

2016

Supporting the Intrinsically Motivated Learner

Alison Attura Loud

University of Maine at Farmington

Follow this and additional works at: https://scholarworks.umf.maine.edu/ed_leadership_projects

Part of the [Educational Leadership Commons](#)

Recommended Citation

Loud, Alison Attura, "Supporting the Intrinsically Motivated Learner" (2016). *M.S.Ed. in Educational Leadership Research Projects*. 36.
https://scholarworks.umf.maine.edu/ed_leadership_projects/36

This Research Project is brought to you for free and open access by the Graduate Works at Scholar Works. It has been accepted for inclusion in M.S.Ed. in Educational Leadership Research Projects by an authorized administrator of Scholar Works. For more information, please contact sotley@maine.edu.

Running Head: Supporting the Intrinsically Motivated Learner

Supporting the Intrinsically Motivated Learner

Alison Attura Loud
May 13, 2016

Supporting the Intrinsically Motivated Learner

Table of Contents

Abstract.....	p.3
Introduction.....	p.4
Literature Review.....	p.4
Summary.....	p.11
Conclusion.....	p.12
Research Proposal.....	p.14
Research Design.....	p.15
Research Methods.....	p.19
Research Narrative.....	p.23
Data Analysis and Interpretation of Findings.....	p.25
Conclusions and Implications.....	p.30
Recommendations.....	p.34
Personal Learning Reflection.....	p.34
References.....	p.37
Appendix.....	p.38

Supporting the Intrinsically Motivated Learner

Abstract

Intrinsic motivation is a key trait in students who are successful learners. This study analyzes the use of student-led goal setting and student choice with assessments in a 4th grade mathematics classroom, and how it effects student intrinsic motivation with regard to learning mathematics skills. The research was conducted using a mixed methods approach. Results found that the implemented strategies increased student intrinsic motivation in regards to meeting their goals and their ability to prove mastery of math standards. Recommendations are directed at classroom teachers to provide guidance in self goal setting and increase student autonomy in the classroom.

Supporting the Intrinsically Motivated Learner

Introduction

Student success would likely be considered a vital goal to any educator. But what makes a student successful? Of the many factors that play a role in a successful student's academic life, motivation has a clear connection to a student's interests, work ethic, and results on a given task. By breaking apart motivation into its various forms and finding what motivation and skills are necessary for student academic achievement, one can see which strategies should be used in the classroom to produce an intrinsically motivated learner in the classroom.

Motivation

If we are going to begin with the notion that motivation in conjunction with cognitive skill is necessary in order for a student to succeed in any educational setting, it is important to distinguish between the various forms and definitions of motivation. Motivation can be defined as simply the reasons for one's behavior. However, as you dive deeper into the idea of motivation in its various forms, one can see that there is quite a variety of motivation that can lead to different outcomes. According to Brooks and Young(2011), there is a spectrum of motivation that defines four main types: external, introjected, identified, and integrated. External motivation is comparable to extrinsic motivation, meaning the person is making decisions based on an external reward or to avoid punishment (Brooks & Young, 2011). Introjected motivation is acting to gain or avoid certain emotions such as guilt or pride, whereas identified motivation and integrated motivation are more closely tied to intrinsic motivation, or acting because of the value tied to the behavior or outcome, as well as addressing personal needs, interests, and behaviors

Supporting the Intrinsically Motivated Learner
(Brooks & Young, 2011). There is also the category of amotivation, or a lack of any motivation regardless of rewards or value.

Educators often are most interested in generating a desire to learn and grow within their students—in other words, for them to be intrinsically motivated to learn and challenge themselves. Unfortunately, many of the techniques used in traditional educational settings focuses on external rewards or punishments for actions taken and tasks performed. Because of this, it is important to look at the methods used to increase student intrinsic motivation in the educational setting. Linninbrink and Pintrich (2002) have defined four main families of motivation: self-efficacy, attributions, intrinsic motivation, and goal orientations. Understanding these concepts and applying techniques that will address them within the educational setting will play an integral role in creating intrinsically motivated lifelong learners (Linninbrink & Pintrich, 2002).

In order to create a sense of motivation there are certain important assumptions that should be made regarding motivation in order to successfully develop intrinsically motivated students according to the Social Cognitive Model of Motivation (Linninbrink & Pintrich, 2002). The first assumption is that motivation is dynamic (Linninbrink & Pintrich, 2002). This means that students cannot be placed into a category of ‘motivated’ or ‘not motivated,’ but rather they can be motivated in different ways and it is important to know why and how an individual is motivated (Linninbrink & Pintrich, 2002). A second assumption is that motivation can vary within a certain individual depending on subject, context, or situation (Linninbrink & Pintrich, 2002). This is especially valuable information because it means that the educator can have an effect on a student’s motivation by changing how information and skills are given or assessed.

Supporting the Intrinsically Motivated Learner

The third assumption is that a student's motivation (or lack of) cannot be determined by personal traits, demographic, or cultural differences (Linninbrink & Pintrich, 2002). Although any of those attributes may affect a certain individual's motivation, it cannot be assumed that it will for all others in the same category. What is more important is a student's belief regarding personal motivation and learning capabilities (Linninbrink & Pintrich, 2002). When these three assumptions of the Social Cognitive Model are made, educators can apply this knowledge to their own teaching and students, and create an environment that facilitates an intrinsically motivated group of students (Linninbrink & Pintrich, 2002).

Empowering the Learner

In order to advocate for the intrinsically motivated learner, one must understand the learner in his environment and what motivates him. Housing and Frymier (2009) discuss the perspective students often bring to the classroom, falling under two categories: grade oriented and learner oriented. The grade oriented learner is the student who is extrinsically motivated, or performing tasks to receive a certain grade, and sees classes as a "series of hurdles to overcome" (Housing & Frymier, p. 38, 2009). The learner oriented student is intrinsically motivated, views learning as valuable and rewarding, and often has less anxiety and greater academic performance (Housing & Frymier, 2009). Based on this, it would seem that an educator's goal would be to assist any students who fall under the grade oriented category to move into the learner oriented category. In order to do this, one must first look at why a student is not motivated or performing to their best ability.

Underperformance in school tends to be a red flag for lack of interest or motivation for a certain subject or task. Pipkin, Winters, and Diller (2007) have identified six variables involved

Supporting the Intrinsically Motivated Learner in underperformance: information, instruments, incentives, knowledge, capacity, and motives. Of special interest to educators specifically should be the information, knowledge, capacity, and motivation of the student. Information, knowledge, and capacity all force the educator to look at the underperforming student and ask certain questions: Was there a lack of instruction? Does the student really know how to do what it is they are being asked to do? Is this task at an appropriate level for the student? (Pipkin, et. al., 2007). These questions, along with the students' motivation, should also lead to some reflection on the teacher's part: Did I teach the task in a way that made sense and motivated the student? Did I provide an appropriate assessment? Did I provide appropriate feedback? (Pipkin, et. al., 2007) By reflecting on the assessment, the student, and the methods used to teach the student, one can begin to figure out what it is the student needs and how to give that to them (Pipkin, et. al., 2007). If an educator is able to accomplish this by using certain techniques and strategies, then the hope is that the student becomes an intrinsically motivated learner (Pipkin, et. al., 2007).

To begin creating a sense of intrinsic motivation toward learning, the student needs to feel a sense of empowerment and self-efficacy (Houser & Frymier, 2009; Schunk, 1983). Schunk (1983) describes self-efficacy as one's judgments of how well he/she can perform a specific task. Generally, students who have a higher sense of self-efficacy see benefits in schooling including interest, persistence in difficult tasks, positive behaviors, and higher academic achievement (Linnenbrink & Pintrich, 2002). When assessing a student's level of self-efficacy, one must be cautious regarding two aspects (Linnenbrink & Pintrich, 2002). The first is that self-efficacy is not the same as self-esteem, although it is possible that one can affect the other (Linnenbrink & Pintrich, 2002). The second caveat is that a student's sense of self-efficacy must be accurate

Supporting the Intrinsically Motivated Learner (Linnenbrink & Pintrich, 2002). If a student has an inaccurate sense of self-efficacy, believing they are capable of tasks that they are not ready for (for example), their opinions may change as they struggle through tasks which can result in loss of positive self-efficacy and motivation (Linnenbrink & Pintrich, 2002). It is the teacher's role to provide appropriate tasks and feedback to the student in order to create and maintain a positive, accurate sense of self-efficacy in a student (Linnenbrink & Pintrich, 2002).

It is clear that student motivation is effected by a combination of sense of self and capabilities, discovering student interests, assigning level appropriate tasks, and providing accurate, constructive feedback. These factors each play an integral role in creating and sustaining an intrinsic motivation to learn within a student. Essentially, we are attempting to create a certain type of learner, but the question becomes: What type of learner are we searching for?

According to Brak and Paton (2010), students who are more successful academically fall under a category they call Self Regulated Learners. A self regulated learner is one who is able to accomplish and adapt these three components throughout their schooling: managing strategies for cognition, management and control of effort on classroom academic tasks, and the cognitive strategies students use to learn and understand (Pintrich & DeGroot, 1990). Students develop these strategies through a combination of personal, behavioral, and environmental factors and experiences that are adjusting, modifying, and changing each time they are experienced (Brak & Paton, 2010). Brak and Paton (2010) also discuss the three phases of self regulation strategies that a self regulated learner would follow. The first phase includes strategies that set the stage for performance in learning, including setting goals, positive self-efficacy of the task, and having an

Supporting the Intrinsically Motivated Learner
intrinsic motivation to perform (Brak & Paton, 2010). The second phase is the performance of the skills and strategies necessary during the learning process, including monitoring of actions and time, use of strategies necessary for the task, and being able to ask for help when it's needed (Brak & Paton, 2010). The third phase occurs after the task is completed, and is a time for self-reflection (Brak & Paton, 2010). This phase, similar to one's self-efficacy, must be accurate in order to be valuable. One must reflect on own efforts made, strategies used, and be able to adjust what was done to better perform the task next time (Brak & Paton, 2010). A self regulated learner is someone who is constantly learning and growing from personal experiences, and who has a desire to continue to learn and challenge themselves.

Educator's Role

When discussing students and how or what constitutes an intrinsically motivated learner, it is clear that the teacher's role is vital in making and sustaining an interested, motivated, and enthusiastic learner. So what can an educator do to provide the right environment to support such a learner?

When Brooks and Young (2011) discuss a teacher's role in increasing motivation, they state the importance of having clear expectations in the classroom and with tasks, effective communication between teacher and student, and allowing for some autonomy within the classroom as long as the choice options are consistent. Linnenbrink and Pintrich (2002) emphasize the importance of providing opportunities for students to succeed on tasks that are at their ability level, and use those tasks to help them build new skills and knowledge. By setting goals based on their current abilities and allowing for various forms of tasks and assessments, students will have a more positive self-efficacy regarding schoolwork and enjoy the ability to

Supporting the Intrinsically Motivated Learner
choose how they are able to show their knowledge or abilities (Linnenbrink & Pintrich, 2002).

Teachers also must be able to provide appropriate and constructive feedback so that students are able to accurately assess their execution of a task, and can understand how or why they do well or poorly, which in turn can affect their sense of self-efficacy in the future, their expectations for themselves, and their behaviors toward school or specific tasks (Linnenbrink & Pintrich, 2002).

Cheung (2004) considers the use of goal setting as a means for promoting student autonomy, working at the students' ability level, and increasing motivation. He discusses the difference between learning goals (setting goals based on the desire to learn more) and performing goals (setting goals based on the desire to earn a title or grade), and how students tend to shift from learning to performance goals with age (Cheung, 2004). Teachers play an important role regarding goal setting in that they first need to teach students how to set goals for themselves, and assist in reinforcing their goals and working towards them (Cheung, 2004). However, in his results Cheung (2004) states that although goal setting does increase student motivation, it cannot accomplish this on its own.

A common thread in the research on teachers' roles with regard to increasing student motivation is the ability to know your students (Guthrie, Wigfield & VonSecker, 2000; Cheung, 2004; Linnenbrink & Pintrich, 2002). When teachers care about their students' welfare, are aware of the learning processes used and personal interests, and can accurately assess the point a student is at in their abilities, they are able to create a curriculum and learning environment where students want to be and feel successful (Guthrie et al, 2000). Students also often need to see the connection between what they are learning in school and what happens in real life. If the teacher is able to create real-world experiences that students can relate to, the level of interest

Supporting the Intrinsically Motivated Learner and motivation is much more likely to increase (Guthrie et al, 2000). What is also important to remember is that motivation varies depending on subject or task. Math teachers often find that students are less motivated or underperforming in their classes because of a lack of interest or self-efficacy regarding ability to do the tasks (Gottfried & Fleming, 2001). Gottfried and Fleming (2001) also question if a teacher's lack of interest or autonomy with a mathematics curriculum would reflect in their teaching or students' motivation for the class. If students are able to see a level of interest and enthusiasm from the teacher, relate the learning to their own interests and experiences, and are given choices in their tasks and assessments, that should increase their belief of ability to perform and their motivation to want to do so.

Summary

Throughout the spectrum of motivation there are two main categories it would fall under- extrinsic and intrinsic. Extrinsic motivation is when one makes decisions based on an external reward or punishment. Intrinsic motivation is when one acts based on personal values, beliefs, and needs. Students often fall under one of these two categories, also called grade or learner oriented students. Those who are extrinsically motivated (or grade oriented) try to do well on tasks because they want a certain grade or want to avoid a certain grade. These students often have much more anxiety with regard to assessments and less faith in their abilities to accomplish tasks. Those who are intrinsically motivated (or learner oriented) attempt to do well in the interest of enjoying learning and wanting to challenge themselves. These students often have much less anxiety with regard to assessments and tasks, and a higher sense of self-efficacy.

There are assumptions about motivation that should be made in order to assist students in becoming intrinsically motivated: motivation varies depending on the individual, the

Supporting the Intrinsically Motivated Learner
environment, the task/subject; motivation is dynamic- it is important to know how and why a student is motivated or not; and lastly, that motivation cannot be categorized by a student's culture, demographic, or other personal traits.

In order for students to be intrinsically motivated to learn, they must have a sense of empowerment within themselves regarding their education and ability to perform tasks. This can be enhanced by teachers in many ways: Students must be working on tasks that are appropriate for their abilities, but still challenging enough to learn and grow from. Students must receive appropriate and relevant feedback focusing on effort and use of skills in order to understand how/why they do well/poorly on an assessment, and can therefore have a better understanding of their own self-efficacy with regard to that task and similar tasks in the future. Teachers must make sure they know their students as individuals so that they are able to teach using their personal interests, skills, learning styles, and help them set goals and choose assessments that are appropriate. When the learning is connected to a student's personal life and experiences, they are much more likely to be motivated to learn and do well.

Conclusion

Students who are intrinsically motivated to learn, challenge themselves, and perform well are more successful in academics than students who are not. Educators need to work toward creating an educational system where all students are intrinsically motivated learners. In order to do this, teachers must first know their students. By knowing their students and their strengths, teachers are then able to create a curriculum that centers around the students. By using real world situations and experiences, goal setting, autonomy, and providing accurate and appropriate feedback, teachers can mold students into motivated learners. What is necessary for this to

Supporting the Intrinsically Motivated Learner

happen is for teachers to understand that the skills necessary to be an intrinsically motivated learner must be taught to the student before they can perform, similar to any other skill. Teachers need to show students how to set goals based on their current abilities, what skills they need to perform a task, how to choose which skills to use, how to accurately assess their performance on a task when they are finished, and how to adapt their skills and results for the next task. It is also important to understand that a student's past experiences will likely affect their self-efficacy and motivation in the future, so support must begin at an early age. Our final goal as educators should be to create self-regulated learners who can adapt and grow throughout their school years. When students have reached college, most of their education is choice-based, so if we are able to teach students at a young age how to know themselves as a learner and choose what is right for them, they are much more likely to be successful as an adult.

The ideas and strategies discussed in this review tend to lead to the idea of having a more individualized program for each student. The theories of standards-based learning and/or Mass Customized Learning support these same ideas. By individualizing a student's education, do we create a self-regulated, motivated learner? Could these strategies work for students who although may be motivated in some subjects, are less so in others? Mathematics, for example, seems to often be the most challenging and least interesting subject to students for various reasons. Could the use of these strategies help students understand and even desire to work on math? Also one should consider the use of technology being used in the classroom today. These are the questions I am interested in researching.

Supporting the Intrinsically Motivated Learner

Research Proposal

Problem:

The traditional model of the education system lacks the ability to customize a student's education to their abilities, needs, and interests. Students, especially in the middle and high school years, are more extrinsically motivated to perform well in order to gain or avoid certain grades. Teaching strategies used need to assist in increasing student intrinsic motivation in academics.

Purpose:

The purpose of the study was to examine if allowing more student autonomy in academics increases student intrinsic motivation. To do this, I implemented new teaching strategies in which students were able to choose an appropriate mathematics goal to work on and a form of assessment (also related to that topic) to use to demonstrate understanding and prove mastery of a standard. I created a peer-reviewed motivation assessment that was filled out by students at the beginning and end of the tested time period, interviewed a sample of students at the end of the study period, and kept a journal of teacher observations throughout the time of research.

Question:

Will the use of goal setting and student autonomy with assessment in a 4th grade mathematics classroom increase student intrinsic motivation?

Supporting the Intrinsically Motivated Learner

Significance of Study

In light of the recent move toward standards based learning and customizing students' education, this study will provide information regarding the ability to use student abilities, interests, and advocate for student decision-making, and determine whether these strategies will increase students' intrinsic motivation to learn. Because student intrinsic motivation regarding academics is connected to higher academic achievement, this study could in turn show how these teaching strategies result in increasing student intrinsic motivation and academic achievement.

Research Design

Purpose of Research:

Students who are intrinsically motivated to learn, challenge themselves, and perform well are more successful in academics than students who are not. In order to establish a classroom culture of intrinsically motivated learners, research has found methods that contribute to increasing student intrinsic motivation: using real world situations and experiences, goal setting, autonomy, and providing accurate and appropriate feedback, teachers can mold students into motivated learners. Research has also found that these methods, when used individually do not correlate to increasing student intrinsic motivation. This research study will investigate the use of individual student goal setting on mathematics skills along with student choice in assessments to prove mastery on those mathematics skills, and how the combination of goal setting and assessment choice contribute to student motivation in learning mathematics. This research will benefit classroom teachers in understanding how the use of goal setting and student autonomy may help increase student motivation in the classroom. By examining the use of student-driven goal setting and choice in assessment for mathematics and its possible impact on student intrinsic

Supporting the Intrinsically Motivated Learner
motivation in mathematics, classroom teachers could increase student involvement in their mathematics classrooms with regard to goal setting and assessment to increase students' intrinsic motivation, thus providing a climate of learner-oriented students in a math classroom setting.

Research Question:

My research question is designed to apply theories and observations previously made with regard to student intrinsic motivation, and assess their impact on student motivation in a mathematics classroom. Research has shown that the use of appropriate goal setting and the incorporation of student autonomy have both contributed to student intrinsic motivation. This study is pairing the use of student autonomy with regard to assessment and goal setting to assess potential impact on student intrinsic motivation. It is predicting that the pairing of goal setting and student autonomy in a math classroom setting will increase student intrinsic motivation and self-efficacy with regard to learning mathematics. This study used a combination of quantitative and qualitative data including student interviews and surveys at the beginning and end of the study period to assess and compare student intrinsic motivation with regard to mathematics. Student input regarding their motivation (surveys) and preference (interviews) when it comes to goal setting and assessment tasks in math were necessary to assess the impact the use of both strategies may have. Through answering my research question, a possible correlation may be found that the use of student goal setting and autonomy will increase students' intrinsic motivation in math, and can thus be incorporated into the math classroom setting by classroom teachers.

Core Concepts:

Student motivation can be characterized into two main categories: intrinsic and extrinsic

Supporting the Intrinsically Motivated Learner

motivation. Students who are generally motivated extrinsically are performing in academics based on external impacts (earning certain grades, parent expectations, rewards), and often struggle when faced with challenges and low sense of self-efficacy. Students who are intrinsically motivated are performing for the purpose of learning new material and improving oneself. Intrinsically motivated students typically have a higher sense of self-efficacy, ability to continue performing when faced with challenges, and decreased anxiety with regard to academics. Previous research has shown that the incorporation of real world situations and experiences, goal setting, student autonomy, and providing accurate and appropriate feedback in the classroom have contributed to increasing student intrinsic motivation and self-efficacy. Research has also shown that these strategies, when used individually, may not impact student motivation. There is little research that has chosen specific strategies or pairs of strategies to assess their impact specifically on student motivation, especially in the subject of mathematics specifically. I agree with the research in that the strategies named above may all contribute to increasing student motivation. However, classroom teachers need specific practices they can incorporate into their classrooms immediately. This study is designed to predict the implementation of two specific practices in the classroom setting and their impact on student intrinsic motivation.

Approach and Methods:

For this study, I guided students through the process of self goal-setting with regard to mathematics skills. I also provided students with 3 assessment choices for proving mastery of a math standard. Assessment choices included a traditional paper and pencil test, a technology based assessment, and a more hands-on assessment (for example: student creates a video explaining and

Supporting the Intrinsically Motivated Learner
providing examples of how to solve a long division problem). All forms of assessment were correlated to the common core standards, and required students to meet the same standards regardless of assessment type. I provided students with a short anonymous survey to be filled out at the beginning and end of the investigation. I also pulled a random group of students to interview at the end of the investigation period. Throughout the study, I kept a journal to record observations regarding student behavior and motivation. Aside from the goal setting and assessment choice, all other aspects of the math class remained the same as before.

This approach to investigating my research question is similar to previous research for this topic in that it includes researcher observations and student surveys and interviews for data collection. It is different in that it is testing specific teaching practices and their direct impact on student intrinsic motivation. This research approach is using practices that are appropriate for the subjects involved, and will allow for insight through the student surveys and interviews of student motivation and opinion with regard to the practices being assessed. Weaknesses that were taken into consideration are the reliance upon students to be honest and thoughtful in their responses both on the surveys and in the interviews. This weakness was attempted to be addressed through the use of anonymous interviews, in hopes students will feel more comfortable with providing honest responses. The interviews were with the researcher (classroom teacher) who has established a relationship with the students. This will hopefully provide students with a sense of trust and comfort in the interview setting. A second weakness is that this study will be done in a single classroom with 20 students, which limits the amount of data that can be collected.

In this study my research methods included quantitative and qualitative data. I collected quantitative data by conducting a longitudinal survey using a panel of the same students, assessing

Supporting the Intrinsically Motivated Learner
their motivation and self-efficacy in mathematics at the beginning and end of the study. I collected qualitative data through open-ended student interviews and an observation journal. These methods were chosen because they are allowing for reflection and insight from the subjects themselves, as well as objective observations of student behavior in the classroom during math. The data collected answered my research question through observing any correlation between the change in classroom practices and any change in student motivation throughout the study period. This method of research attempted to improve current research through its assessment of specific classroom practices and their impact on student motivation in a mathematics classroom setting.

Research Methods

Setting and Participants:

The data for this study was collected in a fourth grade classroom at Rangeley Lakes Regional School. I am the classroom teacher for this class and adjusted my current mathematics teaching practices for the purpose of this study. This study used grade-level appropriate teaching practices and assessed the motivation of students in the mathematics class. The participants for the investigation were 20 fourth grade students (the entire class). Parents of participants were notified and provided consent before any research was conducted (see Appendix F). The teaching practices involved in the study were used during the math class period and involved all students. The surveys were conducted altogether with the entire fourth grade class; interviews were conducted one-on-one during the school day. All students were involved equally in the use of teaching practices and assessments, removing any possible bias.

Methodology & Operational Measures:

For this study I chose three methods for retrieving data on student motivation, both qualitative

Supporting the Intrinsically Motivated Learner
and quantitative. The quantitative data was collected through a longitudinal student survey given at the beginning and end of the study period. The qualitative data was collected in two ways: ongoing observations made by myself during math class throughout the study period, and interviews conducted with myself and a sampling of students at the end of the study period. I chose to use these methods to collect data because motivation is something that can be both felt (in this case, by the students themselves) and observed, thus student input is necessary when looking for any changes in motivation. I created the survey and interview questions myself to make sure all concepts are included. The benefits to using this form of data collection are that they reflect daily observations and possible changes in student behavior in the classroom, and they allow students opportunity to express personal opinion regarding their attitudes, motivations, and self-efficacy toward mathematics. The possible drawbacks for this type of data collection include relying on students to honestly answer the questions to their surveys and interviews. The anonymity of the surveys hopes to address any concerns students may have with providing honest answers.

The questions for both the student interview and survey were carefully selected based on characteristics researchers have included in the definition of motivation. These characteristics include: high and accurate sense of self-efficacy, on-task behavior, goal-setting, completion of ability appropriate tasks, and working toward a goal of learning for the sake of improving oneself, and not for an external reason (i.e. intrinsically motivated to learn versus extrinsically). These traits are also the focal point for my observations during the study period. By focusing my questions and observations on these traits, my data collection will be able to show any changes or patterns in student intrinsic motivation during a period of time when goal-setting and assessment choice are used.

Supporting the Intrinsically Motivated Learner

Data Collection, Analysis & Expected Findings:

Data collection was done in three ways, both qualitative and quantitative. The quantitative data was a longitudinal survey given to students at the beginning and end of the study period. Students completed this survey anonymously during the math class period together. Qualitative data will be collected in two ways. First, a sampling of students from the fourth grade class were randomly selected to conduct a brief interview with the researcher at the end of the study period. The students' names were not recorded on the interview. The second piece of qualitative data collected was an observation journal used by the researcher throughout the study period. Observations were made strictly during the math class period and were observations of student behaviors during the math period. All participants received the changed instructional practices at the same time as a whole group to ensure equal and equitable treatment.

The survey used was created for the purpose of this study. It is written in age-appropriate language to ensure accurate responses from the subjects. The interview questions were also written for the purpose of this study, and were written in age-appropriate language to ensure student understanding and accurate responses. All of these materials were anonymous and kept by the researcher in a locked space for the duration of the research period.

When the data collection was complete, survey data was averaged for each survey statement. The pre and post survey data (averages) were compared using descriptive statistical analysis to identify any changes or trends in scores. The student interviews were transcribed and coded as numbers (student #1, #2, etc.). The data from both the interviews and researcher observations was analyzed through a narrative discussion.

The expected findings for this study were an increase in student intrinsic motivation with

Supporting the Intrinsically Motivated Learner
regard to math class due to the implementation of student-led goal setting and student choice in student assessments used to prove mastery of a skill. The initial survey was provided to students to be used as a comparison to the final survey (same questions) given at the end of the study period. The trends in the student surveys as well as the teacher observations were expected to show an increase in student on-task behavior, increased self-efficacy with regard to mathematics, and an internal desire to learn new material. The student interviews conducted provided students with an opportunity to reflect on their habits and motivations with regard to math, and were expected to express that the use of setting their own goals and choosing their own method for assessments will intrinsically motivate them to learn the material and prove proficiency on a skill.

Potential Issues & Weaknesses:

The largest potential barrier in this study was the data collection on a concept that can be difficult to “see” (i.e. motivation). For this reason, I have included multiple forms of data collection including my own classroom observations, student surveys to be completed at the beginning and end of the study period, and a student interview done with a sampling of students from the class. Through using these various forms of data collection, I have attempted to gather enough data to show any trends or changes in student behavior and motivation within the math classroom.

A second potential barrier in this study was the reliance on student input for data collection. The surveys and interviews were conducted with the assumption that students will provide honest answers to be analyzed. The student surveys were anonymous to provide students a sense of safety with regard to giving honest opinions. The interviews were conducted one-on-one with a student and myself, and the relationships we have established by the time the

Supporting the Intrinsically Motivated Learner
interviews were conducted was beneficial with regard to students feeling safe to answer questions honestly.

Research Narrative

Throughout my teaching experience I have worked with students in various grade levels and among various departments including Special Education and ESL. While working with these students, I often noticed that a significant challenge many students faced was their feeling of success with regard to difficult content, standards, or tasks. Now currently working as a fourth grade teacher, I found that students in my class often struggled with the math that I was required to teach, and often would shut down if they didn't think they were going to do well on an assessment. Behaviors I would observe when students struggled and shut down included avoidance, distraction (of self and others), crying, anger, refusal to work, or attempting to get answers from classmates. As a teacher, it's heartbreaking to see a student react in this way to a lesson, task, or activity that you are hoping they would learn from and enjoy- when in fact, the opposite is happening. As the demands on teachers becomes greater, and the expectations we are putting on students becomes greater, we begin to see these reactions and wonder if this is really what's best for the students.

This led me to my beginning research for this study, wherein I looked into the teaching strategies previously proven to help facilitate a classroom of intrinsically motivated students. Among the research I found, various strategies were discussed as ways to contribute to supporting an intrinsically motivated learner, however there has not been any concrete evidence proven if you use 'this' strategy, you will see an intrinsically motivated student or class. Strategies that were proven to contribute, however, included teachers establishing relationships

Supporting the Intrinsically Motivated Learner and understanding their students, goal-setting, providing constructive feedback, student autonomy, and the use of real-world scenarios in the learning process. I decided to take two strategies suggested in my research and apply them to my own classroom in the area of mathematics: goal setting and student autonomy with assessments. I chose these two strategies because I felt that they applied well to my professional goals in my career, my philosophies as a teacher, and the way that I structured my math class. This is not to say I didn't use other strategies previously mentioned, however the goal setting and student autonomy were the two I wanted to explicitly research for the purpose of this study. I then decided on my means for data collection, which were mostly qualitative including student interviews and teacher observations. I did include a survey in an attempt to gain some quantitative results with regard to students' opinions, but the idea of quantifying motivation seemed a bit counterintuitive in some ways.

When the research period began, I first discussed with my class the changes we would be making for a period of time. I told them they would be helping me conduct research for my masters class, and they were actually excited to try the change and help me with my study. I did not tell students the outcome I was hoping to find to avoid any bias on the students' opinions or the data. For the first two weeks, I guided students through the process of self goal-setting (previously my students were given a class goal for the day) and slowly relinquished the teacher input until I was confident they could do it independently. Students were then required to set a daily goal for themselves in math class. At the same time, I provided students with choices in the assessments they used to prove mastery of a standard when they felt ready. Those assessment choices included our traditional paper and pencil test, a technology based assessment, or a student-created assessment (students were required to meet with me to discuss their plan before

Supporting the Intrinsically Motivated Learner
doing the third option). This continued throughout the entire research period (approximately 2.5 months). I did show the students some examples for the third option so that they had an idea of what I meant by ‘student-created’ assessment. The examples included student-made video lessons, a small booklet of geometry definitions and examples, and a poster explaining the steps to long division using examples. Regardless of the assessment choice a student made, I was sure to include guidelines for each to ensure that all students were being assessed on the same standards, and covered enough examples to truly show mastery.

My data collection was both ongoing and summative for this research study. At the very beginning of the research period I gave students an anonymous survey (see Appendix A), which they also filled out at the very end of the period. I kept a journal where I recorded observations, conversations, etc. throughout the study. These observations included the types of assessments being chosen by students. Lastly, I conducted six interviews with students chosen at random at the end of the study period (see Appendix B). Once I had all of my information, I compiled all of my data and began noting connections, themes, trends, and discrepancies I came across. The results I found were on track with my predicted results, however there were some aspects that differed from what I expected to find.

Data Analysis & Interpretation of Findings

Three separate forms of data collection were utilized during the research period. Each of these forms yielded similar results with a few major themes realized, as well as questions for further research.

The first form of data collection was a quantitative anonymous survey (see Appendix A) given to the entire 4th grade class (20 students) at the beginning and end of the research period.

Supporting the Intrinsically Motivated Learner

The students were given twelve statements they were to score on a 1 to 4 scale, 1 meaning strongly disagree and 4 meaning strongly agree. The scores for each statement pre and post research period were averaged and then compared to observe any changes and in what direction.

My immediate observation of the results (see Figure 1) when comparing pre and post scores noted the overall increase in each statement's score except for *Statement 5: I like to have my teacher set my goals for math*. Interestingly, *Statement 6: I like to set my own goals for math*, had the second highest increase in mean score from 2.35 to 3.16 (see Table 1). This would suggest that the change from teacher-led goal setting in the math class to student-led goal setting supported student intrinsic motivation in terms of self goal-setting to track one's progress toward and eventually mastery of a given math standard. In terms of assessment choice, *Statement 9: I enjoy showing what I've learned with my final assessments in math* had an increase in the mean of 0.29, suggesting students preferred the autonomy with assessment choice to prove mastery of a math skill.

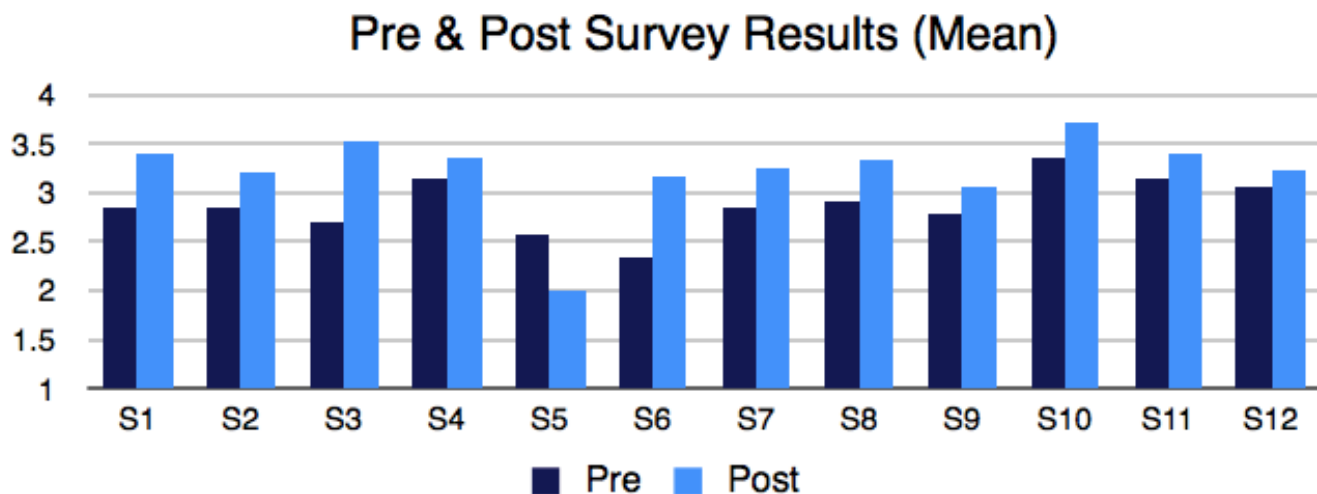


Figure 1 (Above): Mean Pre and Post Survey Results Comparison

Supporting the Intrinsically Motivated Learner

Table 1 (Right): Mean Pre and Post Survey Scores

Statement #	Mean Score (Pre)	Mean Score (Post)
1	2.85	3.40
2	2.85	3.20
3	2.71	3.53
4	3.14	3.36
5	2.57	2.00
6	2.35	3.16
7	2.85	3.26
8	2.92	3.33
9	2.78	3.07
10	3.36	3.73
11	3.14	3.40
12	3.07	3.24

The largest increase in mean score from pre to post survey was shown in *Statement 3: I look forward to math class each day*, which increased by 0.82, implying students became more excited about and intrinsically motivated toward their math class. However, when looking at the statements that decipher between a student being intrinsically or extrinsically motivated to do well, both Statement 10 (extrinsic) and Statement 11 (intrinsic) mean scores increased from pre to post research period, with Statement 10 increasing by 0.37, and Statement 11 increasing by 0.26. This data shows an increase in both the students' intrinsic and extrinsic motivation toward

Supporting the Intrinsically Motivated Learner
doing well in math class, with a larger increase in their extrinsic motivation.

The second form of data collection was a qualitative approach using the teacher/researcher's observations of day-to-day behaviors of the students during math class. Over time, there were some changes among the students being observed with regard to their approach in learning new material. Many students used their daily math goal to keep them focused during math class. Often students would come up to the teacher and express their excitement over already meeting their goal for the day and now moving on to complete an extra assignment or task. This was clear evidence to me as their teacher and researcher that the strategy is contributing to their motivation toward meeting math goals.

While recording the types of assessments chosen throughout the research period, a trend developed in the use of the technology-based assessment choice. A majority of student assessments completed during the research period were technology based, with the paper-and-pencil test being the second most frequent choice. One conversation with a student regarding the third option (student-created assessment) was interesting in that the student began the process (he was going to use an app to create a video explaining how to solve certain math problems), but decided against it and chose the paper-and-pencil test simply because of the amount of time it would take to complete. Two other students did complete their own form of an assessment, using the app the previously mentioned student was using, and both expressed enjoying the process and method for showing mastery of a skill.

Near the end of the research period, the students as a class questioned whether the option to choose their assessment would continue after the study period was over, stating they would prefer to continue having a choice for the rest of the school year. This is a strong indication of

Supporting the Intrinsically Motivated Learner
the effect student autonomy with regard to assessments in math had on the students.

The final data collection method was a teacher-student interview done with a sampling of students chosen at random from the 4th grade class (see Appendix B). The interview provided an opportunity to get more information out of the students regarding their opinions regarding the change in math class, and their reasons behind those opinions. One interesting theme among students was their answer to *Question 4: Do you work toward your math goals? Do you do it because you have to or because you enjoy learning new skills?* Every student interviewed responded that they do work toward their daily goals, and that they did it because they enjoyed learning a new skill. This would suggest students were more intrinsically motivated to learn their math skills and standards, which contradicts the survey results where the extrinsic motivator scored higher.

Other trends in the interview data showed students preferred having choice in the types of assessments they used to show mastery of a skill, often because they found that a certain form of assessment was a more comfortable way for them to show what they've learned. When asked if their feelings toward math have changed (Question 5), Student 3 responded: "Yes. I like the choice because it helps you better so you can try multiple things. So you don't have to do only one thing at a time or one type of test. Sometimes the paper tests make me nervous that I won't do well, so I like to use the IXL test instead." This supports the understanding I had before beginning the research that some students are not comfortable, or even become stressed by the idea of having to take a test to 'prove' you know how to do something, thus possibly giving the teacher inaccurate results with regard to a student's ability.

The purpose of this research was to create a specific combination of various strategies that

Supporting the Intrinsically Motivated Learner have been previously researched as methods to increase student intrinsic motivation. Among the strategies previously researched were goal setting, student autonomy, creating real-world scenarios, providing appropriate feedback, and understanding your students' strengths and needs. Research in this field also showed that teachers must first understand how to teach their students the skills needed to become a self-directed, intrinsically motivated learner.

According to my research, this is the first study to combine specifically student-led goal setting and student choice in assessments to increase student intrinsic motivation toward learning math skills. The research period began with the teacher guiding students through the goal setting process until they were able to effectively set their own goals. The teacher also provided examples for students with regard to the various forms of assessments they were able to choose from, so that the students fully understood what to expect when choosing an assessment for proving mastery.

Although the results did point in the direction of students becoming more intrinsically motivated with the implementation of these strategies in the classroom, the study period length and the sample size are too small to be generalized to a definite conclusion. It certainly has set the foundation for further research in this area, with the specific combination of student-led goal setting and student autonomy with regard to assessment for proving mastery to foster intrinsically motivated students.

Conclusions & Implications

When compiling all of the data collected, there are three main trends that have emerged from the research. The first is that student-led goal setting supports students tracking their progress on a standard and motivates them to stay on track. This was shown through the survey

Supporting the Intrinsically Motivated Learner
results in the increase of mean scores for Statements 4, 6, 7, 8, 10 and 11. The large mean increase in Statement 6 also demonstrated that student-led goal setting leads to higher motivation among students when compared to teacher-led goals. Student interviews also suggested most students prefer setting their own goals because it motivates them to meet their goal for the day, and helps them stay on track for what they need to accomplish.

The second theme that emerged from the data results was the connection between student choice in final assessments allowing for students to prove mastery of a standard in a way they feel they'll most succeed, which in turn leads them to feeling more motivated toward proving mastery of a skill in math class. In the survey results, Statement 9 had a mean increase of 0.29, suggesting students preferred the change in providing choice for ways to show mastery of a skill. Teacher observations of the math class throughout the research period also supported the increase in student motivation when it came to assessment choice. The whole-class discussion when students requested the option continue was a clear indicator of their preference for autonomy in aspects of their learning- in this case, math assessments. Student interviews also presented support in this conclusion when all interviewed students stated they enjoyed having choice (Question 3) for various reasons including being more comfortable with certain forms of assessment, enjoying using a variety of ways to show mastery, and becoming more aware of when he or she is actually ready to prove mastery.

One observation that is important to note, however, emerges from both the teacher observations and the interview with Student 4. Certain students, all of whom are students who are working ahead on skills compared to the rest of their class, were more motivated by extrinsic factors including using the assessment that was easiest and/or fastest, and those students are also

Supporting the Intrinsically Motivated Learner
the ones who did not notice any change in their feelings toward math since the research had begun. These are students who already consider themselves to be successful math students, and seem to view what they accomplish in math class as more of a ‘means to an end’ than a learning experience. I found it was worthwhile to note the difference in students who previous to the study period often struggled with math compared to those who felt more successful.

The third conclusion I came to after analyzing the data was that students are more motivation to learn and meet math standards when given the combination of daily goals and choice in proving mastery of a math standard or skill. Initially my prediction had been that students would become more intrinsically motivated, however the data yielded results in both the favor of extrinsic and intrinsic motivators. The survey results were the largest piece of evidence pointing toward an increase in student motivation with a heavier focus on extrinsic motivation (Statement 10) versus intrinsic (Statement 11), although those statements focused primarily on meeting goals and proving mastery. However, when looking at the statements involving students’ feelings toward math, including Statements 1, 2, 3, and 12, those are all intrinsically motivated statements which increased from pre to post survey with Statement 3 resulting in the largest increase in mean score.

Furthermore, the student interviews all contradicted the survey Statement 10 results with their responses to Question 4 regarding the reason they meet their math goals. Every student interviewed responded that they meet their goals because they enjoy learning a new skill, not because they “have to” meet their goal. This further supports the idea that students became more intrinsically motivated to meet their math goals and master their math skills.

I find it important to note the age of the participants and the wording of the survey when

Supporting the Intrinsically Motivated Learner

determining the results, especially for survey Statements 10 and 11. Students in fourth grade are very influenced by the messages they receive from the adults in their lives. They often are under the understanding that getting ‘good grades’ is very important. That being said, had I reworded the survey and combined Statements 10 and 11 so that students had to choose between meeting goals to get good grades, or meeting goals because they enjoyed learning a new skill, perhaps I would have seen different results. For example, I may have written the statement as, “I try to meet my math goals because I want a good grade or because I enjoy showing what I’ve learned with my final assessments.” As mentioned in the interview results, all of the students interviewed stated they enjoyed meeting their goals for intrinsic reasons, which in some ways contradicts the results. It could also be understood that the use of goal setting and student autonomy with math assessments led students to receive higher scores on their assessments, which in turn caused them to feel more successful in math, and more intrinsically motivated to continue learning.

Determinately, this data leads to the understanding that although students may still be extrinsically motivated to get ‘good grades,’ they became more intrinsically motivated to start math class each day, to meet the goals they set out for themselves, to master and prove mastery of new skills in math, and therefore felt more successful as a math student.

Further research would be suggested to implement the use of student-led goal setting and student autonomy with assessments in math class with a larger population and a more varied population of students with regard to race, ethnicity, and socioeconomic status. The intrinsically motivated student is a challenge because our society is often driven by end results, hence the extrinsically motivated learner. It will take time for teachers to mold students into intrinsically motivated learners when their surroundings are influencing them with extrinsic factors.

Supporting the Intrinsically Motivated Learner

However, I believe using the strategies implemented here or a combination of strategies previously researched, it can be done.

Recommendations

Based on the results of this study, the first recommendation for teachers would be to implement a way for students to set their own daily or weekly goals in math class in order to help them track their own progress and stay on track to completing and mastering their standards. This needs to be a guided process in the beginning, with much modeling and guided practice until students exhibit the skills necessary to self goal-set. The second recommendation would be for teachers to provide various forms of assessment for students to prove mastery of a standard, and allow students to choose which type of assessment to they'll use. If the assessments are previously organized by the teacher, he/she can ensure that any assessments the students choose will still meet any expectations the teacher, school, or district has for students proving mastery. The assessment choices should vary in form, but not in content, in order to meet the needs of a diverse class but still assess on the same standard.

Personal Learning Reflection

My initial goal in performing this research study was to find a way to reach my students and help them feel successful. I was lucky in that I was able to conduct my research within my own classroom, because it allowed for me to really take in what I was observing with my students, while having the background knowledge necessary to notice any changes that may be happening. I had chosen the subject of mathematics because it was always an area I found students began to struggle in when they reached the fourth grade. Each year I'd see students who

Supporting the Intrinsically Motivated Learner
previously thought they were successful math students begin to hate the subject because they found it too challenging. Now some of that I believe is because of the expectations we are setting on our students today, but I also believe that some of it is due to the idea that previous to fourth grade, a lot of math came more easily to them, and fourth grade is the first year students are really challenged to think differently and more critically. This led me to wondering if the type of learner I had would influence how they felt about themselves as math students- would an intrinsically motivated student learn more and feel more successful than an extrinsically motivated one? And if so, can I turn an extrinsically motivated student into an intrinsically motivated one?

I had decided to begin my research on how to create intrinsically motivated learners, and chose from the strategies previously researched a combination of two that I thought would work well within my own classroom. I was a bit hesitant with regard to the forms of data collection I would be using as I initially thought of 'research' as being about the numbers, and here I was planning to use mostly qualitative data. Looking back now, I'm glad I did because it made it much easier to make connections to both my predictions of what I was going to see, what my data showed me, and what that really means in terms of my research, my classroom, and what the next steps could be.

I think my strongest piece of data was my personal observations. I knew my students and I immediately noticed when changes in their behavior and attitude toward math class was happening. The conversations I was beginning to have with students regarding their goal setting and meeting their goals, or the whole class conversation where the students requested that we continue to do what we've been doing for the research were truly valuable. This was really

Supporting the Intrinsically Motivated Learner

powerful to me because it showed that what I was doing was at least working for them, and that was my motivator for this study the entire time. If I could at least create an environment in my own classroom where students were excited to learn and motivated to challenge themselves, then this research project was worth it.

Analyzing my results was interesting in that I both did and didn't see what I was expecting. As I mentioned in my findings, the students seemed to have been more motivated in general- both intrinsically and extrinsically. Because my form of data collection was mostly qualitative, it leaves a lot of room for further questions or a desire to try again but with some tweaks here and there. That being said, I think that as far as learning how to conduct research and make sense of the results I really appreciated the process. It was interesting for me to look back at the survey results and compare both the pre and post scores, as well as the overall scores to what I found in my interviews and observations.

This experience has taught me that research is quite the opposite of black and white, and almost always leads to further research and questions. I really enjoyed the research process, and I think a large part of that is because I was trying something that could immediately effect my practice. In reality, teachers do this all of the time, just not as formally. We read about new ideas, take classes, go to conferences, and we try them out in our classrooms to see how it goes. The benefit I suppose of conducting an actual research study is the possibility of getting results worth sharing with others- which can then lead to those classes, conferences, and books or articles the other teachers read about. It is certainly a worthwhile practice and a process I enjoyed experiencing firsthand.

Supporting the Intrinsically Motivated Learner
References

- Brak, L. B. & Paton, V. O. (2010). Profiles in self-regulated learning in the online learning environment. *International Review of Research in Open and Distance Learning*, 11(1), 61-75.
- Brooks, C. F., & Young, S. L. (2011). Are choice-making opportunities needed in the classroom? Using self-determination theory to consider student motivation and learner empowerment. *International Journal of Teaching and Learning in Higher Education*, 23(1), 48-59.
- Cheung, E. (2004). Goal setting as a motivational tool in student's self-regulated learning. *Educational Research Quarterly*, 27(3), 3-9.
- Gottfried, A. E., Fleming, J. S., & Gottfried, A. W. (2001). Continuity of academic intrinsic motivation from childhood through late adolescence: A longitudinal study. *Journal of Educational Psychology*, 93(1), 3-13.
- Guthrie, J. T., Wigfield, A., & VonSecker, C. (2000). Effects of integrated instruction on motivation and strategy use in reading. *Journal of Educational Psychology*, 92(2), 331-41.
- Houser, M. L., & Frymier, A. B. (2009). The role of student characteristics and teacher behaviors in students' learner empowerment. *Communication Education*, 58(1), 35-53.
- Linnenbrink, E. A., & Pintrich, P. R. (2002). Motivation as an enabler for academic success. *School Psychology Review*, 31(3), 313-27.
- Pintrich, P. R., & De Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82(1), 33-40.
- Pipkin, C. S., Winters, S. M., & Diller, J. W. (2007). Effects of instruction, goals, and reinforcement on academic behavior: Assessing skill versus reinforcement deficits. *Journal of Early and Intensive Behavior Intervention*, 4(4), 648-657.
- Schunk, D. H. (1983). Ability versus effort attribution feedback: Differential effects on self-efficacy and achievement. *Journal of Educational Psychology*, 75(6), 848- 856.

Supporting the Intrinsically Motivated Learner
Appendix A: Student Survey

Math Survey

Read each statement, think about how you feel, and rate the statement from 1 to 4.

1 = Strongly Disagree

2 = Disagree

3 = Agree

4 = Strongly Agree

Statement		Rating			
1	I enjoy math class.	1	2	3	4
2	I feel like I'm successful in math class.	1	2	3	4
3	I look forward to math class each day.	1	2	3	4
4	I like to have goals to work toward in math.	1	2	3	4
5	I like to have my teacher set my goals for math.	1	2	3	4
6	I like to set my own goals for math.	1	2	3	4
7	Goal setting helps me stay on track in math class.	1	2	3	4
8	Goal setting motivates me to work hard in math class.	1	2	3	4
9	I enjoy showing what I've learned with my final assessments in math.	1	2	3	4
10	I try to meet my math goals because I want a good grade.	1	2	3	4
11	I try to meet my math goals because I enjoy learning new things and feel good about meeting them.	1	2	3	4
12	Learning math is fun!	1	2	3	4

Appendix B: Student Interview

Supporting the Intrinsically Motivated Learner
Interview Questions

Student # _____

- 1.) Do you enjoy math class? Why or why not?
- 2.) Do you prefer to set your own goals for math or for the teacher to? Why?
- 3.) Do you enjoy having a choice in the assessments you use at the end of a topic? Why or why not?
- 4.) Why do you work toward your math goals?
 - a. Do you do it because you have to or because you enjoy learning new skills?
- 5.) Do you think your feelings toward math have changed throughout this school year? If so, how?
- 6.) Do you feel successful as a math student? Why or why not?

Supporting the Intrinsically Motivated Learner
Interview with Student 1

Interviewer: Do you enjoy math class? Why or why not?

Student 1: Yes because it's fun.

Interviewer: What do we do that makes it more fun?

Student 1: Play games so we can learn more. I like to work at my own pace. It's also fun that I'm ahead of class pace so that I don't have to worry about falling behind.

Interviewer: Do you prefer to set your own goals for math or for the teacher to? Why?

Student 1: I probably would enjoy you choosing because sometimes I can't think of reasonable goals. Sometimes I just choose 'do math' or 'be quiet.'

Interviewer: Do you enjoy having a choice in the assessments you use at the end of a topic? Why or why not?

Student 1: Yes because sometimes the IXL is easier than the paper and pencil test, and sometimes the paper and pencil test is easier than the IXL.

Interviewer: So is it just about what's easiest?

Student 1: No, I just like having a choice between stuff so I don't have to focus on the focus and paper test, so if I wanna do it on a computer I can now.

Interviewer: Do you work toward your math goals?

Student 1: Yes, so I don't fall behind class pace and it's nice to have a math goal to work toward. So then, then you can just like see what you're looking for...see the light at the end of the tunnel.

Interviewer: Do you do it because you have to or because you enjoy learning new skills?

Student 1: I enjoy learning new skills, its also fun to like work toward your goal, because sometimes you get to play math games and it's just like awesome because games can be more fun. I also think math can be enjoyed more if you have games a lot. It's just that kids love games, and if we have more games then it'd be awesome.

Interviewer: How do the games tie into your math goals?

Student 1: Because it helps me practice, it helps a lot, really. It's like real fun because then you can have a fun side to math, and you also have the serious side. Because you can't always have everything that's a game, although it would be nice.

Interviewer: Do you think your feelings toward math have changed throughout this school year? If so, how?

Student 1: Yes, actually, because I am now looking forward to the end of the a test so I can choose between paper and pencil, I can show people my work on the screen on IXL, it's just real fun now.

Interviewer: Do you feel successful as a math student? Why or why not?

Student 1: Yes because I'm ahead of class pace. And also I love math.

Interviewer: Do you feel successful because of the skills you've learned as well?

Student 1: Yes.

Supporting the Intrinsically Motivated Learner

Interview with Student 2

Interviewer: Do you enjoy math class? Why or why not?

Student 2: I do enjoy math class because we get to learn new skills.

Interviewer: Do you prefer to set your own goals for math or for the teacher to? Why?

Student 2: You to.

Interviewer: Ok, and why?

Student 2: So you can just focus on one and don't go to the other one.

Interviewer: Do you enjoy having a choice in the assessments you use at the end of a topic?
Why or why not?

Student 2: Yes I do. Because sometimes a paper and pencil tests are hard and when you do the 'show me' it actually records your work so you don't have to check it all the time.

Interviewer: Any other reasons? Do you feel like there are certain ways that are easier for you to show your work?

Student 2: Yes I do. Umm doing the 'show me' and the IXL.

Interviewer: Do you work toward your math goals?

Student 2: Yes I do.

Interviewer: Do you do it because you have to or because you enjoy learning new skills?

Student 2: I enjoy learning new skills.

Interviewer: Do you think your feelings toward math have changed throughout this school year?
If so, how?

Student 2: No.

Interviewer: Do you feel successful as a math student? Why or why not?

Student 2: Yes I do. Because you have to learn new stuff and not all old stuff you already learned in different classes.

Supporting the Intrinsically Motivated Learner
Interview with Student 3

Interviewer: Do you enjoy math class? Why or why not?

Student 3: Yes. Because it helps you get smarter.

Interviewer: Do you prefer to set your own goals for math or for the teacher to? Why?

Student 3: My own goals. Because it helps me stay more on track so I don't too much things to do.

Interviewer: Do you enjoy having a choice in the assessments you use at the end of a topic? Why or why not?

Student 3: Yes so you don't have to do just only one thing you can try multiple things.

Interviewer: Do you feel like there are certain ways that are easier for you to show what you've learned?

Student 3: Yeah, doing IXL because it explains it better and you can tell if you're not ready to keep going, or need more practice, or something like that.

Interviewer: Do you work toward your math goals?

Yeah.

Interviewer: Do you do it because you have to or because you enjoy learning new skills?

Because I enjoy learning new skills.

Interviewer: Do you think your feelings toward math have changed throughout this school year? If so, how?

Student 3: Yes. I like the choice because it helps you better so you can try multiple things. So you don't have to do only one thing at a time or one type of test. Sometimes the paper tests make me nervous that I won't do well, so I like to use the IXL test instead.

Interviewer: Do you feel successful as a math student? Why or why not?

Student 3: Yes. Because I'm getting better at math because I've been focusing more on my skills.

Supporting the Intrinsically Motivated Learner

Interview with Student 4

Interviewer: Do you enjoy math class? Why or why not?

Student 4: Yes. I like it because it gives me a chance to learn things I didn't know before.

Interviewer: Do you prefer to set your own goals for math or for the teacher to? Why?

Student 4: I like setting my own because I know what I need to get done and I know what I can learn in a day.

Interviewer: Do you enjoy having a choice in the assessments you use at the end of a topic? Why or why not?

Student 4: Yes. Because if I didn't like something on the test that was on that test but it wasn't on a different test, I could take the other one.

Interviewer: Could you give me an example?

Student 4: So on Topic 13, those Try, Check and Revise were on the paper and pencil test, but they were not on IXL.

Interviewer: Do you feel like there are certain ways that are easier for you to show me what you know?

Student 4: No.

Interviewer: You tried two different ways, is there a reason?

Student 4: Different ones have different things that I like and that I don't like.

Interviewer: Do you work toward your math goals?

Student 4: Yeah I try to.

Interviewer: Do you do it because you have to or because you enjoy learning new skills? I enjoy trying to meet my goals.

Interviewer: Do you think your feelings toward math have changed throughout this school year? If so, how?

Student 4: No.

Interviewer: Do you feel successful as a math student? Why or why not?

Student 4: Yes because I don't care how far I am in the topic, I just know I can actually try to meet my goals and keep going. I want to learn as much of the fourth grade math as I can before the end of the year.

Supporting the Intrinsically Motivated Learner

Interview with Student 5

Interviewer: Do you enjoy math class? Why or why not?

Student 5: Yes because you get to learn more stuff about math.

Interviewer: Do you prefer to set your own goals for math or for the teacher to? Why?

Student 5: Teacher because then she can tell you that if you're not focused, she can tell you what your goal can be.

Interviewer: Does it help you stay focused?

Student 5: Yes

Interviewer: Do you enjoy having a choice in the assessments you use at the end of a topic? Why or why not?

Student 5: Yeah because it's easier on the computer than on paper.

Interviewer: Do you work toward your math goals?

Student 5: Yes.

Interviewer: Do you do it because you have to or because you enjoy learning new skills?

Student 5: Because I enjoy learning new skills.

Interviewer: Do you think your feelings toward math have changed throughout this school year? If so, how?

Student 5: Not so much, because it's like the same as before and I always liked math. Kind of though, because you can show the teacher if like you've been doing good or something in your math, like with your multiplication facts.

Interviewer: Do you feel like there are certain ways that are easier for you to show me what you've learned?

Student 5: Yes because you can do your math in your head sometimes, or sometimes I have to write it down. I like the regular test because it's easier on paper than computer sometimes.

Interviewer: Do you feel successful as a math student? Why or why not?

Student 5: Yes because when you complete something, you feel good after.

Supporting the Intrinsically Motivated Learner
Interview with Student 6:

Interviewer: Do you enjoy math class? Why or why not?

Student 6: Yes I do. I enjoy it because I get to learn new things and since we've been doing the math buddies it helps, and its just fun for me. I like the way we do our math.

Interviewer: Do you prefer to set your own goals for math or for the teacher to? Why?

Student 6: I like to set my own goals to see if I can do them so I can make a better math class for myself.

Interviewer: Do you enjoy having a choice in the assessments you use at the end of a topic? Why or why not?

Student 6: Yes because its a different way to learn different things, because I don't always want to do the same old paper and pencil test. I think it would be good to do different tests and try out new things and new ways for learning.

Interviewer: Do you work toward your math goals?

Student 6: Yes.

Interviewer: Do you do it because you have to or because you enjoy learning new skills?

Student 6: Because I enjoy learning a new skill.

Interviewer: Do you think your feelings toward math have changed throughout this school year? If so, how?

Student 6: Yes. Well, I didn't like math as much because it was really hard for me knowing I would have to do the same test and we'd have to do questions like this which was hard for me. But now I like my math more because I can pick my test and show my own work in my own way.

Interviewer: Do you feel successful as a math student? Why or why not?

Student 6: Yes I do. I feel successful as a math student since we've been doing these new types of tests and because I have such a great teacher to guide me.

Supporting the Intrinsically Motivated Learner
Appendix C: Student Goal Setting Sheet

Name: _____

My Weekly Math Goal

My Learning Target(s)!

My Plan:

Day	Goal	Accomplished?
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		

Supporting the Intrinsically Motivated Learner
Appendix D Letter to Superintendent

Informed consent for Superintendent

October 26, 2015

Dear Mr. McIntire,

As you are aware I am currently completing my graduate program at the University of Maine at Farmington for Educational Leadership. Upon approval I will be starting my research in January of 2016 and completing the project in May of 2016. I am very interested in the use of student goal setting and autonomy in the math classroom. My research question is: Can the use of student goal setting and autonomy with assessment increase student intrinsic motivation in mathematics?

In my research I will be observing motivation in children. I will guide students through the goal setting process and provide various choices for math assessments to prove mastery of math standards. I will be comparing student motivation in math when goals and assessments are chosen by the teacher, to student motivation when goals and assessments are chosen by the students.

All of my participants will not be identifiable. I have completed the National Institutes of Health (NIH) course on "Protecting Human Research Participants." I will store all data that is gathered in a locked file cabinet or on my password protected school issued computer.

If you have any questions please feel free to contact me. Thank you for considering my request to conduct research.

Sincerely,

Alison Attura 864-3311 ext. 147 aattura@rangeleyschool.org

I have reviewed Alison Attura's plan for researching the topic: Can goal setting and student autonomy with assessment increase student motivation? I give my consent to conduct this research from January of 2016 to May of 2016. I am aware that I can review the data and discuss the research project at any point during the research. I may also ask to view the report at the end of the study.

Date

Name

Position in district/site

Supporting the Intrinsically Motivated Learner

Appendix E Letter to Principal

Informed consent for Principal

October 26, 2015

Dear Mr. Brown,

As you are aware I am currently completing my graduate program at the University of Maine at Farmington for Educational Leadership. Upon approval I will be starting my research in January of 2016 and completing the project in May of 2016. I am very interested in the use of student goal setting and autonomy in the math classroom. My research question is: Can the use of student goal setting and autonomy with assessment increase student motivation in mathematics?

In my research I will be observing motivation in children. I will guide students through the goal setting process and provide various choices for math assessments to prove mastery of math standards. I will be comparing student motivation in math when goals and assessments are chosen by the teacher, to student motivation when goals and assessments are chosen by the students.

All of my participants will not be identifiable. I have completed the National Institutes of Health (NIH) course on “Protecting Human Research Participants.” I will store all data that is gathered in a locked file cabinet or on my password protected school issued computer.

If you have any questions please feel free to contact me. Thank you for considering my request to conduct research.

Sincerely,

Alison Attura 864-3311 ext. 147 aattura@rangeleyschool.org

I have reviewed Alison Attura’s plan for researching the topic: Can goal setting and student autonomy with assessment increase student motivation? I give my consent to conduct this research from January of 2016 to May of 2016. I am aware that I can review the data and discuss the research project at any point during the research. I may also ask to view the report at the end of the study.

Date

Name

Position in district/site

Supporting the Intrinsically Motivated Learner

Appendix F Letter to Parents

Informed Consent for Parents

Dear Parents,

I am currently enrolled at the University of Maine at Farmington as a graduate student. I am finishing up my Masters of Science in Educational Leadership. As part of my Capstone Project I will be conducting my own research. Your child is invited to participate in this research project that I will be conducting in the 4th grade classroom. The title of my study is, “Can the use of goal setting and student autonomy with assessment increase student motivation in mathematics?” Traditionally in the classroom students are provided goals to work toward and assessments to perform on that are decided by the teacher. In my study, I will be guiding students through the process of setting self-chosen weekly goals for the math skills they are working on. I will also be providing 3-4 assessment options for students to choose from when they have finished a math Topic. These choices will include the traditional paper and pencil test, a technology-based assessment, and a more hands-on form of assessment (for example: create a video describing how to solve a long division problem and providing multiple examples). All of the assessment choices will address the 4th grade mathematics standards students are expected to master by the end of the school year. Throughout the study, I will be observing student behavior with regard to motivation in the classroom during math class.

At the beginning and end of the study I will be providing students with an anonymous survey to fill out, asking questions about their opinion toward their ability and motivation in mathematics, and their opinion regarding the use of student choice with assessments. The survey will take approximately 5 minutes. All observations, surveys, and data from the students will be completely anonymous- no student names or personal information will be used.

The proposed study will happen in the regularly scheduled classes and is in line with the 4th grade curriculum. I will follow the regular schedule and will not change it. If you do consent

Supporting the Intrinsically Motivated Learner
to have your son or daughter's observations be part of this study, their identity will be completely confidential and their name or work will not be used in any context.

Benefits

This study may help to inform our practice, allowing us to modify as needed throughout the 4th grade school year.

Confidentiality

Your child's information is always kept with the highest level of confidentiality in the school, and this study will be no different. Your child's name will not be on any research notes or documents. To keep confidentiality, I will be coding the information, using numbers. Your child's name or other identifiable information will not be reported. All notes will be kept in a locked filing cabinet and/or on a password protected computer.

Voluntary

Participation is voluntary. This study is being done to improve practice and I want to reassure you that you and your son or daughter have no obligation to participate and nothing in their grade, status, or relation to the teacher, will be affected if they do not participate.

Contact Information

If you have any questions about this study, please contact me, Alison Attura, at aattura@rangeleyschool.org or by phone at 207- 864-3311 ext. 147. I am also available to meet face to face or in any other way in which you may feel is appropriate.

Attached is the consent form required for my study. Please indicate your participation preferences for you child below. I appreciate you taking the time to read this letter.

Sincerely,

Alison Attura

aattura@rangeleyschool.org 864-311 ext. 147

You may also contact Karol Maybury, the chair of the Institutional Review Board with any further questions:

Karol Maybury, Ph.D
Chair, Institutional Review Board
Univeristy of Maine at Farmington
karol.maybury@maine.edu
(207)778-7067

Supporting the Intrinsically Motivated Learner

I _____ have carefully reviewed and fully understand the purpose of research and the procedures to be followed. I understand that my child's records will be kept confidential, my child's participation is voluntary, and I may withdraw my child at any time without penalty. If I have any questions about my rights or my child's rights as a participant or the manner in which this research is conducted, I can contact the principal investigator, Alison Attura, at Rangeley Lakes Regional School (864-3311). I fully understand that actual names will not be used in any of the reported research.

_____ I grant permission for my child to participate in this study.

_____ I grant permission for photos and video recordings with the project, and understand that these photos along with any research data will only be used for an in class research project.

_____ I do not grant permission for photos associated with this project.

_____ I do not grant permission for video associated with the project.

Signature of parent or guardian

Date

You will receive a copy of this form by mail shortly after it is submitted.