The Impact of Student-Set Learning Goals on Third Grade Achievement in Mathematics

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A Special Project

Presented to

Dr. Gretta Merwin

Heritage University

In Partial Fulfillment

of the Requirement for the Degree of

Masters in Teaching and Learning

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2011

FACULTY APPROVAL

The Impact of Student-Set

Learning Goals on Third Grade Achievement

in Mathematics

Approved for the Faculty

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ABSTRACT

This project investigated whether there was a statistically significant correlation between goal-setting and student motivation in third graders with increased student achievement in the academic area of mathematics. Students began setting learning goals with the help of their teacher to see if this strategy had an impact on their motivation, effort, and ultimately greater achievement. Achievement was measured using the Measurement of Academic Progress test which was a computerized test that adjusted according to every correct or incorrect answer a student received. Results failed to show a significant correlation between student-set learning goals and student achievement. However, results suggested that goal setting may have increased student motivation resulting in a greater number of students increasing their overall achievement.

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Introduction

Background

The achievement gap had been growing wider in education, especially in the area of mathematics. On state tests such as the Measurement of Student Progress (MSP), students were asked to explain their thinking and reasoning and, in many cases, data showed they were having difficulty doing so (Nelson, Palonsky, & McCarthy, 2007). Educators pondered the following questions--were some students more right brained, leaving them to flounder in the mathematical world of analytical and logical thinking? Was the lack of parental involvement to blame or were teachers not really exhausting all of their resources? The essential question was what motivated children to learn and thirst for new knowledge so that they became academically successful. Since not all students were intrinsically motivated, setting goals could be the instructional tool that teachers could employ to reach all students and provide a custom education for each child, regardless of racial or ethnic background, socio-economic status, parental involvement, ability level, or any other hindrance. If teachers helped students set appropriate goals and increased their motivation to learn, this could be the answer to increased student performance.

The Problem

Elementary school students were not making the adequate gains in mathematics necessary to legitimately move up to the next grade (Office of Superintendant of Public

Instruction, 2010). However, students were still being promoted which potentially put students farther behind grade-level standards. A reason for this failure to make adequate gains could be that students were not motivated academically, and thus, were not able to increase their mathematical and computation skills. Therefore, students seemed to be falling and staying behind in the area of mathematics.

Purpose

The purpose of this project was to investigate whether there was a statistically significant correlation between goal-setting and student motivation in third graders with increased student achievement in the academic area of mathematics.

Delimitations

The specified parameters for this study were as follows: the study took place at a small elementary school in Washington State. The city itself had approximately 15,500 people. The elementary school was one of four in the farming community and had approximately 675 students, grades 1-5 (Sunnyside Chamber of Commerce, 2010). The demographic of the school was approximately 92% Hispanic with Caucasian, Native American, African American, and Asian making up the remaining eight percent. Two influential factors in the city were highly mobile families (following migrant work) and a history of gang violence. The focus area was a group of 22 third grade students consisting of 10 boys and 12 girls. All students were in a general education classroom and were not receiving any special education services. Approximately 98% of the test group was Hispanic and 2% were Caucasian. All (100%) students received free breakfast, lunch, and afternoon snack provided by the school (PowerSchool, 2010).

The achievement results were based on Measurement of Academic Progress (MAP) assessment data, which was a computer-based, adaptive test that was administered three times throughout the 2010-2011 school year (fall, winter, and spring). As an adaptive instrument, MAP adjusted accordingly to every correct or incorrect answer a student received---narrowing in on each student's specific strengths and weaknesses, allowing for a more clear focus of what the student should be working on in order to be proficient (Northwest Evaluation Association, 2010). Scores were measured by Rasch Unit (RIT) which was an equal-interval scale used to chart a student's academic growth from year to year (NWEA, 2010). Goals were not initially set and those scores were compared to the scores later in the year where a goal had been clearly established with the collaboration of the researcher and student. Students received approximately 20 minutes of direct instruction and the remaining 45 minutes were spent during small group, partner, and independent practice.

The teacher-guided curriculum was Investigations II which was adopted by the district in 2007 and used almost daily. In addition, there was a variety of supplemental resources added, based on state standards and used where classroom teachers felt Investigations II was lacking. Materials used were student workbooks, spiral notebooks, and dry-erase boards. In addition, formative assessments called "exit tasks" coupled with summative assessments were used to check for understanding as well as drive instruction to assist in adjusting goals as necessary. Mini-conferences, two to three minute, one-on-one conversations between teacher and students, took place every two to three weeks to check to see if students understood what they were working on, why, and how confident

they were in working toward the progress of their goal. Students were also given guidance on how to set an individual, appropriate learning goal. This information was recorded on their note cards.

Assumptions

According to the MAP data from the fall, approximately 85% of third graders in the test group were below grade level. Many of the students lacked confidence in their abilities, and it was likely that the students were unaware of how to set reasonably appropriate goals. The curriculum was inquiry-based and students could have been lacking appropriate background knowledge and vocabulary skills to comprehend specific lessons or activities. Instruction was adapted to meet the goals of each student with the aid of curriculum, supplemental work, cooperative grouping strategies, one-on-one work, and formative and summative assessments.

Hypothesis

Student-set learning goals increased student academic achievement in mathematics among third grade students as measured by the Measurement of Academic Progress (MAP).

Null Hypothesis

Student-set learning goals did not increase student academic performance in mathematics among third grade students as measured by the Measurement of Academic Progress (MAP).

Significance of the Project

The significance of this project was to demonstrate the effect of goal setting and

how it increased student motivation and, thus, influenced future achievement in mathematics. Students' increase in motivation could result in an increase in their performance in mathematics based on the MAP test. Positive results could produce an elevated level in performance. If results were not as predicted, and goal setting was not the answer, then continued research that supported student motivation to promote student achievement would be necessary.

Procedure

Prior to collecting student data, parents signed an informed consent permission form so that their student's scores could be used as data for this research. Parents were fully aware that data was collected and what the intentions of the study were. Informed consent was crucial in protecting the rights and confidentiality of the student and teacher. In the event that parents opted their child out, this could affect the number of students in the research sample, which could skew data results. Administration was also a part of the informed consent process in making sure the teacher was following all state guidelines and also acted as a liaison for teacher and parent. Secondly, students had a discussion on what they thought a goal was and why goals were important. Students then had time to set their own short and long term goals in their writing notebooks. During math time, students were given a questionnaire to inform the teacher of their feelings, attitudes, difficulties, and strengths that they believed they had in mathematics. This data was collected by the researcher and was used to compare confidence, (how capable a student felt in achieving a task, based on how strong a student felt his or her skills were) and achievement (an increased score) before and after goal setting.

Definition of Terms

do your best. Do your best was when teachers told their students to merely "do their best" without setting a goal or giving the students a clear idea of what they were trying to achieve.

external locus of control. External locus of control was a feeling that individuals had little control over in a given situation.

group goal set. Group goal set was when a small group was given a goal collectively.

individual goal set. Individual goal set was when an individual was responsible for setting and achieving his or her own goal.

Measurement of Academic Progress. Measurement of Academic Progress, also known as MAP, was an adaptive test used to measure student achievement in mathematics.

motivation. Motivation was the desire, interest or drive to complete a task.

peak performance. Peak performance was complete focus on performing a particular skill or task.

Rasch Scale. Rasch scale, also known as RIT, was the scale used to analyze data from the MAP assessment.

self-regulation. Self-regulation was when a person was metacognitively, motivationally, and behaviorally active in his or her own learning.

Acronyms

ACT. American College Test.

DYB. Do Your Best.

ELL. English-Language Learners.

GGS. Group Goal Set.

GGS + IGS. Group Goal Set and Individual Goal Set.

GPA. Grade Point Average.

MAP. Measurement of Academic Progress.

RIT. Rasch Scale.

CHAPTER 2

Review of Selected Literature

Introduction

Students were not making adequate gains in the area of mathematics (OSPI, 2010) but were still being promoted. This had put some students farther and farther behind each year. Since the cause of the lack of student achievement was unknown, several pieces of literature that supported student achievement were reviewed. The pieces of literature included works that supported student goal-setting, the motivation of students, and student performance. These were relevant to the research because, together, they had the potential to influence each other. For example, if students had had a clear goal or objective on what they needed to do to improve at something, then this could have increased their motivation, resulting in greater effort and, ultimately, higher achievement.

The following literature review explored three main themes: goal-setting, student motivation, and student performance. This study was broken up into these subtopics for the purpose of establishing a positive correlation between student goal-setting and motivation and its impact on student achievement. The purpose was to provide a clear understanding of how these three subtopics interacted directly to each other and the research topic.

Goal Setting

Goal setting in an elementary classroom was crucial to the learning and academic growth of students (Rader, 2005). However, goals were only effective if the person setting the goal had ownership of the goal and the drive to achieve it. Since not all

students were intrinsically motivated, teachers explicitly taught their students to set, stick with, and achieve goals.

Rader (2005) stated six steps for students to help them achieve their goals. Successful people always have had clear, focused goals that guided them to greatness. To develop this sense of control, ownership, and autonomy, students were given opportunities to learn the skills necessary to make sound choices, evaluate decisions, and solve problems. Rader asserted that students needed to not only be taught what a goal was but also the appropriate steps to take in order to achieve their goal. Rader also stated that students needed to first choose a specific goal and write it down. Upon doing this, students understood the different types of goals there were, for example, academic goals (improving in reading, math, writing, etc.), financial goals (saving money for something that they desired to obtain), physical goals (becoming a faster runner), and good-deed goals (mentoring another child). Students also needed to understand the difference between long term (over the course of the school year, or longer) and short term (weekly or monthly) goals. According to Rader, once students had a clear picture of long and short term goals, they could start a list of possible goals that they wanted to achieve. After they had this list, they set it aside and revisited the list again in a few days. This helped students narrow their ideas to goals that they felt passionate about, which created a sense of ownership (an idea that they had developed and now owned) for the student.

The second step, according to Rader (2005), was determining a specific time when the goal should be attained. In addition, students needed to be realistic during this process making sure that their time frame was not so soon that it was impossible, but not

so far away that they lost sight of what they were trying to achieve. Writing down the goal and when it should have been attained was a visual reminder for students that helped them remain focused.

Developing a plan of action helped students achieve their goal (Rader, 2005). That did not necessarily mean listing things that the students should do, but instead, generating a list of things that potentially threatened the achievement of their goal. The idea behind this was to make obstacles along the way less daunting to the student. This should then be followed up with a list of people who could help the student along the way, (i.e. family members, teachers, coaches, etc). The fourth step was having students visualize themselves achieving their goal. This process of creating a mental movie or picture was achieved by students drawing themselves achieving their goal or cutting pictures out of magazines to represent their achievement. The idea was that seeing was believing.

Rader's (2005) step five was reminding students that they must work hard and continue to work toward their goal. This step was more directed toward the teacher, in that he or she must give honest, positive, and prompt feedback to students to keep them feeling confident and motivated toward achieving their goal. This process was expected to help students feel successful along the way.

Finally, step six (Rader, 2005) was geared toward the students and their ability to self-evaluate their progress. "During this reflective process, students observe their actions, assess their progress, and propose alternative models to help them achieve their goals" (p. 125).

Rader (2005) suggested students showed greater performance when they set and monitored goals they had set themselves. Following the six-step process could help students set realistic, attainable goals and give them a sense of ownership in the process. This, in turn, could lead to greater effort which could positively affect student performance.

Wegge and Hasalam (2005) researched the effects of three group-setting strategies and how they improved work motivation and performance among collaborative groups or teams. In their study, the sample group was composed of 60 males and 60 females who were each in small groups of four, consisting of two males and two females. In addition, the sample groups were then divided into thirds consisting of 10 groups of four people each. Different goal-setting strategies were used with each set of teams. One test group had a do-your-best (DYB) approach, one had a group goal set (GGS) by an authority figure in a friendly and convincing approach to get the team to achieve a certain goal, and the last test group combined group goal setting (GGS) with individual goal setting (IGS). The goal was to see if there was any significance in the way the goals were set in correlation to group performance and motivation.

Teams were expected to work together on a brainstorming task. All groups were asked to participate in three different trials. Wegge and Hasalam (2005) set up their study as follows:

> Each trial lasted three minutes and presented a new problem. As a group, participants had to find and write down individually, as many different uses for common objects (e.g., a pocket lamp) as they could. Group members were

> informed that brainstorming typically seeks to produce as many different solutions to a problem as possible and that, therefore, the number of unique uses generated is the appropriate measure of team performance. After each trial, all group members were asked to read their ideas out loud. The experimenter counted the number of unique uses (e.g., so that ‘‘lighting a dark room’’ and ‘‘lighting a cellar’’ were counted as one idea) generated by all group members.
>
> (p. 409)

The experiment's results concluded that, overall, groups who had a goal set, GGS and GGS + IGS groups had an increase of +11 ideas more than the DYB group that did not have a specific goal set. The DYB group on average only produced +6 additional ideas to the brainstorming activity. There did not seem to be a significant difference in groups who had a group goal combined with individual group members having a personal goal. Wegge and Hasalam (2005) suggested that this was due to the simplicity of each task, i.e. groups were asked to produce 32 examples and therefore setting the individual goal of eight examples each did not have a significant impact on the group's final objective. This study supported the importance of goal setting and had found that having a common goal increased collaboration in teams, and enhanced communication, innovation, and the quality of decision-making in small group settings.

Russell and Phelps (2009) linked mastery-focused goal setting, locus of control, and underachievement as an implementation strategy to internalize locus of control and increase academic achievement. In this case, the authors defined external locus of control as, "a feeling that individuals have little control over in a given situation" (p. 4).

In most cases, underachievers were less likely to attribute higher performance to higher effort and attributed their failure to causes in which they had little or no control.

Russell and Phelps (2009) selected participants, chosen from set criteria of American College Test (ACT) scores, Grade Point Average (GPA) and/or individuals qualified as gifted during PK-12 grades, based on their responses to a questionnaire. Thirty students qualified to participate but only twenty-three completed all aspects of the study. All students met with the author, who instructed them on mastery-focused goal setting. These goals positively influenced individuals by increasing their drive to achieve which gave them a sense of direction and consequently increased their work production. Without goals, however, students put forth less work production because they had a low need for achievement. According to the author, the behaviors associated with performance avoidance may have included anxiety, defensiveness and an increased fear of failure for those students.

Overall, when a student felt in control over his or her academic environment, academic success increased (Russell & Phelps, 2009). In addition, most participants viewed goal setting positively with 85% of them stating that they planned to continue to set mastery-focused academic goals in the future.

Kitsantas, Steen and Huie (2009) connected performance with self regulating strategies and explained how they affected the goal orientation of elementary students. The researchers explained:

> Elementary students were split into two groups for analysis: primary (grades K-2, *n* = 192) and intermediate (grades 3-6, *n* = 202) and then rated by their homeroom teachers based on the different academic enablers examined. Findings showed that prior achievement influenced a string of variables including motivation and study skills, which in turn influenced academic achievement. (p. 66)

Findings were based on student grade point average (GPA) and standardized test scores which were cross-referenced with state standards to determine whether students were proficient or not.

For the purpose of this study, self-regulation was referred to as the degree to which students were metacognitively, motivationally, and behaviorally active participants in their own learning. This was distinguished between non self-regulated students because non self-regulated students set mastery oriented goals rather than performance goals. According to Kitsantas, Steen and Huie (2008) mastery goals focused on learning a task, improvement, and increased understanding whereas a performance goal focused on competence or ability and how it compared to the ability of others. The motivation behind both of these strategies appeared to be highly influenced by prior achievement experiences. In addition, students who were more goal oriented in the mastery of a specific area seemed to strive to gain a better understanding of a certain concept, compared to students who were more performance oriented who aimed to merely outperform their peers. Those students who worked hard to gain a broader knowledge base had more positive outcomes in comparison to those students who merely tried to

outperform their classmates, which were associated with negative outcomes (i.e. lower GPA and standardized test scores).

Kitsantas, Steen and Huie's findings (2008) showed that teaching elementary school students to adapt a mastery goal orientation and engage in self-regulation practice may be a crucial part to establishing a positive foundation for future academic development. This positive foundation enabled students to set their own goals which gave them ownerships and responsibility in determining the outcomes of their learning and achievement.

Student Motivation

"Student motivation was a significant part of goal setting" (Zimmerman, Bandura, & Martinez-Pons, 1992, p. 665). After students were able to appropriately set goals for themselves, their sense of ownership created an increased level of motivation.

Palmer and Wehmeyer (2003) suggested that "educators needed to teach students to become self-regulated problems solvers, set educational and learning goals, and to self-evaluate their performance toward the goal that they set" (p. 112). In this case, self-regulating differed from independent performance. "The model was a tool which was to be used by the student with modeling, support, and guidance from the teacher. It was not a tool that would miraculously create an independently motivated student" (p. 112). Palmer and Wehmeyer (2003) completed a study that consisted of fourteen teachers from two states, Texas and Kansas, who were recruited to implement the Self-Determined Learning Model of Instruction. This was a model that the teachers used to teach their students to become more self-regulated learners, in their homeroom classrooms. Students

were enrolled in grades kindergarten to third grade, in 11 elementary schools, across five districts. In addition, most students were receiving special education services in one or more academic areas. Students and teachers worked closely together with the aid of the model for approximately two months.

According to Palmer and Wehmeyer (2003) the model was set up in three phases and each phase had a series of questions that the student was expected to complete. Phase one was Setting a Goal. The student then solved the problem, "What is my goal?" by answering a series of questions developed by the researchers. "The questions are; what do I want to learn, what do I know about it now, what must change for me to learn what I don't know, and what can I do to make this happen?" (p. 115).

Phase two was Taking Action. The problem for the students to solve was, "What is my plan?" by answering, "what can I do to learn what I don't know, what could keep me from taking action, what can I do to remove these barriers, and when will I take action?" (p.115).

Phase three was Adjusting the Goal or plan. Students solved the problem, "What have I learned?" by answering, "what actions have I taken, what barriers have been removed, what has changed about what I don't know, and do I know what I want to know?" (p. 115).

Palmer and Wehmeyer (2003) found that, "the process of working through the model questions provides both students and teachers with a way to address needs, limitations, barriers to success, and accomplishments" (p. 125). Teachers also reported

that the majority of students met or exceeded their expectations, while very few students seemed to show little or no change in goal attainment based on the model.

According to Elliot and Thrash (2001), despite certain limitations, the achievement goal approach had made great headway in an "attempt to understand motivated behavior in achievement settings" (p. 143). The reason Elliot and Thrash focused on achievement goals specifically was because the focal point of this type of academic goal was competency as the main result. Since the individual had set their goal to become more competent in a specific area, the motivation for why the student wanted to achieve the goal was built into the goal itself. Referred to as cognitive goals, this created a representation that guided the student's behavior in a particular direction. This representation provided an aim for the student and also energized that direction, again, resulting in self-motivation.

The purpose of Elliot and Thrash's (2001) Hierarchical Model was to "explicitly and comprehensively account for both the energization and direction of competence-based behavior" and provide "greater conceptual flexibility" (p. 146) where the student was striving to approach success. However, the major implication with the model showed that, in some cases, students were motivated to reach their goal in order to avoid some sort of failure or dissatisfaction. With this said, it was hard to distinguish between students who were striving to do well versus those who were striving not to fail. Regardless, motivation was the driving force behind both behaviors.

Motivating students to be self-reflective learners through goal-setting and self-evaluation was not an easy task, especially in elementary school students. Goal setting

and self-evaluation were two skills that needed to be explicitly taught. Cunningham, Krull, Land, and Russel (2000) found that these skills were difficult for students to understand because of the following:

(1) students have a tendency to seek help instead of attempting a problem independently

(2) students are unable to explain their thinking and reasoning

(3) instead of learning from errors they view their mistakes as failures

(4) student give up or quit

(5) they rush through their work neglecting detail and quality

(6) when the work is not relevant to students, they lose interest. (p. 1)

In this study, the intervention of interest was a protocol that the teacher and student followed together. Students set a reasonable goal, reflected/monitored their own progress, received feedback from the teacher, and then had the opportunity to correct any mistakes and resubmitted the work. This protocol was followed in K-5 classrooms for all students in mathematics.

Overall, teachers reported that the interventions helped students identify specific strategies to gain desired knowledge and motivated them to take responsibility for their academic performance because they addressed the six barriers mentioned above. Overcoming these obstacles meant increased motivation and effort for most students.

Student Performance

In research completed by Adami-Bunyard, Gummow, and Milazzo-Licklider (1998) the objective of their case study was to increase academic achievement in

mathematics by improving student attitudes toward mathematics. The targeted groups were elementary students in kindergarten and third grade. Goal setting and mentoring were used to promote students' changes in attitude, to ultimately affect their overall performance. Students received a list of skills from the teacher that they needed to work on, and set their personal goals following the criteria given. Lessons were targeted toward the specific needs (goals) of students and assessment was used to determine performance. Daily reflections were made by all students in their journals and direct instruction made up the majority of instruction time which was approximately 40 minutes.

Before the research began, teachers developed a time for an intervention period. Twenty minutes a day, two times per week, for approximately two and a half months, sixth grade students were paired up with third grade students to work on their individual skills. The peer tutors were given an updated peer tutoring packet weekly. "These packets contained a goal sheet, instruction cards, manipulatives, stickers, certificates and a sheet for positive reinforcement phrases" (Adami-Bunyard, Gummow, & Milazzo-Licklider, 1998, p. 33). Overall, students were motivated, excited to learn, and anxious to meet again with their peer tutor and vise versa. During that time, results showed that the majority of students (82%) who were below grade level moved up within their grade level realm. A quarter (24%) of the students tested moved from at grade level to above grade level which showed the greatest difference was made for those students who started out below grade level. Overall, this strategy was beneficial for all involved, teachers,

peer tutors, and students who gained confidence in mathematics which was apparent in their performance.

Whitecotton (2007) drew the comparison between what drove student athletes to reach their peak performance and how teachers could bring that into the classroom. The author stated that "those who achieved peak performance were completely focused on performing a particular skill or task" (p. 36). The key to performance lay in the teacher's knowledge of the student's background or history in the subject. This provided a more personal connection to the goal for the student, and also helped the teacher provide support for achieving the goal. According to the author, the teacher was then able to increase or decrease the level of rigor for the students depending on what their needs were. When students had a clear focus on a particular task or goal, they were able to focus their energy on improving upon that goal. Whitecotton stated:

> Students should be asking themselves the following:
>
> (1) What do I want from school?
>
> (2) What am I doing to get what I want from school?
>
> (3) Is what I am doing working to help me get what I want?
>
> (4) What can I do differently? (p. 37)

These questions aided students in developing a behavior that was appropriate for the attainment of their goal. Thus, students achieved peak performance.

Self-Brown and Mathews (2003) stated the type of goal students set had a direct impact on their performance. Students who set performance goals were more concerned with impressing others (i.e. their classroom teacher), while students who set learning

goals were seeking personal gain and knowledge. There have been studies that supported that performance goals had a negative impact on student achievement due to the fact that students had avoided more difficult tasks because they were striving to outshine others instead of exhibiting an intrinsic motivation to make personal growth. In contrast, for students who were more focused on a learning goal, failure was not correlated with personal deficiency, but instead implied that more effort or other strategies were needed.

Self-Brown and Mathews (2003) looked at fifth grade math students for their study. Different classrooms focused on each of the types of goals mentioned above. In classrooms where performance was the focus, students received tokens, which resulted in rewards, for completing simple tasks in math, for example, homework, and daily assignments. These students showed a lesser quality of work because they were motivated by the token. In contrast, those students who were in classrooms where learning goals were made showed greater growth in quality of work. In addition, they outperformed students on assessments and demonstrated a higher competency using different mathematical strategies.

Summary

Research suggested that it could be beneficial for educators to assist students in self-regulatory skills by helping them set appropriate learning goals to engage students and encourage them to take ownership for their own learning. Evidence showed that setting goals increased student motivation which, in turn, increased student performance (Wegge & Hasalam, 2005). When teachers increased academic achievement by helping students reach their individual learning goals, schools were one step closer to narrowing

the achievement gap and promoting confident and competent students to the next grade level.

CHAPTER 3

Methodology and Treatment of Data

Introduction

The third grade students who were the participants in this study took the Measurement of Academic Progress (MAP) test in the fall. Students did not set a benchmark goal prior to taking their fall test. A score of 198 was an average score expected for a third grader in the fall. Spring test scores from the previous year were obtained for all students. The point spread was figured between their spring and fall RIT scores. Students then set goals based on their fall score to help guide their learning for their winter test. The test group of 22 third grade students consisted of 10 boys and 12 girls.

Students began setting learning goals with the help of their teacher to see if this strategy had an impact on their motivation and effort, and ultimately greater achievement in the area of mathematics. The results were measured using the Measurement of Academic Progress (MAP) test. This test was administered three times throughout the 2010-2011 school year (fall, winter, and spring). MAP was a computerized test that adjusted accordingly to every correct or incorrect answer a student received. The idea was that it narrowed in on each student's specific strengths and weaknesses, providing a clearer understanding of what the student should be working on in order to make the greatest gains. After gathering this data, specific learning goals were set for each student in a mini-conference with the student and teacher.

Methodology

For this research, quantitative methodology was chosen. Research focused on establishing a cause-effect relationship. Working with a guiding hypothesis, a specific study emerged as the study progressed. Data was generated from the Measurement of Academic Progress exam taken by students throughout the year. This adaptive, standardized test used the Rasch scale (RIT) to generate average scores for third graders in the fall, winter and spring.

Participants

The study took place at an elementary school in Washington State. The focus area was a group of 22 third grade students consisting of 10 boys and 12 girls. Approximately 98% of the test group was Hispanic and 2% were Caucasian. Twelve of those students were English Language Learners (ELL).

Instruments

The Measurement of Academic Progress (MAP) was used to help teachers understand each student's academic level. MAP was a computerized adaptive assessment that provided educators with the detailed information they needed to build curriculum and meet their students' needs (NWEA.org). The MAP test, given once in the fall, winter, and spring, was used to gather quantitative data. The MAP test was both valid and reliable. MAP was valid because it had adapted test questions so that each student started on a different question, so there was not an opportunity for students to copy each other. MAP was also reliable because it had an extensive bank of questions that had proven over time to produce significantly reliable results. MAP produced an accurate, desired

outcome for each individual student. The test was multiple choice, however, and students were asked to show all of their work on scratch paper. If a student finished the test too quickly, or merely marked the same answer for all questions, the test was invalid. The MAP was used to see if there was a statistically significant correlation between student-set goals and student performance in mathematics.

Design

This study consisted of the one group pretest-posttest design. This design involved "a single group that pretested (O), exposed to a treatment (X), and then tested again (O)" (Gay, Mills, & Airasian, 2009, pg. 253). The success of the treatment was determined by comparing pretest and posttest scores.

Procedure

The researcher first obtained spring MAP scores from the participants when they were in second grade. In the fall, those same students took the MAP test in third grade. The point spread between spring second grade and fall third grade was then compared, assuming that students would continue learning over the summer. After completing the fall MAP test, students began the process of setting goals with the aid of the researcher (and MAP data). Students worked toward their goal until they took the MAP in the winter. Again, point spread was calculated. Comparisons between spring-fall point spread and fall-winter point spread were then tabulated.

Treatment of the Data

All data was logged on the same individual note cards used during the one-on-one teacher-student conferences. A new RIT was determined as well as students' new

learning goals (skills) if necessary. Point spread between RIT scores was used to show a significant positive or negative correlation between goal setting and student performance.

Summary

The Measurement of Academic Progress was used to compare student point spread before and after they set goals. The amount of growth students made was based on their RIT score. Students compared their RIT to the goal they had set earlier in the year.

CHAPTER 4

Analysis of the Data

Introduction

The research concern addressed in this study was that third grade students were not performing at grade level in mathematics. The researcher conducted a study involving 22 third grade students who took the MAP test in the fall, set goals, worked on specific, individual skills to help them achieve their goals, and were tested again in the winter. The researcher then compared the results of the pre and posttests.

Description of the Environment

The parameters for this study included a third grade classroom in a small elementary school in Washington State and the study took place from fall to winter. Students received MAP scores at the end of their second grade year and those scores were compared to the new scores they received in the fall as third graders. After fall scores were tabulated, the researcher helped students set individual goals. The goal process included identifying skills that students needed to address in order to make significant gains for their test in the winter. To address the needs of each student, the researcher used Investigations II math curriculum, and supplemental materials from a variety of resources. All materials directly correlated with Washington State standards. Students were able to work on these skills during class, as well as take home a packet to work on outside of school. Parents were made aware of the purpose of the packet and were encouraged to support their student's learning.

Hypothesis

Student-set learning goals increased student academic achievement in mathematics among third grade students as measured by the Measurement of Academic Progress (MAP).

Null Hypothesis

Student-set learning goals did not increase student academic achievement in mathematics among third grade students as measured by the Measurement of Academic Progress (MAP).

Results of the Study

Using student RIT scores to determine if there was a significant increase in student achievement, the researcher rejected the hypothesis that student-set learning goals increased academic achievement.

Table 1 indicated students' scores at the end of second grade and what their projected average and significant growth scores would have been for fall, as third graders. Students I, M, and P made significant growth without having a goal set. Student T was within three points of his or her projected significant growth score and students L and Q made the grade-level goal for fall, but did not reach their projected goal. Overall, 18% of students increased significantly.

Table 1

Second Grade Spring to Third Grade Fall—Scores Where No Goal Was Set

Student	Spring RIT Score	Average Growth (Fall)	Significant Growth (Fall)	Actual RIT Score	3rd Grade Standard (Fall)
A	182	188	189	177	
B	172	179	180	169	
C	197	202	204	195	
D	187	193	194	187	
E	184	190	191	184	
F	190	196	197	191	
G	179	185	187	177	
H	174	181	182	177	
I	171	178	179	180	
J	182	188	190	181	
K	186	192	193	185	
L	210	215	217	205	
M	194	199	201	205	
N	188	194	195	180	
O	183	189	191	181	
P	189	195	196	201	
Q	213	218	220	216	
R	184	190	191	175	
S	179	185	187	172	
T	192	198	199	197	
U	201	206	208	190	
V	179	185	187	179	
					196

Table 2 indicated students' scores at the beginning of third grade and what their projected average and significant growth scores would have been for winter. Students A, C, D, J, and N made significant growth after setting an individual goal. Students G and R were within three points of their projected significant growth score and students L, M, P, and Q were those who made the grade-level goal for winter, but did not reach their projected goal. Overall, 32% of students increased significantly.

Table 2

Third Grade Fall to Third Grade Winter---Scores Where Goals Were Set

Student	Fall RIT Score	Average Growth (Winter)	Significant Growth (Winter)	Actual RIT Score	3rd Grade Standard (Winter)
A	177	183	185	198	
B	169	176	177	173	
C	195	200	202	202	
D	187	193	194	196	
E	184	190	191	187	
F	191	197	198	188	
G	177	183	185	182	
H	177	183	185	180	
I	177	183	185	180	
J	181	187	189	189	
K	185	191	192	186	
L	205	210	212	206	
M	205	210	212	204	
N	180	186	188	195	
O	181	187	189	184	
P	201	206	208	202	
Q	216	221	223	219	
R	175	181	183	181	
S	172	179	181	177	
T	197	202	204	193	
U	190	196	197	193	
V	179	185	187	179	
					202

Based on the RIT average growth column, more (17) students made average growth and only five students made significant growth. Of the 17 students who did not make significant growth, four of those students still reached the overall goal for third grade. Based on this data, the null hypothesis was accepted due to the fact that students still continued to increase academic achievement, but not at a significant rate.

Findings

According to the data, students who set specific, individual learning goals did not perform at a better rate compared to when there was not a learning goal present. Results were based on the point spread of third grade spring to fall and fall to winter RIT scores as measured by the MAP test.

Discussion

This study's results did not compare positively with other studies of its kind. Other research showed a direct correlation between students who set goals and their rate of achievement. For example, Rader (2005) suggested students showed greater performance when they set and monitored goals that they had set themselves. Secondly, Russell and Phelps (2009) found that, overall, when students felt in control over their academic environment, academic success increased. In addition, most participants viewed goal setting positively with 85% of them stating that they planned to continue to set mastery-focused academic goals in the future. Finally, Self-Brown and Mathews (2003) stated that students who were in classrooms where learning goals were made showed greater growth in quality of work and outperformed students on assessments while demonstrating a higher competency using different mathematical strategies.

However, most of the studies researched had a different type of goal-setting system and were for a longer duration of time between testing. Some of the limitations for this research included, but were not limited to, students' home lives including family structure, academic and emotional support, and/or the parents' ability to help their child with their goals. In addition, the majority of students did not know what a goal was or the significance of goal-setting prior to the study. Students, however, took more initiative in tracking their own work and progress after goals were set. While the majority of students did not increase significantly, there was a difference in the test group's overall growth. From spring to fall eight students increased their achievement without a goal being set. However, from fall to winter after a goal had been set, nineteen students had increased their achievement. This could suggest that while goal setting did not significantly increase student achievement, it may have increased student motivation resulting in a greater number of students increasing their achievement overall.

Summary

According to the data, students who set specific, individual learning goals did not perform at a better rate compared to when there was not a learning goal present. Results were based on the point spread of third grade spring to fall and fall to winter RIT scores as measured by the MAP test. In addition, eight students increased their achievement without a goal being set from spring to fall. However, from fall to winter, after a goal had been set, nineteen students had increased their achievement. This could suggest that while goal setting did not significantly increase student achievement, it may increase student motivation resulting in a greater number of students increasing their achievement

overall. Using student RIT scores to determine if there was a significant increase in student achievement, the researcher rejected the hypothesis that student-set learning goals increased academic achievement.

CHAPTER 5

Summary, Conclusions and Recommendations

Introduction

The purpose of this project was to investigate whether there was a statistically significant correlation between goal-setting and student motivation in third graders with increased student achievement in the academic area of mathematics. The concern of this study was based on low achieving third grade students in mathematics.

Summary

Elementary school students were not making the adequate gains in mathematics necessary to legitimately move up to the next grade (Office of Superintendant of Public Instruction, 2010), and as a result, the achievement gap had been growing wider in education. A study was conducted to accept or reject the idea that student-set learning goals would increase student academic achievement in mathematics among third grade students as measured by the Measurement of Academic Progress (MAP). A group of 22 third grade students consisting of 10 boys and 12 girls were tested. All students were in a general education classroom and were not receiving any special education services at the time of the study. Approximately 98% of the test group was Hispanic and 2% were Caucasian. A quantitative methodology was chosen and research focused on establishing a cause-effect relationship using the one group pretest-posttest design.

Conclusions

In contrast to earlier studies, and those mentioned in the literature review, results indicated that even though students set and monitored their own goals and progress,

students did not significantly achieve any higher than when goals were not present. Research suggested that student-set goals would increase student motivation and effort, resulting in greater performance and higher achieving students. While findings showed that students were more motivated and aware of their own learning, results indicated that students did not significantly perform better, or achieve higher test scores as measured by the MAP.

Recommendations

Based on the conclusions, the following recommendations should be considered for future research. Students should have a well-established idea of what a goal is and how it impacts their learning. In addition, the practice of setting and achieving goals should be ongoing over the course of several years, not just monitored over the course of a single school year. Next, it would be beneficial for students to have the opportunity to take a practice MAP test to use as a checkpoint for monitoring their own progress instead of only taking the MAP fall, winter, and spring. Finally, goals should be initially set using data from students' fall MAP scores, not their second grade spring scores due to the fact that many students regressed over the summer months.

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