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The Effects of Goal Setting in a Developmental Algebra Course

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THE EFFECTS OF GOAL SETTING IN A DEVELOPMENTAL ALGEBRA COURSE

A Thesis
Presented to
The Faculty of the Department of Architectural and Manufacturing Sciences
Western Kentucky University
Bowling Green, Kentucky
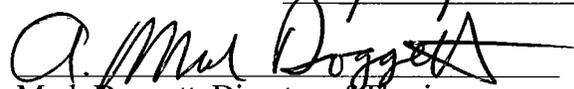

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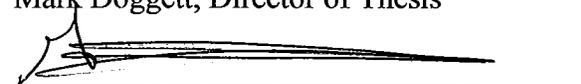Of the Requirements for the Degree
Master of Science

By
Richard Hunt

May 2012

THE EFFECTS OF GOAL SETTING IN A DEVELOPMENTAL ALGEBRA COURSE

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THE EFFECTS OF GOAL SETTING IN A DEVELOPMENTAL ALGEBRA COURSE

Richard Hunt   May 2012   57 Pages

Directed by: Mark Doggett, Greg Arbuckle, and Bryan Reaka

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The purpose of this study was to study the effects of goal setting on students in a developmental algebra course. This study examined the effects on test scores for students that were prescribed a test score goal, students that created their own test score goal, and then compared to a control group. Three classes of developmental algebra were chosen with a total of 25 participants with reported results. Results showed that students with a goal on a test did not score significantly better than students without a goal, but did score significantly better on a test after the goal than tests before the goal.

CHAPTER 1

Background

According to the 2008 U.S. Department of Education Final Report of the National

Mathematics Advisory Panel, mathematics literacy is a serious problem in the United

States. Approximately three out of every four adults cannot explain how to calculate

interest paid on a loan nor calculate miles per gallon for a trip (National Mathematics

Advisory Panel, 2008).

The National Assessment of Educational Progress (NAEP) defines three different

achievement levels that describe a student's actual performance compared to the desired

performance at each grade level tested (4th, 8th, and 12th). The three levels are Basic,

meaning partial mastery of prerequisite knowledge and skills, Proficient, meaning

competency of challenging subject matter, and Advanced, meaning superior performance

(NAEP, 2009).

Low Achievement Levels In Math

While the 2009 Nation's Report Card, reported by the NAEP showed 64% of 12th

graders at or above basic level, which is three percentage points higher than 2005, it is

still lower than 1996 when 69% were above the basic level and in 2009, only 26% scored

at or above proficient level(National Assessment for Educational Progress). In 2009,

36% of 12th graders scored *below* the basic level (NAEP).

There are several factors identified by the NAEP (2009) and the US Dept. of

Education (2008) that strongly affect student learning in math and test scores. Results are

mixed when trying to find a correlation between teacher content knowledge measured by

courses taken and/or mathematics degree and student scores for students below the ninth

grade. There does appear to be an effect in secondary education. The more math classes

a high school teacher has had in college, the more prepared the math teacher is in teaching high school level algebra (National Mathematics Advisory Panel, 2008, p. 36).

Race and ethnic groups showed differences with Asian/Pacific Islander students having the highest scores in 2009. Whites had the second highest scores with Black students having the lowest scores. Gender was a factor with males scoring higher than females in both 2005 and 2009 by two and three points respectively. Parent education was identified as a factor where students with parents who graduated college scored highest compared to those who had some college (14 points higher), were a high school graduate (22 points higher), or did not finish high school (29 points higher). Another factor was students taking advanced math courses in high school. Students that took calculus scored 78 points higher than those completing Algebra 1 or lower. The last factor identified was student plans after high school. The NAEP asked students what they planned to do after high school. Those that were planning to attend a four-year college scored 26 points higher than those planning to enter the military, 28 points higher than those planning to attend a two-year college, 31 points higher than those planning to attend a vocational, technical, or business school and 33 points higher than those planning to work full time (NAEP, 2009).

The Importance of Goals

Of all the factors listed, the one factor that the student has more control over than any other is their plans after high school. Plans after high school in this paper are referred to as post-secondary educational goals. However, even with a high level of control, left unguided the student is at risk of having goals set that are related neither to academic success nor to complete the necessary tasks to insure academic success.

In a 2002 paper, Dunham and Frome found that encouragement from teachers play a critical role in middle school students' goal setting for academic success, such as trying to do their best and completing and turning in assignments. When teachers set clear expectations and insist that students follow through by completing their work, students demonstrated an increased level of work compared to students with teachers that did not hold them to these expectations and standards.

The data indicate that 69 percent of the students surveyed report encouragement often from their teachers to do well in school, and 50 percent of these students report they often try their best. By contrast, students who reported their teachers provided lesser levels of encouragement were 20 percent less likely to report trying to do their best. Students who did *not* complete their homework assignments as frequently reported that teachers provided less encouragement and were almost half as likely to report trying to do their best in school(Dunham & Frome, 2002).

Could students benefit from setting goals specific to their class? Literature strongly suggests the answer to this question is yes. Goal setting has been shown to improve work performance in a variety of jobs and tasks, athletic performance, rehabilitation, and education.

Beliefs and Self-Efficacy

The National Mathematics Advisory Panel (2008) in its final report to the US Department of Education found the following:

Experimental studies have demonstrated that children's beliefs about the relative importance of effort and ability or inherent talent can be changed, and that increased emphasis on the importance of effort is related to greater engagement in

mathematics learning and, through this engagement, improved mathematics grades and achievement.

Research demonstrating that beliefs about effort matter and that these beliefs can be changed is critical. Much of the public's resignation about mathematics education (together with the common tendencies to dismiss weak achievement and to give up early) seems rooted in the idea that success in mathematics is largely a matter of inherent talent, not effort (p. 31).

According to Hannula in speaking on the theory of self-regulation, "for a change in motivation to take place there must be a desired goal and one's beliefs (including efficacy beliefs) must support the change" (2006, p. 170). Self-efficacy can be described as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. Self-efficacy beliefs determine how people feel, think, motivate themselves, and behave"(Bandura, 1994). Hannula goes on to explain where a student had changed an ego-defensive goal that had dominated her behavior and was apparent with a statement such as "You don't need math in life" to a performance goal such as "I will raise my math score" (p. 170). The change was driven by an awareness of the importance of school success together with more positive self-efficacy beliefs.

In a study conducted by Zimmerman, Bandura, and Martinez-Pons (1992) it was found that:

Students' beliefs in their efficacy for self-regulated learning affected their perceived self-efficacy for academic achievement, which in turn influenced the academic goals they set for themselves and their final academic achievement.

Students' prior grades were predictive of their parents' grade goals for them,

which in turn were linked to the grade goals students set for themselves (p. 663).

The researchers found that the students' goals were significantly affected by their

parents' goals for them and were predictive of their final grades.

Goals can potentially change one's belief in their abilities and their behaviors.

With behavioral changes can come changes in actions that support the goals. As a result,

self-efficacy can increase which can in turn increase motivation to achieve the goal.

Significance

The significance of this study involves the potential better performance of

students taking a developmental algebra course when setting specific and challenging

goals. If this can be achieved for a math class, then it may also positively affect other

courses as well. This could lead to a need for a lesser number of developmental courses,

reduce manpower, reduce costs, and increase retention. This would also apply to students

that really did not need the developmental course or would have passed the first time had

they set specific and challenging goals.

Hypothesis

The purpose of this research was to study the effects of goal setting in a

developmental algebra class. The hypothesis was that students that either have goals

prescribed to them or participate in the setting of their own goals with respect to test

scores will have higher test scores than students that do not have a goal.

Research questions

This research attempted to answer the following questions:

1. Did goal setting benefit students in a developmental math course?

2. Did the goals affect their test scores?

3. Did it matter if the goals are prescribed to them or if the students participate in the setting of their own goals?

4. Did the students with goals perform differently than students without goals?

Assumptions

Assumptions for this study are a) there is a relationship between personal or external expectations and performance, b) specific and challenging goals will increase performance, c) students who set goals are more likely to achieve them, and d) instructors who have high expectations of students achieve better results from students.

Limitations

Limitations for this study include

- the instructor or assigned to the developmental algebra course being considered for this study;

- the number of courses available for this study;

- the number of students enrolled in each course that can be considered for this study;

- the amount of time the instructor will allow for the researcher to conduct the treatment with each class;

- the content material and sequence that will be covered by the instructor before and after the time of the treatment;

- the attendance of the students during the time of this study; and

- the time of day of the courses for this study.

Delimitations

Delimitations for this study include

- involving one class each for treatment one, treatment two, and control;

- a small sample size for this study;

- involving classes from one instructor;

- using one class period to conduct the treatment;

- measuring one test score as the dependent variable; and

- students under the age of eighteen will not participate in this study.

Definitions of Terms

For the purposes of this study, the following operational definitions applied:

Group Think: When people outwardly agree with something they really do not believe just so they are perceived as a supportive member (Latham & Locke, 2002).

Math Placement Exam (MPE): An exam to test students' skills in algebra (Source: WKU Mathematics Department).

Commonwealth School: The community college associated with Western Kentucky University (Source: WKU Admissions Department).

Motivated Strategies for Learning Questionnaire (MSLQ): A self-report instrument designed to assess college students' motivational orientations and their use of different learning strategies for a college course (Pintrich, 1991).

CHAPTER 2

Review of Literature

Goal Setting

According to Latham and Locke (1979), setting specific and challenging goals were more important than job enrichment and pay unless bonuses were included and dependent on achieving certain objectives. Even feedback had little effect unless it leads to more challenging goals.

It has been shown that there is a linear relationship between job performance and the degree of difficulty of the goal one is committed to attain. Goals that are specific and challenging lead to better performance than goals that are vague such as doing your best. Latham and Locke (2006) stated the following:

> Why are goals so effective? A goal is a level of performance proficiency that we wish to attain, usually within a specified time period. Thus goal setting is first and foremost a discrepancy-creating process, in that the goal creates constructive discontent with our present performance. For example, if people discover that their performance is below the goal that has been set, countless studies show that, given commitment to the goal, they are likely to increase their effort or change their strategy in order to attain it (p. 332).

Two key moderators identified by Locke and Latham (2006) were "feedback, which people need in order to track their progress and commitment to the goal, which is enhanced by self-efficacy and viewing the goal as important" (p. 165).

When people are confronted with a goal, they tap into their knowledge and skills; they use deliberate planning, and develop task strategies using both cognitive and

behavior mechanisms that serve to direct attention and effort towards goal relevant

activities (Latham & Locke, 2002).

In Latham & Locke's 1979 study, they reported that a logging crew with a leader

that set a specific production goal for the day or week, but had relatively no

mechanization had high productivity compared to two other logging crews that had more

mechanization (p. 70). In the face of criticism by managers that attributed this higher

productivity to the Hawthorne Effect, Latham and Locke conducted another study with

twenty independent logging crews that had similar sizes and mechanization all with

leaders that stayed on the job. Half the crews were randomly selected to receive goal

training while the other half did not receive any goal training and served as the control

group. They visited all twenty crews equally to control for the Hawthorne Effect and

after twelve weeks the crews that had set goals performed significantly higher than the

control group (p. 71).

Potential Negative Effects of Goals

In 2002, Latham & Locke reported ten potential pitfalls in goal setting and ways

to overcome them. They discussed the importance of specific and challenging goals over

vague or "do your best" goals (p. 332). However, the first potential problem is that a

difficult performance goal may become a hindrance when there is a lack of knowledge of

how to attain the goal. In this type of circumstance, it is best to give specific difficult

learning goals that support the performance goal.

A second common pitfall is when goals are conflicting among members of a

group. The behavior of the members of a group will respond differently if the goal is

presented competitively instead of cooperatively. A third potential problem is when the

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goal is framed in a negative perspective instead of positively and viewed as a threat. Instead of stating "don't mess up on more than three of these fifteen problems", the goal should be stated "find the answer to twelve or more of these fifteen issues" (p. 335).

A fourth issue is when punishment is used when the goal is not attained. Errors and failures will always occur when setting and pursuing difficult and challenging goals. A fear of failure can discourage a person from setting and achieving a goal. People perform higher when the time frame to attain the goal is reasonable, they are given the opportunity and fully allowed to make mistakes, and then encouraged to learn from the mistakes.

A fifth potential problem is when people rely too heavily on past strategies from previous successes and then misapplying them to even more challenging goals. One way to counteract the misapplication of past strategies to a current situation is to set sub-goals that support the longer term goal. Sub-goals encourage feedback and allow for correction if the goal is out of congruence with reality. A second way to counteract this is to "encourage constructive conflict" (p. 336). This can prevent "group think" where people will outwardly agree with something that they really do not believe just so they are perceived as a supportive member.

A sixth potential problem lies with money as a motivator to attain a goal. People are more likely to overstate their performance when they are just shy of attaining their goal. They may focus too heavily on making the numbers look good instead of the results. People can also find ways to make an easy goal appear to be difficult when motivated by monetary gain. Ways to overcome this are to (1) not punish when the goal is not attained, (2) set the monetary goal up as a percentage as the minimum is met that

can increase with increased results, (3) properly judge and reward based on the difficulty of attaining the goal, and (4) have zero tolerance for unethical behavior.

A seventh issue that can lead to irrational and risky behavior is when the goal is tied to self-esteem. As a result, the goal may not be abandoned even in the face of overwhelming evidence that it should be. People should always put reality first and remain adaptable to the situation realizing that the goal attainment does not define who they are.

An eighth potential downside is when performance that isn't perceived as part of the goal is ignored. It must be clear as to what outcomes are necessary for the goal attainment. A ninth possible concern is when people have stretched too far with the number of goals set and they experience increasing stress. Proper training should be in place to help people set challenging, yet achievable, goals.

The tenth and final potential pitfall is when unattainable goals are set for people who have reached or attained a challenging goal in the past. When progressively harder and harder goals are set for those who have a record of achieving goals, it can be perceived as punishment. High performing individuals and groups should be allowed to participate or set their own goals.

In 2004, Schweitzer, Ordonez & Douma reported results that supported three hypotheses where people overstated performance for specific and unmet goals, unmet reward goals, and falsely claimed goal attainment when failing to reach by a small margin compared to those that failed to reach by a large margin. In discussion, the researchers stressed the importance of setting high ethical standards and vigilance in monitoring performance.

In the paper, Goals Gone Wild (2009), criticisms to goal setting include the risk of goals being too narrow and causing people to overlook important issues that are related to the goal. An interesting study cited in this paper was when students were asked to proofread a paragraph that contained both grammatical and content errors, students that were asked to do their best were more likely to correct both the grammatical and content errors than students asked to focus on either of the two types of errors (Ordonez, Schweitzer, Galinsky, and Bazerman). Other criticisms include having too many goals, inappropriate time lines, goals that are too challenging, promotion of unethical behavior, psychological effects of goal failure, not having learning goals, creating a competitive environment, diminishing intrinsic motivation, and not individualizing goals. Ordonez et al. stress the importance of learning how to set and when to set goals through training and risk mitigation. Many of these risks were addressed in Latham & Locke's 2002 paper, but the scholarship of Ordonez et al. (2009) was questioned in a 2009 paper written by Latham & Locke. They purport that Odonez et al. frame goal setting as a remedy for problems rather than a motivator for high performance. The researchers also argue the use of anecdotal evidence to support their argument, not accounting for confounding variables when drawing conclusions, and not citing relevant studies.

Goal Setting Examples

In 2009, a University of Kent study showed a positive correlation between the performance of triathlon athletes and the level of personal standards and goals they held themselves against (Stoeber, Uphill, & Hotham). In 2004, a study with NCAA swimmers concluded that "moderately difficult goals" were preferred and that a strong internal locus of control drove performance (Stout, 1999).

In another study, it was shown that patients with brain injuries responded significantly faster on a reaction time test when given specific and difficult goals compared to patients that were given a "do-your-best" goal. The results were replicated using arithmetic tasks and indicated that brain-damaged patients were able to self-regulate their behavior when given specific and difficult goals (Cox & Klinger, 2004, p. 446).

Research conducted on first year psychology students using the Motivated Strategies for Learning Questionnaire (Pintrich, 1991) as an instrument to measure the motivational beliefs and use of learning strategies found that expectancies and the perceived value of the course were highly correlated with grade performance (Watson, McSorley, Foxcroft, & Watson, 2004). This implies that not only is expectancy important in goal setting, but also insuring that the student perceives intrinsic or extrinsic value related to the goal. Watson et al. found that "Learners that organised their study time, established a regular place to study, and consciously persisted in their efforts to learn the material earned high marks" (pp. 200-201). The researchers also found that student anxiety was highly correlated with lower performance. Pintrich (1991) stated the following:

Test anxiety has been found to be negatively related to expectancies as well as academic performance. Test anxiety is thought to have two components: a worry, or cognitive component, and an emotionality component. The worry component refers to students' negative thoughts that disrupt performance, while the emotionality component refers to affective and physiological arousal aspects of anxiety (p. 18).

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A study conducted on 1131 students from secondary schools with ages ranging from 15 to 17 years of age showed that students that had "combined learning and performance goals tend to demonstrate superior ability by trying to learn more" compared to students that had a work avoidance orientation (Brdar, Rijavec, &Loncaric, 2006, p. 62). The researchers discussed different coping mechanisms that were used by the students. An interesting point is that students who had performance goals with a work avoidance orientation tended to use an emotional coping strategy and therefore avoided situations where they felt they could not succeed. Avoidance motivation can be "represented in the form of test anxiety, fear of success, cost of success or fear of failure" (p. 64). This implies the importance of addressing a students' potential fear of failure and overcoming a lack of belief in their own success.

In 2004, Herkstroeter reported a study with twelve 5th graders and twelve 6th graders utilizing mental concentration and goal setting techniques involving setting weekly general and specific goals that showed a significant increase in GPA in a three week period. In 2005, Meuschke conducted a study on students in community college math courses and found that students who "endorsed a mastery goal orientation were more likely to engage in adaptive help seeking behaviors" and "self-efficacy in math also was found to influence student's help seeking behaviors" (p. 87). Students that did not understand the material or were having difficulty of some kind would either seek help or would not seek help. A student's goal orientation, such as task orientation, has been found to positively influence the student's help seeking behaviors (Meuschke, 2005). An interesting point made in this study was that "students who perceived their ability to be low, those who need help the most, were more likely to avoid seeking help (p. 21). From

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this, we can see that a student's perception of their own ability can affect the actions they take to help themselves or not.

Self-Regulation

Pintrich (1991) refers to metacognition as "the awareness, knowledge, and control of cognition" (p.24). He states there are three general areas of metacognitive self-regulation:

1. Planning activities such as goal setting and task analysis that can help to bring forth prior knowledge which can help to organize and comprehend the current material.

2. Monitoring activities which can include tracking one's own attention while reading.

3. Regulating which refers to correcting one's behavior while attempting a task.

He also refers to one's control of learning beliefs as being "students' beliefs that their efforts to learn will result in positive outcomes. It concerns the belief that outcomes are contingent on one's own effort, in contrast to external efforts such as the teacher. If students believe that their efforts to study make a difference in their learning, they should be more likely to study more strategically and effectively" (p. 15).

Need for Developmental Math

What about the student who is not mathematically well prepared due to a combination of factors, but still wants to enter and be successful in college? One option is for the student to take a developmental math course. At Western Kentucky University (WKU), students must take a math placement exam (MPE) if they are not using Compass

or Kyote test scores which must be submitted prior to enrollment (once enrolled the student must take the MPE if they have not registered for a math class) and the results determine math class eligibility. If the MPE score and the ACT score are below the given cutoffs, they must take a developmental math course in beginning or intermediate algebra if their program requires college algebra. Even if their program does not require college algebra and the student does not complete a developmental math course with a Math ACT score that is below the cutoff, the student must enroll in a special section of a class that includes mandatory academic support sessions in addition to the regular class meetings(Source: WKU Mathematics Department).

From fall 2008 through fall 2010 there were 93,746 students enrolled at WKU. Of those, 9,560 were enrolled in the Commonwealth School (the community college associated with the University) representing just over 10% of the total student population. Of the 9,560 enrolled, 5,911 or approximately 62% enrolled in a developmental math course (055C Basic Algebra Skills or 096C Intermediate Algebra). Of those 5,911 students, 2,337 received a D or F grade in the class and 429 withdrew from the course. From this, 39.5% of the developmental math enrolled students did not make a grade high enough to enroll in the next course and counting those that withdrew, nearly 47% of these students would have to repeat the course. During this same time period, there were 944 or 16% of the students repeating the developmental math courses. This infers that many students who need to retake the course did not during this time frame and plan to retake the class at a later date, or will not retake the class at all (Source: WKU Office of Institutional Research).

With 39.5% of students attending developmental math courses at WKU from fall 2008 through fall 2010 achieving a grade below C, it is clear that students need a

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different approach. With 36% of high school 12th graders scoring below a basic level in mathematics in 2009, it is likely the enrollment in developmental math courses will remain high. The apparent success of goal setting in a variety of settings which includes industrial, sports, rehabilitation, and education makes goal setting a valid approach to helping students.

CHAPTER 3

Method

Introduction

The purpose of this study was to measure the potential effects of college students' test scores in a developmental algebra course after goal setting compared to students that did not set a goal. The methodology used for this research was quantitative using results from the MSLQ and test scores. The instructor variable was controlled by selecting classes from one instructor. Other variables were controlled by selecting classes that meet on the same days of the week and meet for the same length of time per day. One class was designated the control group and did not receive treatment. The second class was designated group two and was prescribed their goal after a goal setting class. The third class was designated group three and had self-set goals after receiving the goal setting class.

Participants

The participants were from three different sections of Developmental Math (DMA) 055C Beginning Algebra courses all taught by the same instructor. Informed consent was obtained from those students that agreed to participate in the study. The instructor had been previously contacted and agreed to allow this study to be performed. All sections met on Tuesdays and Thursdays with each section meeting at different times of the day. Table 1 shows a summary of the students that participated in this study.

Table 1

Summary of Student Participants

		No.			
Group	Class time	Students	Informed consent	Treatment	Test three[a]
1 (Control)	8:00 am – 9:20 am	15	10	-[b]	7
2	9:35 am – 10:55 am	25	14	9	7
3	11:10 am – 12:30 pm	27	13	12	11

[a]Completed test three on date given to class. [b]Control group did not receive goal setting class.

Procedure

The researcher met with the different DMA 055C sections to explain the research and obtain informed consent found in Appendix A. The students that agreed to participate were asked to complete a demographics survey which can be found in Appendix B and the MSLQ found in Appendix C. Demographics were not collected on all students and no inferences were drawn from the information so the data is not included. The MSLQ is a "self-report instrument designed to assess college students' motivational orientations and their use of different learning strategies for a college course" (Pintrich, 1991, p. 3). The MSLQ has a motivation section and a learning strategies section. The motivation section evaluates students' beliefs in their ability to be successful in the course, goals for the course, student values, and test anxiety. The learning strategy section assesses students' cognitive and metacognitive strategies along with their approach to resource management. The MSLQ was used in this study to measure the above mentioned aspects before and after the treatment. The last four digits of the students' WKU ID were collected with all surveys, questionnaires and data.

After completion of their second exam and before the test three material was presented by the instructor, the researcher returned and conducted a goals class for group two and three that lasted one class period. The researcher asked the control group to write a paragraph on how they felt about math and school in general and was unaware they were not receiving the same treatment. Topics of the goals class were as follows:

1. Choosing a specific goal, the importance of clarity, and writing the goal down on paper.

2. Selecting an achievable goal and believing in the goal.

3. Overcoming potential self-limiting beliefs that can prevent achievement of the goal.

4. Understanding and writing down the purpose of the goal.

5. Identifying potential roadblocks and setbacks.

6. Identifying steps to overcome potential roadblocks and setbacks.

7. Making decisions that support the goal.

8. Having a plan of action to achieve the goal.

These topics were chosen as the most important by the researcher to be covered in one class period. The intention of the above topics was to help the student a) understand the process of setting a specific, challenging, and attainable goal; b) understand that the purpose of the goal can be relied on to help increase motivation to accomplish tasks that support the goal; c) understand that setbacks and roadblocks are inevitable and should not be seen as failures, but rather problems that can be overcome; and d) having a plan of action to refer to at times when motivation may be low. The goal setting class was presented in a motivational tone and was participatory in nature. Students were asked to provide answers and examples to the above points.

Treatments

   The control group did not receive the goals class and was asked to write a paragraph on how they felt about their math class and school. After receiving the goals class, group one was prescribed a goal of achieving an A on exam three and group two was asked to set their own goals. All participants in group three chose an A on test three except for one student that chose a B. Groups two and three were asked to write their goal in the present tense, in a first person point of view, and stated positively. The groups were asked to list actions they could take to support the goal and to overcome potential risks and roadblocks that could negatively affect the accomplishment of the goal. The groups were also encouraged to read their goals on a regular basis and to visualize the attainment of the goal. The students were given an optional template to use where they could fill in information about their goal, the actions they would take and their purpose, along with a positive affirmation with signature and date. This template can be found in Appendix D. The students were also given an optional check sheet they could use to track the reading and visualization which can be found in Appendix E. The researcher collected attendance data and grade data from the instructor from the beginning of class through exam two. After the completion of test three, attendance data and grade data were collected for all assignments after test two through test three. Also, the MSLQ was re-administered after the completion of exam three before the students received their test three scores.

Threats to Validity

Threats to validity for this study were a) that enough students agreed to participate, b) that for students who agreed to participate, they actively engaged in the goal setting activity, c) that a significant number of students that agreed to the study remained in the class, d) that there was little or no bias caused by students sharing information with other students about the study, and e) that there was little or no bias caused by students sharing information with the instructor.

Data Analysis

Post-treatment grade data was compared to baseline data for statistical significance. Descriptive statistics of the pre-treatment and post-treatment test results were summarized. A one-tailed t-test and paired t-test was performed to test the hypothesis that students with goals, whether prescribed or self-chosen, would have a higher test score than the control group and to test if post-treatment test results were significantly higher than pre-treatment test results for all groups.

The MSLQ was chosen by the researcher to gather students' "motivational orientations and their use of different learning strategies for a college course" (Pintrich, 1991, p. 3) due to the reliability and predictive validity of how well students will perform in the course (Pintrich, Smith, Garcia, & McKeachie, 1993). The MSLQ has a motivation section and a learning strategies section with subscales for each. Table 2 shows the sections in the first column and the scales in the second column with the corresponding subscales in the third column. The MSLQ has 81 items with the motivation section comprising 31 items and the learning strategy component comprising 50 items. The items are answered by the student using a Likert scale ranging from one to

seven with one being "not at all true of me" and seven being "very true of me." Only the

motivation section and the corresponding scales are under consideration for this study.

Table 2

MSLQ Sections and Scales

Section	Scales	Subscales
Motivation		
	Value components	Intrinsic goal orientation
		Extrinsic goal orientation
		Task value
	Expectancy components	Control of beliefs
		Self-efficacy for learning and performance
	Affective component	Test anxiety
Learning strategies	Cognitive and meta-cognitive	Rehearsal
		Elaboration
		Organization
		Critical Thinking
		Meta-cognitive self-regulation
	Resource management strategies	Time and study environment
		Effort regulation
		Peer learning
		Help seeking

The subscale correlations are significant and signify predictive reliability (Pintrich, 1991,

p. 75). Subscale descriptive statistics for the motivation section including means and

standard deviations were calculated and subscale correlation analysis compared to grade performance were computed for all data. Figure 1 shows the relationship of the treatment to grade performance and the MSLQ.
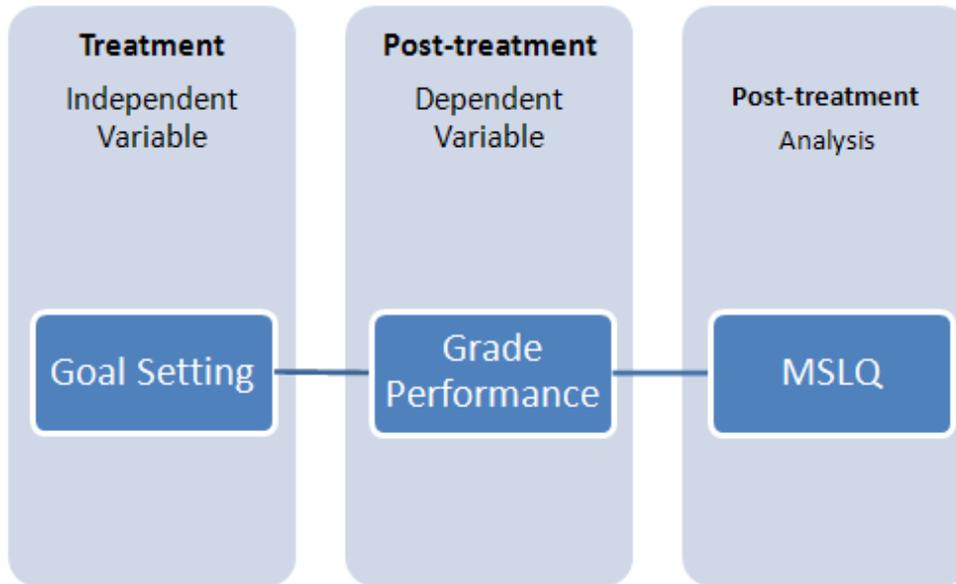
Figure 1. Model showing goal setting as the independent variable and the relationship to grade performance. The MSLQ will serve as a pre to post-treatment analysis instrument.

Summary

Students' performance data including attendance data and assignment score data were collected before and after treatment. Statistical analysis at a .05 alpha level was performed on the data to detect any significant changes that may have occurred as a result of the treatment. In addition, the MSLQ was used before and after treatment. A correlation analysis was performed on all MSLQ motivation subscale results compared to grade performance.

CHAPTER 4

Results

The researcher assumes that test scores sampled from a student population follow a Gaussian distribution or can be approximated as such. Normality tests were performed for the pre-treatment and post-treatment test score results and are shown in Table 3.

Test For Normality

Table 3

Normality Test Results for Pre-Treatment and Post-Treatment Test Results.

		Ryan-Joiner		Anderson-Darling	
Group	n	RJ	p	AD	p
Pre-treatment	25	.953	**.037**	.918	**.016**
Post-treatment	25	.981	.100	.492	.199

The assumption is that the distribution of the overall population of test scores can be approximated by a Gaussian distribution, but results from both parametric and nonparametric tests for significance are provided due to pre-treatment p-values being less than .05.

Test Results

Table 4 provides the results of a one-tailed F-test for data approximated by a Gaussian distribution and Levene's test for data not approximated by a Gaussian distribution for comparing standard deviations of pre and post-treatment results. These tests were run to check for significant differences in standard deviations. Both the parametric F-test and nonparametric Levene's test were run due to the significant results showing enough evidence to reject the null hypothesis that the pre-treatment data followed a Gaussian distribution.

Table 4

F-Test and Levene's Test Comparing Pre-Treatment and Post-Treatment Standard Deviations.

Group	n	Pre-Treatment SD	Post-Treatment SD	F-test p	Levene's Test p
1[a]	7	14.5	14.9	.525	.283
2	7	18.0	8.1	**.036**	.090
3	11	25.6	9.5	**.002**	**.020**

[a]Control group.

Table 5 provides descriptive statistics for each group's test scores pre and post-treatment with results for tests of significance. One-tailed t-test results are shown due to the prediction of increased test scores after treatment and paired t-test results are shown because repeated measurements are taken from the same subjects before and after treatment. Due to the results of the F-test and Levene's test signifying a significant reduction in standard deviations in groups two and three, unequal variances were assumed for the t-tests. The nonparametric Mann-Whitney for unpaired subjects and Wicoxon Signed Rank Test for paired subjects are shown comparing pre to post test scores.

Table 5

Descriptive Statistics of Test Scores for Each Group with Pre to Post One-Tailed t-test, Paired t-test, Mann-Whitney, Wilcoxon Signed Rank Test Results.

Group	n	Pre-treatment M	SD	Post-treatment M	SD	One-tailed t-test df	p	Paired t-test p	Mann-Whitney p	Wilcoxon p
1[a]	7	87.1	14.5	88.3	14.9	11	.440	.370	.283	.417
2	7	67.6	18.0	82.9	8.1	8	**.038**	**.040**	**.024**	**.026**
3	11	71.1	25.6	87.6	9.5	12	**.034**	**.009**	.100	**.012**

[a]Control group.

Figure 2 displays an interval plot showing pre and post-treatment test result comparison for groups one, two and three.
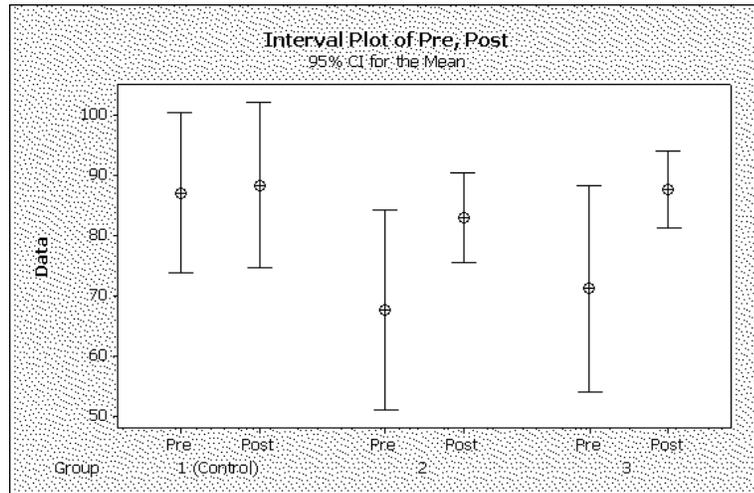
Figure 2. Interval plot comparing pre and post-treatment test scores.

Table 6 provides t-test results comparing post-treatment test scores for groups two and three to the control group.

Table 6

One-Tailed t-test of Group 2 and Group 3 Compared to Control.

Group	n	Group 2 (n=7)		Group 3 (n=11)	
		df	p	df	p
1 (Control)	7	9	.791	9	.540

MSLQ Results

MSLQ results showing means and standard deviations are shown for groups one,
two and three in Tables 7, 8 and 9 respectively. Interval plots for the means are shown in
figures 3, 4 and 5 respectively.   A higher mean is better for all subscales except test
anxiety where a higher score means more worry (Pintrich, 1991).

Table 7

MSLQ Motivation Section Descriptive Statistics for Group One.

Subscale	Pre (n=7)		Post (n=4)		Difference in means
	M	SD	M	SD	
Intrinsic goal orientation	5.11	1.29	5.63	1.05	.52
Extrinsic goal orientation	5.39	1.38	6.06	0.75	.67
Task value	5.52	1.32	5.46	0.94	-.06
Control of beliefs	6.07	0.80	6.00	1.06	-.07
Self-efficacy	5.48	1.46	5.28	2.32	-.20
Average[a]	5.51	-	5.69	-	.18
Test anxiety	3.63	1.82	4.40	0.99	.77

[a]Average of all subscales was calculated for comparison except for test anxiety where a lower value is better.

Table 8

MSLQ Motivation Section Descriptive Statistics for Group Two.

| Subscale | Pre (n=7) | | Post (n=4) | | |
	M	SD	M	SD	Difference in means
Intrinsic goal orientation	4.57	0.95	4.88	0.43	.31
Extrinsic goal orientation	6.25	0.58	5.98	0.93	-.27
Task value	4.62	0.71	4.75	0.70	.13
Control of beliefs	4.61	0.59	4.19	1.07	-.42
Self-efficacy	4.80	0.68	5.28	0.77	.48
Average[a]	4.97	-	5.02	-	.05
Test anxiety	5.11	1.31	4.30	0.48	-.81

[a]Average of all subscales was calculated for comparison except for test anxiety where a lower value is better.

Table 9

MSLQ Motivation Section Descriptive Statistics for Group Three.

| Subscale | Pre (n=11) | | Post (n=9) | | |
	M	SD	M	SD	Difference in means
Intrinsic goal orientation	4.45	0.87	5.03	0.76	.58
Extrinsic goal orientation	5.75	1.44	6.19	0.89	.44
Task value	4.32	1.85	4.66	1.26	.34
Control of beliefs	4.75	1.27	5.67	0.73	.92
Self-efficacy	5.70	1.22	5.99	0.83	.29
Average[a]	4.99	-	5.51	-	.52
Test anxiety	3.72	1.96	3.31	1.96	-.41

[a]Average of all subscales was calculated for comparison except for test anxiety where a lower value is better.
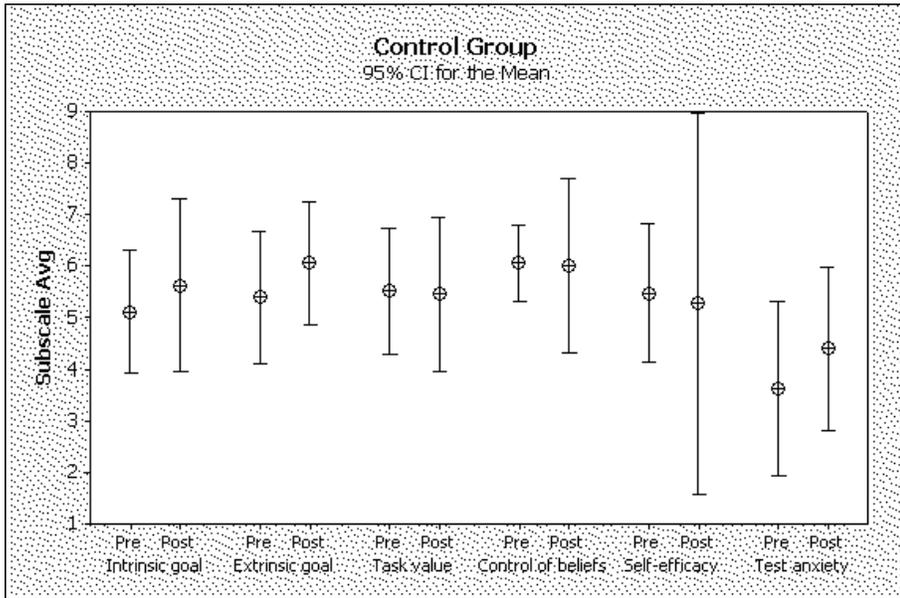
Figure 3. Interval plot comparing pre and post-treatment MSLQ subscale means for the control group.
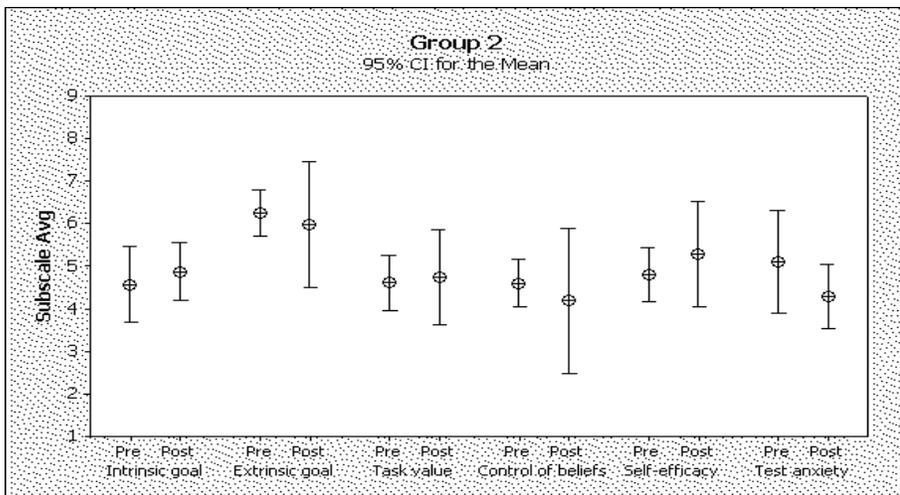
Figure 4. Interval plot comparing pre and post-treatment MSLQ subscale means for group 2.
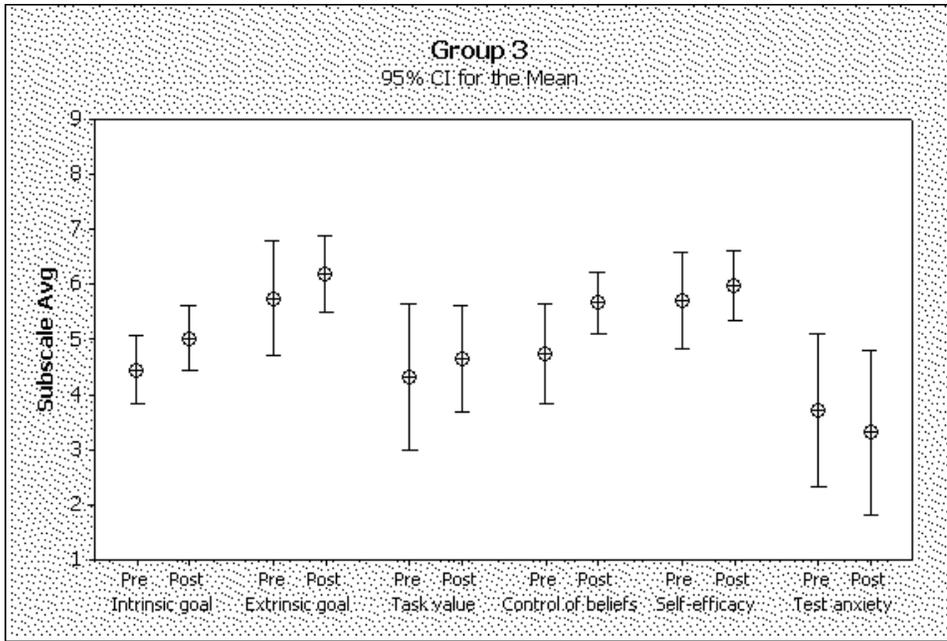
Figure 5. Interval plot comparing pre and post-treatment MSLQ subscale means for group 3.

Table 10 shows correlation analysis of each subscale compared to test scores for pre and post-treatment results for all groups.

Table 10

MSLQ Motivation Section Correlation Results (Pearson Correlation and P-Values) for All Groups Pre and Post.

Subscale	Intrinsic goal	Extrinsic goal	Task value	Control of beliefs	Self-efficacy	Test anxiety
Extrinsic goal	.441[a]	-	-	-	-	-
	.004	-	-	-	-	-
Task value	.722	.559	-	-	-	-
	.000	**.000**	-	-	-	-
Control of beliefs	.601	.322	.556	-	-	-
	.000	**.040**	**.000**	-	-	-
Self-efficacy	-.072	-.290	.047	.059	-	-
	.656	.066	.772	.713	-	-
Test anxiety	.373	.662	.334	.107	-.631	-
	.016	**.000**	**.033**	.506	**.000**	-
Test Avg.	.012	-.129	.119	.182	.582	-.527
	.939	.423	.459	.256	**.000**	**.000**

[a]Pearson correlation values are on top and corresponding p-values are below each.

A correlation for the data revealed strong positive correlations between intrinsic goal orientation and extrinsic goal orientation, p=.004; intrinsic goal orientation and task value, p<.001; intrinsic goal orientation and control of beliefs, p<.001; intrinsic goal orientation and test anxiety, p=.016; extrinsic goal orientation and task value, p<.001; extrinsic goal orientation and control of beliefs, p=.040; extrinsic goal orientation and test anxiety, p<.001; task value and control of beliefs, p<.001; task value and test anxiety, p=.033; and self-efficacy and test average, p<.001. Strong negative correlations were found between test anxiety and self-efficacy, p<.001 and test anxiety and test average, p<.001.

CHAPTER 5

Discussion

The primary purpose of this study was to study the effects of goal setting on college students attending a developmental algebra course. Specifically, this research focused on students that had a goal set for them or participated in the setting of a goal and if these students would perform better on a test than students that did not receive a goal. Also, students' test scores before and after the goals class were tested for a significant increase.

Hypothesis

There was not a significant difference in the post-treatment test scores for students that were prescribed a goal (M=82.9, SD=8.1), students that set their own goal (M=87.6, SD=9.5), and test scores of students that did not set a goal (M=88.3, SD=14.9); p=.791 and .540 respectively. The results of this study suggested that goal setting does not significantly increase scores over students that do not set goals under these conditions.

Pre to Post-Treatment Analysis

When scores before the goals class were compared to scores after for groups two and three and then compared to the control group, the following results were observed:

1. Test score standard deviations after the goals class compared to the test score standard deviations before the goals class were significantly lower for groups two and three while the standard deviation for the control group was not significantly lower.

2. Test score means after the goals class compared to the test score means before the goals class were significantly higher for groups two and three while the mean for the control group was not significantly higher.

The improvement in both the standard deviations and means for the test score averages of groups two and three suggested that a positive effect was experienced as a result of the goal setting. These findings are in agreement with Herkstroeter (2004) which found that grade performance in math increased significantly for fifth and sixth graders that participated in goal setting activities. The control group did not have a measurable decrease in standard deviation or increase in test score means. This may imply that a lack of goal setting has little or no effect on test performance. The control group test score means for pre and post-treatment were similar to the post-treatment test score means of groups two and three, but the potential for improvement still existed.

MSLQ Analysis

All groups had an increase in the mean of all subscales, which did not include test anxiety, with group three having the greatest increase. Group three was the only group that had an increase in all subscales, not counting test anxiety. This could be explained by the greater sample size in group three or caused by group three being allowed to create their own goals. Groups two and three had a decrease in test anxiety while the control group had an increase. The increase in group one's test anxiety could be related to those students not receiving the goals class. No significant changes in the means of individual subscales occurred.

Results of the correlation analysis of subscales and test average show self-efficacy and test anxiety to have the strongest correlations. Specifically, the results show a strong

positive correlation between self-efficacy and test average. This could imply that students with a favorable judgment of their own ability to carry out the necessary steps to attain their goal are more likely to have higher test scores. A strong negative correlation between test anxiety and test average was found. This could imply that students that worry more about their test performance will have lower test averages. The strongest inter-correlation results are of the following:

1. A strong positive correlation was found between task value and intrinsic goal orientation. This could imply students that have a stronger mastery goal orientation will also perceive the tasks they perform in the class as being important.

2. A strong positive correlation was found between test anxiety and extrinsic goal orientation. This could imply students that have a stronger performance goal orientation will also worry more about their test performance.

3. A strong negative correlation was found between test anxiety and self-efficacy. This could imply that students with a favorable judgment of their own ability to carry out the necessary steps to attain their goal worry less about their test performance.

4. A strong positive correlation was found between control of beliefs and intrinsic goal orientation. This could imply students that have a stronger mastery goal orientation will also believe their performance is determined more by internal factors such as effort and studying rather than external factors such as the teacher.

Implications

The results of this study suggest that goal setting can potentially help lower performing students improve their test scores. Instructors should engage their students to set test performance goals for themselves, write the goals down on paper, help the students understand how to achieve the goals, understand their purpose, and read the goals on a regular basis.

Future Research

A recommendation for future research would be to further test the validity of test score improvements after goal setting as compared to before goal setting. The researcher should include a variety of developmental math classes from different times and different instructors. An analysis should be performed to measure the effects on goal setting for higher performing students compared to lower performing students.

Conclusion

Although post-treatment test results for students that received a goal setting class and participated in setting a goal for their test three results were not significantly greater than students that did not set a goal, the test scores did increase significantly after the goal compared to before while the control group's test scores did not change. The control group's test scores were higher for pre-treatment test results. The control group met at 8:00 am and this could imply that early morning classes receive better instruction from teachers as compared to subsequent classes taught by the same instructor.

APPENDICES

Appendix A

Informed Consent Document

Project Title: THE EFFECTS OF GOAL SETTING IN A DEVELOPMENTAL

ALGEBRA COURSE

Investigator: _____Richard Hunt, Academic Support _____270-780-2550

(include name, department and phone of contact person)

You are being asked to participate in a project conducted through Western Kentucky

University. The University requires that you give your signed agreement to participate in

this project.

The investigator will explain to you in detail the purpose of the project, the procedures to

be used, and the potential benefits and possible risks of participation. You may ask him

any questions you have to help you understand the project. A basic explanation of the

project is written below. Please read this explanation and discuss with the researcher any

questions you may have.

If you then decide to participate in the project, please sign on the last page of this form in

the presence of the person who explained the project to you. You should be given a copy

of this form to keep.

1.   **Nature and Purpose of the Project:**The purpose of this research is to study the
effects of goal setting in a developmental algebra class.

2.	**Explanation of Procedures:** You will be asked to complete a demographic survey and a Motivated Strategies for Learning Questionnaire (MSLQ) developed by Paul R. Pintrich. These surveys and questionnaires will be available and answered in the in the Learning Center on South Campus. I will be collecting your Math Placement Exam scores, your attendance, homework scores, quiz scores, and test scores from this class. The day after you complete your first exam following this consent, I will return to the classroom during a regularly scheduled class meeting and conduct a goal setting class that will last for one class period. Topics covered will be evidence supporting goal setting, each students' purpose behind the goal, potential roadblocks and setbacks that may be encountered, actions that can be taken to overcome them, self-esteem and self-efficacy, actions that can be taken to support the goal and a plan of action. The goal that is set will be focused on the next test. After you complete your next exam, I will again collect all attendance, homework scores, quiz scores, and test scores from this class applicable to this study.

3.	**Discomfort and Risks:** No known or foreseen risks have been identified.

4.	**Benefits:** You will potentially benefit from this research if you experience positive results from goal setting. You may potentially use the goal setting techniques to continue to do well in this class, other classes, and any other educational or personal endeavors.

5.   **Confidentiality:** The last four of your WKU ID will be obtained to track all data before and after treatment and will be obtained from the instructor. No names and the last four of the WKU ID will be collected on any one document or set of data. To protect the privacy of students under the age of 18, no student under the age of 18 shall participate in this study. If you are under the age of 18, you will be asked to return this form unsigned.

6.   **Refusal/Withdrawal:**

Refusal to participate in this study will have no effect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty.

You understand also that it is not possible to identify all potential risks in an experimental procedure, and you believe that reasonable safeguards have been taken to minimize both the known and potential but unknown risks. To protect the privacy of students under the age of 18, no student under the age of 18 shall participate in this study. If you are under the age of 18, please return this form unsigned.

_____   _____

Signature of Participant   Date

_____   _____

Witness   Date

THE DATED APPROVAL ON THIS CONSENT FORM INDICATES THAT

THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY

THE WESTERN KENTUCKY UNIVERSITY INSTITUTIONAL REVIEW BOARD

Paul Mooney, Human Protections Administrator

TELEPHONE: (270) 745-4652

Appendix B

Demographic Information

Last 4 digits of your WKU ID_____

Date: _____

1. Gender (circle one).   Male   Female

2. What year did you graduate from high school?   -

   _____

3. Class level (circle one).

Freshman   Sophomore   Junior   Senior

4. Race and ethnic background.

   Race:

           ----- American Indian or Alaska Native

           -- ---Asian

           -- ---Black or African American

           -- ---Native Hawaiian or Other Pacific Islander

           -- ---White

   Ethnicity:

-- ---Hispanic or Latino

-- ---Not Hispanic or Latino

5. How many hours per week do you work for pay?   _____

6. How many other college level courses have you

   had in this area?
   _____

7. Have you ever been enrolled in DMA 055C before?   Yes

       No

8. If yes, what was your letter grade?

       _____

9. How many total classes are you taking this semester?

       _____

10. Did you take any Algebra class in high school?   Yes

       No

11. If yes, please list the courses and their grades on the line below.

MSLQ

Motivated Strategies for Learning Questionnaire Manual

Part A. Motivation

The following questions ask about your motivation for and attitudes about this class. **Remember there are no right or wrong answers, just answer as accurately as possible.** Use the scale below to answer the questions. If you think the statement is very true of you, circle 7; if a statement is not at all true of you, circle 1. If the statement is more or less true of you, find the number between 1 and 7 that best describes you.

1	2	3	4	5	6	7
not at all true of me						very true of me

1. In a class like this, I prefer course material that really challenges me so I can learn new things.　　1　2　3　4　5　6　7

2. If I study in appropriate ways, then I will be able to learn the material in this course.　　1　2　3　4　5　6　7

3. When I take a test I think about how poorly I am doing compared with other students.　　1　2　3　4　5　6　7

4. I think I will be able to use what I learn in this course in other courses.　　1　2　3　4　5　6　7

5. I believe I will receive an excellent grade in this class.　　1　2　3　4　5　6　7

6. I'm certain I can understand the most difficult material presented in the readings for this course.　　1　2　3　4　5　6　7

7. Getting a good grade in this class is the most satisfying thing for me right now.　　1　2　3　4　5　6　7

8. When I take a test I think about items on other parts of the test I can't answer.　　1　2　3　4　5　6　7

		not at all true of me						very true of me
9.	It is my own fault if I don't learn the material in this course.	1	2	3	4	5	6	7
10.	It is important for me to learn the course material in this class.	1	2	3	4	5	6	7
11.	The most important thing for me right now is improving my overall grade point average, so my main concern in this class is getting a good grade.	1	2	3	4	5	6	7
12.	I'm confident I can learn the basic concepts taught in this course.	1	2	3	4	5	6	7
13.	If I can, I want to get better grades in this class than most of the other students.	1	2	3	4	5	6	7
14.	When I take tests I think of the consequences of failing.	1	2	3	4	5	6	7
15.	I'm confident I can understand the most complex material presented by the instructor in this course.	1	2	3	4	5	6	7
16.	In a class like this, I prefer course material that arouses my curiosity, even if it is difficult to learn.	1	2	3	4	5	6	7
17.	I am very interested in the content area of this course.	1	2	3	4	5	6	7
18.	If I try hard enough, then I will understand the course material.	1	2	3	4	5	6	7
19.	I have an uneasy, upset feeling when I take an exam.	1	2	3	4	5	6	7

45

		not at all true of me						very true of me
20.	I'm confident I can do an excellent job on the assignments and tests in this course.	1	2	3	4	5	6	7
21.	I expect to do well in this class.	1	2	3	4	5	6	7
22.	The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible.	1	2	3	4	5	6	7
23.	I think the course material in this class is useful for me to learn.	1	2	3	4	5	6	7
24.	When I have the opportunity in this class, I choose course assignments that I can learn from even if they don't guarantee a good grade.	1	2	3	4	5	6	7
25.	If I don't understand the course material, it is because I didn't try hard enough.	1	2	3	4	5	6	7
26.	I like the subject matter of this course.	1	2	3	4	5	6	7
27.	Understanding the subject matter of this course is very important to me.	1	2	3	4	5	6	7
28.	I feel my heart beating fast when I take an exam.	1	2	3	4	5	6	7
29.	I'm certain I can master the skills being taught in this class.	1	2	3	4	5	6	7
30.	I want to do well in this class because it is important to show my ability to my family, friends, employer, or others.	1	2	3	4	5	6	7
31.	Considering the difficulty of this course, the teacher, and my skills, I think I will do well in this class.	1	2	3	4	5	6	7

Part B. Learning Strategies

The following questions ask about your learning strategies and study skills for this class. Again, there are no right or wrong answers. Answer the questions about how you study in this class as accurately as possible. Use the same scale to answer the remaining questions. If you think the statement is very true of you, circle 7; if a statement is not at all true of you, circle 1. If the statement is more or less true of you, find the number between 1 and 7 that best describes you.

1	2	3	4	5	6	7
not at all true of me						very true of me

32. When I study the readings for this course, I outline the material to help me organize my thoughts.   1 2 3 4 5 6 7

33. During class time I often miss important points because I'm thinking of other things.   1 2 3 4 5 6 7

34. When studying for this course, I often try to explain the material to a classmate or friend.   1 2 3 4 5 6 7

35. I usually study in a place where I can concentrate on my course work.   1 2 3 4 5 6 7

36. When reading for this course, I make up questions to help focus my reading.   1 2 3 4 5 6 7

37. I often feel so lazy or bored when I study for this class that I quit before I finish what I planned to do.   1 2 3 4 5 6 7

38. I often find myself questioning things I hear or read in this course to decide if I find them convincing.   1 2 3 4 5 6 7

39. When I study for this class, I practice saying the material to myself over and over.   1 2 3 4 5 6 7

		not at all true of me						very true of me
40.	Even if I have trouble learning the material in this class, I try to do the work on my own, without help from anyone.	1	2	3	4	5	6	7
41.	When I become confused about something I'm reading for this class, I go back and try to figure it out.	1	2	3	4	5	6	7
42.	When I study for this course, I go through the readings and my class notes and try to find the most important ideas.	1	2	3	4	5	6	7
43.	I make good use of my study time for this course.	1	2	3	4	5	6	7
44.	If course readings are difficult to understand, I change the way I read the material.	1	2	3	4	5	6	7
45.	I try to work with other students from this class to complete the course assignments.	1	2	3	4	5	6	7
46.	When studying for this course, I read my class notes and the course readings over and over again.	1	2	3	4	5	6	7
47.	When a theory, interpretation, or conclusion is presented in class or in the readings, I try to decide if there is good supporting evidence.	1	2	3	4	5	6	7
48.	I work hard to do well in this class even if I don't like what we are doing.	1	2	3	4	5	6	7
49.	I make simple charts, diagrams, or tables to help me organize course material.	1	2	3	4	5	6	7

		not at all true of me						very true of me
50.	When studying for this course, I often set aside time to discuss course material with a group of students from the class.	1	2	3	4	5	6	7
51.	I treat the course material as a starting point and try to develop my own ideas about it.	1	2	3	4	5	6	7
52.	I find it hard to stick to a study schedule.	1	2	3	4	5	6	7
53.	When I study for this class, I pull together information from different sources, such as lectures, readings, and discussions.	1	2	3	4	5	6	7
54.	Before I study new course material thoroughly, I often skim it to see how it is organized.	1	2	3	4	5	6	7
55.	I ask myself questions to make sure I understand the material I have been studying in this class.	1	2	3	4	5	6	7
56.	I try to change the way I study in order to fit the course requirements and the instructor's teaching style.	1	2	3	4	5	6	7
57.	I often find that I have been reading for this class but don't know what it was all about.	1	2	3	4	5	6	7
58.	I ask the instructor to clarify concepts I don't understand well.	1	2	3	4	5	6	7
59.	I memorize key words to remind me of important concepts in this class.	1	2	3	4	5	6	7
60.	When course work is difficult, I either give up or only study the easy parts.	1	2	3	4	5	6	7

		not at all true of me						very true of me

61. I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying for this course. 1 2 3 4 5 6 7

62. I try to relate ideas in this subject to those in other courses whenever possible. 1 2 3 4 5 6 7

63. When I study for this course, I go over my class notes and make an outline of important concepts. 1 2 3 4 5 6 7

64. When reading for this class, I try to relate the material to what I already know. 1 2 3 4 5 6 7

65. I have a regular place set aside for studying. 1 2 3 4 5 6 7

66. I try to play around with ideas of my own related to what I am learning in this course. 1 2 3 4 5 6 7

67. When I study for this course, I write brief summaries of the main ideas from the readings and my class notes. 1 2 3 4 5 6 7

68. When I can't understand the material in this course, I ask another student in this class for help. 1 2 3 4 5 6 7

69. I try to understand the material in this class by making connections between the readings and the concepts from the lectures. 1 2 3 4 5 6 7

70. I make sure that I keep up with the weekly readings and assignments for this course. 1 2 3 4 5 6 7

71. Whenever I read or hear an assertion or conclusion in this class, I think about possible alternatives. 1 2 3 4 5 6 7

		not at all true of me						very true of me
72.	I make lists of important items for this course and memorize the lists.	1	2	3	4	5	6	7
73.	I attend this class regularly.	1	2	3	4	5	6	7
74.	Even when course materials are dull and uninteresting, I manage to keep working until I finish.	1	2	3	4	5	6	7
75.	I try to identify students in this class whom I can ask for help if necessary.	1	2	3	4	5	6	7
76.	When studying for this course I try to determine which concepts I don't understand well.	1	2	3	4	5	6	7
77.	I often find that I don't spend very much time on this course because of other activities.	1	2	3	4	5	6	7
78.	When I study for this class, I set goals for myself in order to direct my activities in each study period.	1	2	3	4	5	6	7
79.	If I get confused taking notes in class, I make sure I sort it out afterwards.	1	2	3	4	5	6	7
80.	I rarely find time to review my notes or readings before an exam.	1	2	3	4	5	6	7
81.	I try to apply ideas from course readings in other class activities such as lecture and discussion.	1	2	3	4	5	6	7

Appendix D

Optional Goal Sheet

I _____ earn the letter grade of _____ which is

anywhere from a _____% to a _____% on test number 3 in DMA 055C.

I earn this _____on test number 3 by taking the following actions:

_____

_____

_____

_____

_____

_____

_____

_____

_____.

I earn this letter grade of_____ on test number 3 because my purpose is

_____

_____

_____

_____

_____.

My purpose is strong and I believe in myself.

I understand there will be potential roadblocks and setbacks, most of which I have

control over and some that I will not have control over. I am prepared to overcome these

potential roadblocks and setbacks by maintaining a positive attitude toward my goal, believing in myself and believing in my abilities.

I will read my goal statement, the actions I will take, and my purpose every morning and every night. I will visualize achieving my goal and I will experience the feeling of success each time I read and visualize the achievement of my goal.

Signed _____ Date_____

Appendix E

Goal Reading Check Sheet

		I read my goal sheet in the morning	I visualized and could feel the achievement of my goals in the morning	I read my goal sheet in the evening	I visualized and could feel the achievement of my goals in the evening
Tuesday	10/11/2011				
Wednesday	10/12/2011				
Thursday	10/13/2011				
Friday	10/14/2011				
Saturday	10/15/2011				
Sunday	10/16/2011				
Monday	10/17/2011				
Tuesday	10/18/2011				
Wednesday	10/19/2011				
Thursday	10/20/2011				
Friday	10/21/2011				
Saturday	10/22/2011				
Sunday	10/23/2011				
Monday	10/24/2011				
Tuesday	10/25/2011				
Wednesday	10/26/2011				
Thursday	10/27/2011				
Friday	10/28/2011				
Saturday	10/29/2011				
Sunday	10/30/2011				
Monday	10/31/2011				

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