	9

*Two students didn't fill in a level of confidence for item.

19. My other teachers use learning targets daily.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	2	2	5	1
Three	3	7	3	1
TOTAL =	5	9	8	2

*One student didn't fill in a level of confidence for item.

20. I prefer learning when my teacher gives us learning targets.

Period	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
One	2	1	4	3
Three	3	9	2	1
TOTAL =	5	10	6	4

APPENDIX H

IRB MEMBERS CURRICULUM COMPLETION REPORT

			%)
Research with Children - SBR	03/03/13	1/4	(25%)
Research in Public Elementary and Secondary	03/03/13	1/4	(25%)

Director, University of Miami
Director Office of Research Education
CITI Course Coordinator

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